REACO Annual Membership Meeting: February 3rd, 2026
HELD AT: Jimmy's Lakeside Grill; 1320 19th Hole Dr,Windsor,CA
MEETING START TIME IS 12:00 pm

You can also join virtually through the Zoom link below.

https://us02web.zoom.us/j/89923986668?pwd=OnJS0IRKh6j349r4yT3Mnjiisy7IuV.1

CALL TO ORDER and PLEDGE OF ALLEGIANCE

SELF INTRODUCTIONS (Officers, Guests, Members)

APPROVAL OF MINUTES – January 6th, 2026

OFFICER REPORTS

President: Kevin Scheumann –

Treasurer: Betty Li –

1. Account transactions summaries
   Checking and savings beginning balance: $
   Deposits: $
   Debits and Checks: $
   Checking and savings ending balance: $

Vice President: Ryan Rose

Secretary: Rob Spaulding

Past President: Richard Angley

LIAISON REPORTS

SCFPO: Devon Gambonini –

ICC Rep: Karyn Beebe – See Link https://www.iccsafe.org/advocacy/gr-monthly-update/

CBOAC: Eric Seabrook –

CALBO: Doug Hughes –

CEC Rep: Gagandeep Randhawa –

IAEI: Doug Hughes, Mike Stone –

BayREN: John Pazos

RECSI: **Michael Wright**

ICC Region 1: Richard Angley –

COMMITTEE REPORTS

Education Committee: Eric Seabrook, David Willoughby and Kevin Scheumann –

Web-Site Committee: David Willoughby –

Scholarship Committee: David Willoughby, Richard Angley, Kris Kuntz, Ian Broeske

PROGRAM

BayREN; 2025 Energy Code Update for Multi

Family

CODE ISSUES / QUIZ –

CORRESPONDENCE AND ANNOUNCEMENTS

LEGISLATIVE NEWS

NEW BUSINESS

OLD BUSINESS

ADJOURNMENT – next meeting on March 3rd, at Jimmy's Lakeside Grill- meeting invite will be sent out later in the month for those attending virtually.

Efficiency Division Updates

CALIFORNIA ENERGY COMMISSION

ICC Chapter Monthly Meeting February 2026

Energy Code Related Updates

- **Business meeting agendas and recordings**
  - **January 21** – Approved:
    - Right-Energy Title 24 Version 2025.2.0 for Single-family buildings
    - California State Pipe Trades Council (CSPTC) as Acceptance Test Technician Certification Provider
    - Local ordinances:
    - Cities of Santa Cruz, Palo Alto, Encinitas, San Rafael: Electric readiness requirements for new single-family buildings and requirements for certain existing single-family buildings undergoing additions and alterations.
    - City of Palo Alto: New mechanical cooling system requirement for altered space conditioning systems in existing single-family homes, encouraging air source heat pumps, while still allowing air conditioners to be installed with additional efficiency measures, and introduces new electric readiness requirements for certain building types.
  - **February 11** – Potential approval of:
    - Third-party Compliance Software, Integrated Environmental Solutions Virtual Environment (IES VE) Title 24 2025.1.0 for Nonresidential buildings
    - Local ordinance:
    - Town of Corte Madera: New requirements for additions and alterations to certain existing single-family buildings - choices from a menu of energy efficiency and electrification measures.
  - **Next Business Meeting – March 12**

- **2025 Energy Code** webpage – effective January 1, 2026
- **Restructured 2025 Energy Code** available. Request feedback by May 26. CEC can provide 30-minute training
- **2025 ADU FAQS** available
- **2025 Covered processes FAQs** for commercial kitchens and controlled environmental horticulture available
- CBECC 2025.2.0 and EnergyPro 10.0 compliance software are available on the **2025 Energy Code Compliance Software webpage**
  - Older versions expired January 7, 2026

- **ECC- Providers - Energy Code Compliance Program** now in effect, webpage updated
  - For information about valid CEC-approved ECC Providers, please visit the ECC webpage or contact SCO@energy.ca.gov
- **Home Energy Rating System Providers** webpage updated
- **2028 Energy Code** pre-rulemaking to begin in 2026. Visit the **CEC 2028 Energy Code webpage**
- CBECC 2028.0.1 RV is available from the **2028 Energy Code CBECC Research Software web page**

- **Blueprint Newsletter: Fall 2025**
    - Winter 2026 to be released Feb 2026

Energy Code Training and Events

- **Energy Commission training and events**
    - Feb 4 – 2025 Single-family changes for CALBO CTI
    - Feb 6 – 2025 Significant Changes Overview for Town of Truckee
    - Feb 9 – 2025 Single-family Changes for Town of Mammoth Lakes
    - Feb 11 – 2025 Single-family Changes for Los Angeles Basin Chapter ICC
    - Feb 26 – 2025 Single-family Changes for (I-REN) Inland Regional Energy Network
- **Energy Code Ace training**
    - Feb 3 – 2025 Residential Standards: What's New
    - Feb 4 – 2025 Nonresidential Standards: What's New
    - Feb 10 – 2025 Single Family Compliance: EnergyPro Introduction
    - Feb 11 – 2025 Single Family Compliance: EnergyPro Advanced
    - Feb 12 – 2025 Nonresidential Standards: What is Acceptance Testing?
    - Feb 12 – 2025 Sigle Family Compliance: CBECC-Res Introduction
    - Feb 16 – 18 Nonresidential and Multifamily Standards for Plans Examiners
    - Feb 24 – Nonresidential Compliance: EnergyPro Introduction
    - Feb 25 – Nonresidential Compliance: EnergyPro Advanced
- **BayREN training**
    - Feb 11 – 2025 Energy Code Changes – Nonresidential
    - Feb 25 – ECC (formerly HERS) Registry
- **3C-REN training**
    - Feb 4 – 2025 Energy Code in Practice: Single Family Residential
    - Feb 10 – 2025 California Energy Code & Passive House
    - Feb 18 – Builders Perspective: Heat Pump Water Heaters
- **I-REN training**
    - Feb 12 – Introduction to Energy Code (2025 Code)
- **SoCal REN resources**
- **PG&E training**
- **Southern California Edison training**
- **SoCal Gas education**

Energy Code Resources

- **Energy Code Support Center**
- Energy Code Hotline: call 800-772-3300 or use **hotline submission form**
- **2022 Energy Code Compliance Software**
- **Local Energy Code resources**
- **CalGreen resources**
- **Building and Home Energy Resource Hub**
- **Inflation Reduction Act Residential Energy Rebate Programs**
- **2028 Energy Code - Codes and Standards Enhancement (CASE)**
- **Energy Code Compliance Study** – Email **SCO@energy.ca.gov** **https://forms.office.com/g/XtPD0SEdiP**

Receive regular updates via email

- **Blueprint Newsletter email list**
- **Building Standards email list**
- **Appliance Standards email list**
- **Federal IRA Residential Incentives email list**

BayREN Codes & Standards Program

2026 BayREN Energy Code Trainings & Events

https://www.bayren.org/events-training

Live Online Events & Trainings

BayREN C&S Training: 2025 Energy Code Changes – Nonresidential

Location: live online
Date: Wednesday, February 11, 2026
Time: 9:00 am –10:30 am
Description: This course will provide an overview of the 2025 Energy Code changes for nonresidential buildings, including changes to mandatory measures, new compliance forms, as well as updated performance and prescriptive requirements.
Topics Covered: Energy Code, Nonresidential
Target Audience: Building Department Staff
ICC CEUs: 0.1
Webinar Registration Link

BayREN C&S Training: ECC (formerly HERS) Registry

Location: live online
Date: Wednesday, February 25, 2026
Time: 9:00 am –10:30 am
Description: This course explores the advantages of using the online Energy Code Compliance (ECC) registry, formerly known as Home Energy Rating System (HERS), to track and verify compliance forms electronically and will cover how to navigate projects in the ECC registry.
Topics Covered: Energy Code, ECC Registry, HERS Registry
Target Audience: Building Department Staff
ICC CEUs: 0.1
Webinar Registration Link

BayREN C&S Training: Residential New Construction

Location: live online
Date: Tuesday, March 10, 2026
Time: 9:00 am –10:30 am
Description: This course provides a basic review of Energy Code requirements for residential new construction and larger additions, compliance processes and documentation, and instructions for plan checking in the context of the 2025 Energy Code.
Topics Covered: Energy Code, Residential, New Construction
Target Audience: Building Department Staff
ICC CEUs: 0.1
Webinar Registration Link

Energy Code Ace 2026 Title 24, Part 6 Trainings

2025 Title 24, Part 6 Essentials — Nonresidential Standards: What's New

Location: live online
Date: Wednesday, February 4, 2026
Time: 8:30 am –11:00 am
Description: This online live event summarizes the new and revised requirements in the 2025 California Building Energy Efficiency Standards (Title 24, Part 6 or Energy Code) for nonresidential buildings, and directs participants to informational resources and training that provide more in-depth information on the Energy Code. Join us to begin learning what the 2025 code means to you and your customers.
Topics Covered: Energy Code, Nonresidential
Target Audience: Building Department Staff
ICC CEUs: 0.25
Webinar Registration Link

2025 Title 24, Part 6 Essentials — Nonresidential Standards: What is Acceptance Testing?

Location: live online
Date: Thursday, February 12, 2026
Time: 9:00 am –12:00 pm
Description: What is Acceptance Testing? How does it compare to Commissioning? What Nonresidential HVAC systems require a certified Acceptance Test Technician under the 2025 California Energy Code? Who's involved and how is it documented? This three-hour online live class addresses these questions and more, with an overview of Energy Code Acceptance Testing requirements for a variety of systems, and a focus on Nonresidential HVAC systems.
Topics Covered: Energy Code, Nonresidential
Target Audience: Building Department Staff
ICC CEUs: 0.25
Webinar Registration Link

For information about BayREN resources and trainings contact John Pazos, Sonoma County BayREN Codes and Standards Program Representative: John.Pazos@sonomacounty.gov or 707-565-3029.

Redwood Empire Association of Code Officials (REACO)
President Kevin Scheumann
1007 West College Avenue, Box 326
Santa Rosa, CA 95401

BUDGET WORKSHEET FOR CALENDAR YEAR 2026

Budget Worksheet Prepared 1/26/2026

ACCOUNTS

Checking on 1/1/25 =	$7,932.12
Savings on 1/1/25=	$15,394.90
CD-8075 (7 mo) on 1/1/25 =	$13,220.18
CD-8088 (13 mo) on 1/1/25 =	$13,225.79
Total 2025 =	**$49,772.99**

Checking on 12/31/25 =	$2,461.92
Savings on 12/31/25=	$5,397.11
CD-7738 (7 mo) on 12/31/25 =	$10,316.71
CD-8075 (7 mo) on 12/31/25 =	$13,769.62
CD 8088 (7 mo) on 12/31/25 =	$13,654.83
Total 2026 =	**$45,600.19**

	Budget for 2025	Actual 2025	Difference Budget/Actual	Proposed Amount Change	Notes	Proposed Budget for 2026
REVENUE						
Career Succession Classes	$13,000	$2,264	-$10,736	-$4,000		$9,000
Membership Dues	$2,500	$1,579	-$921	$0	No Change	$2,500
Lunch Meetings	$3,000	$2,237	-$763	$0	No Change	$3,000
ICC PP	$1,200	$1,800	$600	$600		$1,800
Interest (From Savings/CDs)	$1,200	$1,298	$98	$0	No Change	$1,200
Total Revenue	$20,900	$9,178	-$11,722	-$3,400		**$17,500**
EXPENDITURES						
Career Succession Classes	$4,000	$2,722	$1,278	$0	No Change	$4,000
Donations/Chapter Outreach	$2,000	$1,000	$1,000	$0	*CBOAC, High school & college classes*	$2,000
Executive Board	$0	$0	$0	$0	No Change	$0
Lunch Meeting for members	$3,000	$2,386	$614	$0	No Change	$3,000
Lunch Meeting for officers	$500	$146	$354	$0	No Change	$500

Memberships & Dues	$300		$300	$0	No Change	$300
Professional Processing Fees	$100		$100	$0	No Change	$100
Professional Fees Website	$1,200	$432	$768	$0	No Change	$1,200
Professional Fees Legal and Accounting	$1,300	$834	$466	$0	No Change	$1,300
Office Supplies & Post box rental	$1,300	$1,030	$270	$0	No Change	$1,300
Scholarships	$3,000	$3,000	$0	$0	No Change	$3,000
Total Expenditures	$16,700	$11,550	$5,150	$0		**$16,700**

2025 Energy Code Changes – Multifamily

BayREN Training

Handouts

1. 2025 California Energy Code Fact Sheet - CEC

2. 2025 Energy Code Fact Sheet Summary - Multifamily Buildings: What's New in 2025? ECA

3. 2025 Energy Code Fact Sheet - Multifamily Buildings: What's Changed in 2025? ECA

Handout 1:

2025 California Energy Code Fact Sheet

California Energy Commission

CALIFORNIA ENERGY COMMISSION

2025 California Energy Code FACT SHEET

The Energy Code Background

As California's primary energy policy and planning agency, the California Energy Commission (CEC) was mandated by the Warren-Alquist Act to update and adopt building standards that reduce wasteful, uneconomic, inefficient, or unnecessary energy consumption and reduce greenhouse gas (GHG) emissions. That's because homes and businesses use nearly 70 percent of California's electricity! They are also responsible for about 25 percent of the state's GHG emissions. Every three years, the CEC updates the Energy Code, which is published by the California Building Standards Commission as part of the California Building Standards Code (itself, known as Title 24 of the California Code of Regulations). The CEC's efficiency standards for buildings and appliances together have saved Californians more than $100 billion in avoided energy costs over the last 50 years. Thanks to efficiency measures, California — the U.S. state with the highest population and largest economy (almost $3.9 trillion GDP in 2023) — has the second-lowest per capita energy use in both the residential and commercial sectors.[1]

Meeting State Climate Goals Through Better Buildings for Californians

The Energy Code governs the energy-saving features of newly constructed buildings, building additions, and alterations to existing buildings. The standards for 2025 are cost-effective and are estimated to provide over $4.8 billion in statewide energy cost savings over 30 years.

The 2025 updates strongly contribute to California's efforts to "decarbonize" its buildings: reducing their carbon emissions. The Energy Code reduces emissions by making buildings more energy efficient; encouraging the use of energy efficient heat pumps for space and water heating; using clean energy generated onsite by solar panels in combination with battery storage; and shifting times of energy use to avoid peak periods of the day when dirty and inefficient powerplants are supplying more power to the grid.

The 2025 Energy Code Update Focuses on:

- Expanding the use of heat pumps for space conditioning and water heating in newly constructed single-family, multifamily, and select nonresidential buildings. The standards also allow for flexibility in taking alternative but equally efficient approaches.
  - ◊ For homes, use heat pumps for both space heating and water heating, expanding on the single heat pump baselines in the 2022 update.
  - ◊ For nonresidential building types, expanding on the single-zone heat pump baselines in the 2022 update.
  - ◊ For low-rise multifamily buildings with individual water heaters in dwelling units, use heat pump water heater baselines, expanding on the space heating heat pump baselines in the 2022 update.
- Encouraging electric-ready buildings to set up owners to use cleaner electric water heating and cooking when they are ready to invest in those technologies.
- Updating photovoltaic and battery energy storage system standards for high-rise multifamily and nonresidential buildings to achieve cost effective installations in consideration of revised net billing and virtual net billing rules.
- Updating space conditioning system control standards for nonresidential buildings.
- Updating ventilation requirements in multifamily buildings to improve indoor air quality.

Reminder: The CEC does not mandate specific fuel types. California's Energy Code is founded on the principle of enabling building designers to use a range of options for complying with energy requirements.

[1] US Energy Information Administration

Process and Timeline

The Energy Code measures are updated with extensive input from the public, many stakeholders, and experts who participate in the CEC's process. Over the course of each three-year cycle, CEC staff and technical consultants evaluate each measure. The standards must be technologically feasible and cost-effective over the life of the building. The measures are discussed in public workshops and in online comments before being revised. This year, the standards were adopted at the September 11 CEC business meeting and will go to the California Building Standards Commission for approval as part of California's Building Standards Code before the end of 2024.

After approval, there is a one-year period for the CEC to provide supporting information, training, and technical assistance that brings builders, code officials, and technicians up to speed on the updates before they take effect. Local building departments start enforcing the 2025 Energy Code on January 1, 2026. These measures not only save energy and reduce energy bills, but also help Californians breathe easier and be more comfortable where they live and work. They are a critically important tool for advancing the state's climate and energy goals.

BY THE NUMBERS

$100 BILLION

avoided energy costs over the last 50 years from the CEC's efficiency standards for buildings and appliances

70% amount of California's electricity used by homes and businesses

25% amount of the state's total greenhouse gas (GHG) emissions that homes and businesses are responsible for

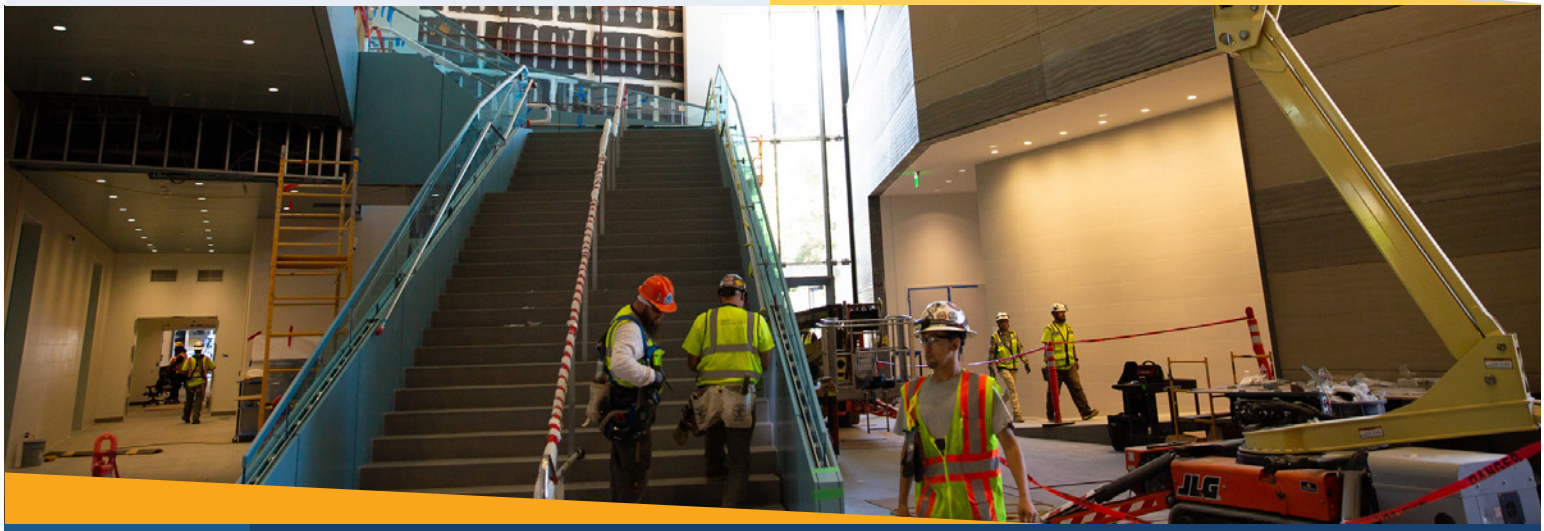
$4.8 BILLION

statewide energy cost savings expected from the standards for 2025

For more information on:

The current Energy Code updates, please go to www.energy.ca.gov/2025EnergyCode

Please direct media questions to mediaoffice@energy.ca.gov



September 2024

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Handout 2:

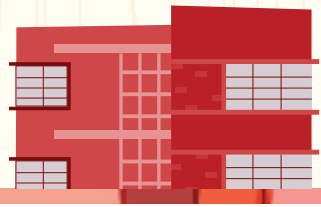
2025 Energy Code Fact Sheet

Multifamily Buildings: What's New in 2025?

Energy Code Ace

Ace Resources™

Multifamily Buildings
What's New in 2025?



Using this Fact Sheet

Use this fact sheet for highlights on the ways in which California's 2025 Building Energy Efficiency Standards (Energy Code or Title 24, Part 6) has changed in 2025 for multifamily buildings. For details about the Energy Code changes, refer to the What's Changed in 2025: Multifamily Buildings Fact Sheet.

Highlights and details about the code changes for other building types are given in the following fact sheets:

- Single-family Buildings: What's New in 2025?
- Single-family Buildings: What's Changed in 2025?
- Nonresidential Buildings: What's New in 2025?
- Nonresidential Buildings: What's Changed in 2025?

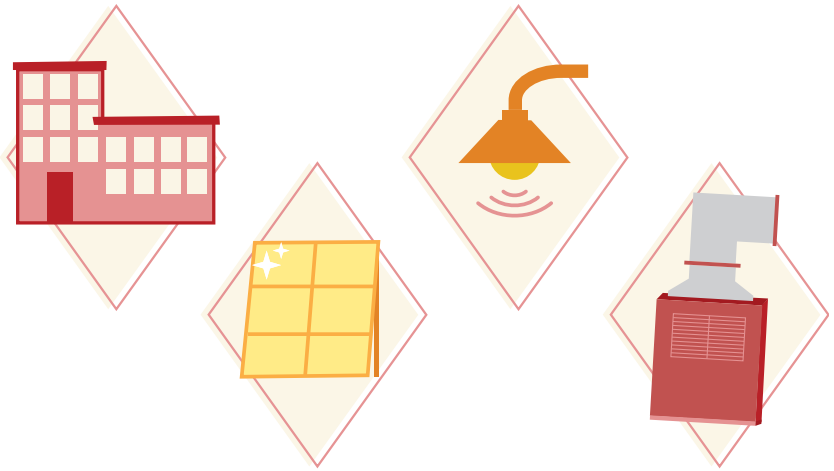


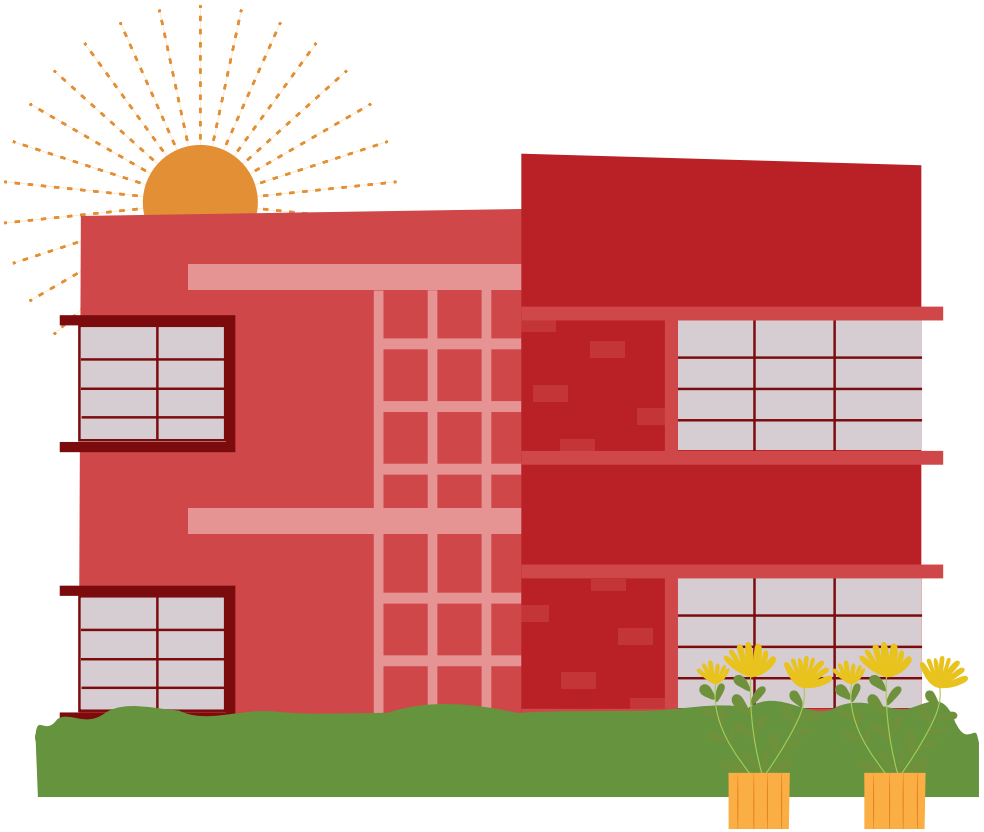
Table of Contents

What's Included:

The 2025 Energy Code updated the 2022 Energy Code.

The 2025 Energy Code is effective as of January 1, 2026. Any projects that apply for a permit on or after this date will be subject to the 2025 Energy Code. Information and documents are available on the California Energy Commission (CEC) website.

This fact sheet highlights the key changes to the Energy Code that apply to multifamily buildings. All measures apply to all multifamily buildings unless otherwise noted. There are separate requirements for dwelling units and common use areas.



Defining Multifamily Spaces

Dwelling Unit: A single unit providing complete, independent living facilities for one or more persons including access and permanent provisions for living, sleeping, eating, cooking, and sanitation

Common Use Areas: Occupancy "R" spaces that do NOT include dwelling units, such as community rooms, corridors, laundry rooms serving multiple units, lobbies, lounges, and storage spaces that only serve a multifamily "R" occupancy. Common use areas do NOT include any of these spaces serving a nonresidential building occupancy.

Generally, multifamily buildings in the Energy Code are buildings with three or more dwelling units, excluding townhouses, which are defined as single-family. The 2025 Energy Code defines a multifamily building as a building in one of the following groups:

- Occupancy Group R-2, other than a hotel or motel building or timeshare property
- Occupancy Group R-3 that is a non-transient congregate residence, other than boarding houses with more than six guests and alcohol or drug abuse recovery homes with more than six guests
- Occupancy Group 4

Residential Occupancy Groups R-2, R-3, and R-4 are set by the California Building Code (Title 24, Part 2) independently of the Energy Code (Title 24, Part 6):

- R-2 includes buildings with sleeping units or three or more dwelling units with primarily permanent residents.
- R-3 overall includes single-family and duplex residences, but R-3 also includes some multifamily congregate residences with primarily permanent residents, such as dormitories.
- R-4 covers supervised residential environments for more than six ambulatory clients and up to 16 total residents, excluding staff. R-4 includes assisted living facilities such as residential care facilities and group homes and social rehabilitation residences such as halfway houses and drug treatment facilities.

Building Occupancies Subject to the Energy Code: Multifamily

The following Energy Code building types, and their Occupancy class per the California Building Code, are subject to the Energy Code.

Multifamily Groups

Referred to as "Multifamily Buildings" in the Energy Code

Occupancy Class: R2 — Residential

Buildings with three or more dwelling units for permanent residents, excluding townhouses.

Occupancy Class: R3 — Residential

Multifamily congregate residences with primarily permanent residents. This can include Accessory Dwelling Units (ADUs) on a multifamily property.

Occupancy Class: R4 — Residential

Supervised residential environments for more than six ambulatory clients and up to 16 total residents, that is not considered a "Healthcare Facility."

Occupancy Class: U — Miscellaneous

Accessory buildings and structures, and miscellaneous structures not classified in any specific occupancy and on a multifamily property.

Note: See the "Trigger Tables" in our fact sheets for specific scopes of work that trigger the Energy Code, and review the Triggering Energy Code Requirements fact sheets for more information on building occupancies.

Why Did the Energy Code Change?

The 2025 Energy Code is an important part of California's work to **reduce carbon emissions** and **fight climate change**. The Energy Code is updated every three years with the mandate to increase building energy efficiency while staying cost-effective for building owners over the lifespan of a building.

Expected Benefits of the 2025 Energy Code Across All Building Types:

- Save $4.8 billion in energy costs
- Drive 500,000 heat pump installations in the first three years
- Save enough water to fill 100 Olympic-sized swimming pools annually
- Reduce greenhouse gas (GHG) emissions by four million metric tons

Decarbonization Goals

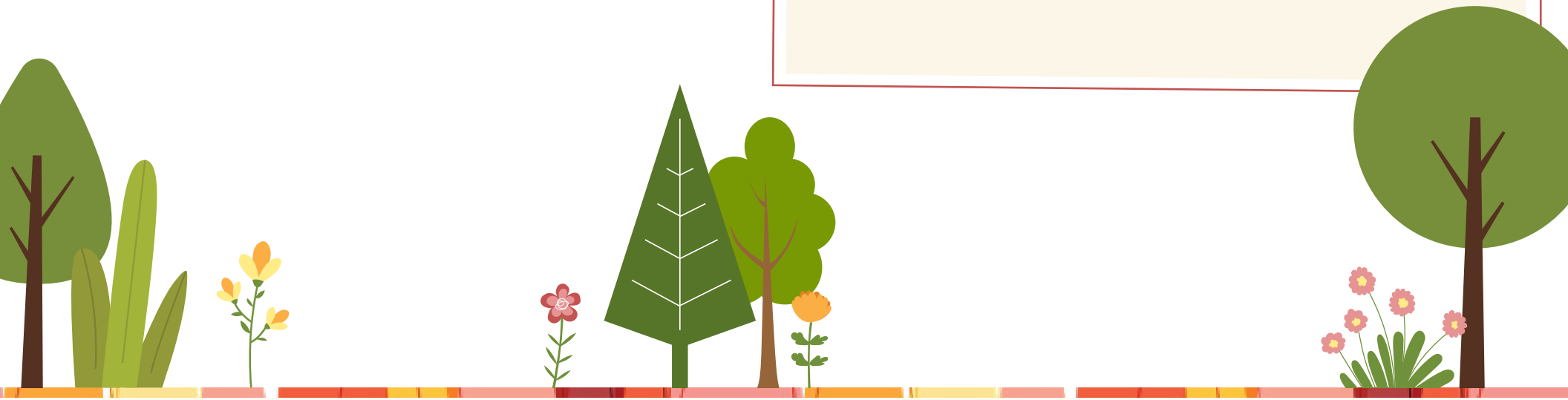
California aims to reduce its GHG emissions while creating an energy system that is resilient to climate risks, spurring innovation and a low-carbon transition both nationally and internationally. Per the CEC Energy Assessment, California has some of the most ambitious climate and energy goals in the world.

GHG Emission Reduction Goals

1. Assembly Bill 32: 1990 levels by 2020
2. Senate Bill 32: 40% below 1990 levels by 2030
3. Executive Order S-3-05: 80% below 1990 levels by 2050

This can be achieved through a variety of measures, such as incremental steps toward "carbon neutral" buildings, and timely balancing of onsite energy production and consumption in support of a healthy, stable grid. The Energy Code supports reaching these goals.

Learn more from the CEC Building Decarbonization Assessment



Evolving Energy Code Compliance Metrics

The 2025 Energy Code updates the energy compliance metrics that are the basis of the Performance Approach from those used in the 2022 Energy Code (see Table 1). In the 2022 Energy Code, multifamily New Construction had to show compliance with Source Energy (Source), Time Dependent Valuation (TDV) energy budgets for energy efficiency (TDVe), and a total (TDVt) that combined energy efficiency with photovoltaics (PV or solar electricity) and flexibility measures. Additions and Alterations were also required to meet TDV energy budgets.

The terminology and units in the 2025 Energy Code have changed to Source Energy (Source), Long-term System Cost (LSC) for energy efficiency (LSCe) and for a total (LSCt) that includes energy efficiency measures plus PV and flexibility measures. In the 2025 Energy Code, Additions and Alterations show compliance using LSCe alone. See Table 2 and the definitions of Source Energy and Long-term System Costs under Key Terms for more details.

This change to assessing multifamily buildings using LSC is intended to give an idea of how the energy and carbon efficiency of current building construction will impact California's energy systems over the next 30 years. **Note that LSC does not predict individual utility bills**.

Table 1: Evolving Energy Code Compliance Metrics for Multifamily Construction

Energy Code	New Construction	Additions	Alterations
2022	Source, TDVe, TDVt	TDV	TDV
2025	Source, LSCe, LSCt	LSCe	LSCe

2022: Source = Total Annual Source Energy; **TDV** = Time Dependent Valuation; **TDVe** = Efficiency TDV; **TDVt** = Total TDV

2025: Source = Total Annual Source Energy; **LSCe** = Efficiency LSC; **LSCt** = Total LSC

Table 2: Source Energy and Long-term System Cost as Compliance Metrics

Source Energy (Source)	Efficiency Long-Term System Costs (LSCe)	Total Long-term System Costs (LSCt)
A score representing the building **long run source energy use due to fossil fuel combustion expressed as an hourly source-carbon metric**. Source Energy includes: ✦ Envelope ✦ Indoor fans ✦ HVAC ✦ DHW ✦ PV ✦ Batteries ✦ Other loads	A score representing the **building energy efficiency expressed as long-term system costs**. Efficiency LSC includes: ✦ Envelope ✦ Indoor fans ✦ HVAC ✦ DHW ✦ Other loads, including self-utilization credit and indoor lighting when applicable	A score representing the building **long-term system costs for energy efficiency while also factoring in PV and flexibility**. Total LSC includes: ✦ Efficiency measures ✦ PV ✦ Batteries ✦ Precooling

PV = Solar photovoltaics, **HVAC** = Heating, ventilation, and air conditioning, **DHW** = Domestic hot water

Important Note: For New Construction, a building complies with the Performance Approach ONLY if **all three** compliance scores are met, which means that each Proposed Design score is **lower than or equal to** the Standard Design score.

Key Terms

Mandatory Requirements: The Energy Code includes Mandatory requirements for multifamily building features and systems that must be met regardless of the overall compliance approach (§§160.0 through 160.9).

Prescriptive Approach: The Prescriptive Approach — a set of prescribed performance levels for various building components, where each component must meet or exceed specific requirements — is considered the most direct path to Energy Code compliance. There are different multifamily Prescriptive requirements for different Climate Zones (CZs) and for New Construction (§170.2) or Additions (§180.1(a)) versus Alterations (§180.2(b)). The Performance Approach allows for more flexibility than the Prescriptive requirements.

Performance Approach: The Performance Approach (§170.1 for New Construction, §180.1(b) for Additions, and §180.2(c) for Alterations) builds on the Prescriptive Approach by allowing energy allotments to be traded between building systems for multifamily buildings. There can be proposed energy use trade-offs between features of the building envelope, domestic water-heating, space-heating, and space-cooling equipment. A building complies with the Performance Approach if the energy consumption calculated for the Proposed Design building is less than or equal to the energy budget calculated for the Standard Design building using energy analysis software that has been approved by the CEC.

Performance Approach Terms

- **Long-term System Cost (LSC):** CEC-projected present value of costs to California's energy systems over a period of 30 years in units of dollars per square foot of conditioned floor area ($/ft²). **Note that even though the units are in $/ft², LSC does not predict individual utility bills.** Using the LSC metric ensures that all modeled building features are specified on a one-for-one equivalent energy use or equivalent energy cost basis. LSC consists of large data sets that convert electricity, gas, and propane to LSC energy. The rate of conversion varies for each hour of the year, CZ, energy type (electricity, natural gas, and propane), and building type (low-rise residential including multifamily, high-rise residential, nonresidential, and hotel and motel).
- **Self-utilization Credit:** The limited Efficiency LSC energy budget compliance credit available for combined PV and battery energy storage systems for single-family buildings, as specified by the Residential ACM Reference Manual, and low-rise multifamily, as specified by the Nonresidential and Multifamily ACM Reference Manual.
- **Source Energy (Source):** The long run marginal source energy of fossil fuels that are combusted as a result of building energy consumed either directly at the building site or to meet the electrical demand of the building. The source energy metric considers the long-term marginal hourly resources of CEC-projected electric system resource procurement. For a given hour, the value in that hour for each forecasted year is averaged to get a lifetime average source energy measured in kBtu/ft²-yr.
- **Time Dependent Valuation (TDV):** "TDV Energy" is the time varying energy used by the building to provide space conditioning, water heating, and specified building lighting. It accounts for the energy used at the building site and consumed in producing and delivering energy to a site, including, but not limited to, power generation, transmission, and distribution losses.

Photovoltaics (PV): A system that generates electricity from solar energy.

Terminology Change: "HERS" Is Now "ECC"

California's Energy Code requires that third-party special inspectors perform field verification and diagnostic testing of certain installed building features and systems. Through the 2022 Energy Code cycle, these special inspectors were called Home Energy Rating System (HERS) Raters, and HERS program requirements were covered in California's Title 20 Appliance Efficiency Regulations.

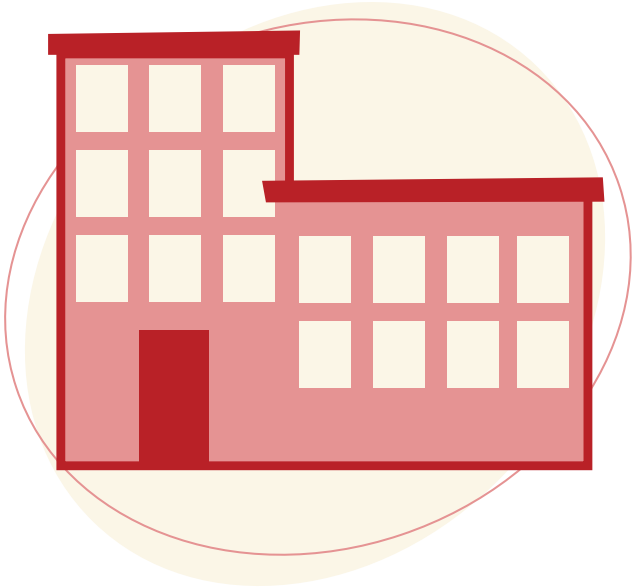
For the 2025 code cycle, the HERS program has been renamed the Energy Code Compliance (ECC) program, and the ECC program requirements have been moved from Title 20 to Title 24, Part 1, §10-103.3. HERS Raters will now be known as ECC-Raters. See Table 3 for a summary of the new terminology with updated definitions.

Table 3: Home Energy Rating System (HERS) Renamed "Energy Code Compliance (ECC)" Program

Through 2022 Energy Code Cycle	Starting 2025 Energy Code Cycle	Definition
HERS	ECC	✦ ECC = **Energy Code Compliance Program** ✦ Confirms compliance with Energy Code via field verification and diagnostic testing as applicable in **Residential** construction: » New Construction » Additions » Alterations ✦ Program requirements moved from Title 20 to Title 24, Part 1
HERS Provider	ECC-Provider	✦ An **organization** approved by the CEC to administer the ECC program per Energy Code §10-103.3
HERS Rater	ECC-Rater	✦ A **person** trained, tested, and certified by an ECC Provider ✦ Performs ECC field verification and diagnostic testing
N/A	ECC-Rater Company	✦ An **organization** certified by an ECC-Provider ✦ Offers field verification and diagnostic testing services by the ECC Rater Company's ECC Raters
HERS Measures	ECC Measures	✦ Building feature installations that must demonstrate compliance with Energy Code via field verification and diagnostic testing

Envelope Highlights

Key Envelope Terms



Relative Solar Heat Gain Coefficient (RSHGC): The ratio of solar heat gain through a fenestration product (corrected for external shading) to the incident solar radiation. Solar heat gain includes directly transmitted solar heat and absorbed solar radiation, which is then reradiated, conducted, or convected into the space.

Solar Reflectance: The ratio (expressed as a decimal) of solar heat that is reflected compared to the incident solar radiation. The higher the solar reflectance rating, the more solar heat is reflected.

Solar Reflectance Index (SRI): A measure of the roof's ability to reject solar heat which includes both reflectance and emittance. The higher the SRI, the more solar heat is rejected.

Thermal Emittance: Material that reflects the sun's energy will still absorb some of that energy as heat. That absorbed heat is given off (emitted) to the environment in varying amounts depending on the materials and surface types. This emittance is given a value between 0 and 1, and this value represents a comparison (ratio) between what a given material or surface emits and what a perfect blackbody emitter would emit at the same temperature. A higher emittance value means more energy is released from the material or surface. Emittance is a measure of the relative efficiency with which a material, surface, or body can cool itself by radiation.

U-factor: The overall coefficient of thermal transmittance of a fenestration, wall, floor, or roof and ceiling component, in Btu/(hr × ft² × °F), including air film resistance at both surfaces.

Visible Transmittance (VT): The ratio (expressed as a decimal) of visible light that is transmitted through a glazing fenestration. The higher the VT rating, the more light is allowed through a window.

New Construction

Wall U-factor and Insulation

› **Mandatory**

› **Section 160.1(b)**

The 2025 Energy Code tightens maximum overall assembly U-factor requirements for 2x4 and 2x6 wood framed walls that separate conditioned space from either enclosed unconditioned space or outdoor air:

Wood framed walls:

- 2x4 framed walls must have a maximum area-weighted assembly U-factor less than or equal to 0.095, reduced from 0.102.
- 2x6 framed walls must have a maximum assembly U-factor less than or equal to 0.069, reduced from 0.071.
- Wood-framed walls with 16 inch on center framing can meet these new U-factor requirements by installing at least R-15 insulation in 2x4 assemblies or R-21 insulation in 2x6 assemblies.

Metal framed walls:

- Metal framed walls must have a maximum area-weighted average assembly U-factor of 0.151, increased from 0.148.

Note that the Mandatory maximum assembly U-factors have not changed for metal buildings, light mass walls, heavy mass walls, spandrel panels and curtain walls, demising walls, or for other wall assemblies not specifically included in §160.1(b).

Mandatory Maximum Fenestration U-factor

› **Mandatory**

› **Section 160.1(e)**

The Mandatory maximum area-weighted average U-factor for fenestration products, including skylights, which separate conditioned space from unconditioned space or outdoors remains at 0.58, but there are some updated exceptions to the requirement.

The Mandatory maximum 0.58 U-factor is **NOT** required for the following:

- A fenestration area up to 0.5 percent of conditioned floor area
- Up to 30 ft² of dual-glazed greenhouse or garden windows per dwelling unit
- New for the 2025 Energy Code: Fenestration installed to meet Part 7 of the California Building Code in buildings located in Fire Hazard Severity Zones or Wildland-Urban Interface (WUI) Fire Areas

Prescriptive Cool Roof Updates

› **Prescriptive**

› **Section 170.2(a)1A, Table 170.2-A**

Table 170.2-A of the 2025 Energy Code increases Prescriptive cool roof requirements in some CZs for steep-sloped roofs over Option B high performance vented attics and for low-sloped roofs for Option D non-attic roof assemblies.

For the 2025 Energy Code, Option B steep-sloped roof requirements in CZs 10, 11, 13, and 15 increase:

- Minimum aged solar reflectance from 0.20 to 0.25
- Minimum solar reflectance index from 16 to 23

Option D low-sloped roofs in CZs 2, 4, 6, 7, 8, and 12 did not require cool roofs in the 2022 Energy Code. For the 2025 Energy Code those roofs must have:

- Aged solar reflectance ≥ 0.63
- Thermal emittance ≥ 0.75
- Solar reflectance index ≥ 75

Prescriptive Slab Floor Insulation

› **Prescriptive**

› **Section 170.2(a)5B, Table 170.2-A**

§170.2(a)5B and Table 170.2-A of the 2025 Energy Code expand CZ 16 slab-on-grade perimeter insulation requirements to multifamily buildings with any number of habitable stories. The Prescriptive insulation requirement changed from a U-factor of 0.58 to an F-factor of 0.58.

The slab insulation requirement can still be met with R-7 perimeter insulation with 16" depth or the depth of the building footing, whichever is less. See Joint Reference Appendix JA4, Table 4.4.7, for other slab perimeter insulation R-value and depth options that meet the 0.58 F-factor.

Prescriptive Fenestration Updates

› **Prescriptive**

› **Section 170.2(a)3, Table 170.2-A**

The 2025 Energy Code removes some separate Prescriptive fenestration requirements for new buildings with three stories or less versus four stories or more. In the 2025 Energy Code, the same Prescriptive fenestration U-factor, RSHGC, and VT requirements for different fenestration types apply to multifamily buildings with any number of habitable stories (see Table 4, excerpted from Table 170.2-A).

In another change, the 2025 Energy Code clarifies that VT requirements apply to common use areas but not to dwelling units.

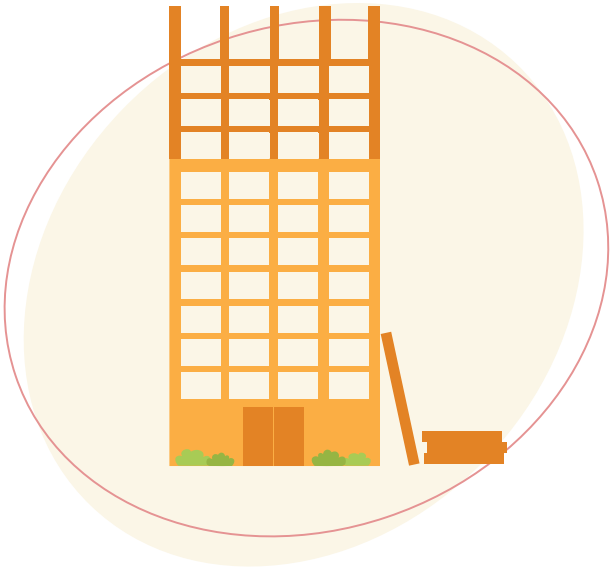


Table 4: Multifamily Prescriptive Fenestration Maximum Area-weighted Average U-factor, Relative Solar Heat Gain Coefficient, and Visible Transmittance by Fenestration Type and CZ (Adapted from Table 170.2-A)

Fenestration Type and Feature	CZ1	CZ2	CZ3	CZ4	CZ5	CZ6	CZ7	CZ8	CZ9	CZ10	CZ11	CZ12	CZ13	CZ14	CZ15	CZ16
Curtain Wall, Storefront[1]: Maximum U-factor	0.38	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.38
Curtain Wall, Storefront[1]: Maximum RSHGC	NR	0.26	NR	0.26	NR	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.25	0.26	NR
Curtain Wall, Storefront[1]: Minimum VT, Common Use Areas NEW!	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
NAFS 2017 Performance Class AW[2]: Maximum U-factor	0.38	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.38
NAFS 2017 Performance Class AW[2]: Maximum RSHGC	NR	0.24	NR	0.24	NR	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	NR
NAFS 2017 Performance Class AW[2]: Minimum VT, Common Use Areas NEW!	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
All Other Fenestration: Maximum U-factor	**0.28 NEW!**	0.30	**0.28 NEW!**	**0.28 NEW!**	**0.28 NEW!**	0.34	0.34	**0.30 NEW!**	0.30	0.30	**0.28 NEW!**	0.30	**0.28 NEW!**	**0.28 NEW!**	**0.28 NEW!**	**0.28 NEW!**
All Other Fenestration: Maximum RSHGC	NR	0.23	NR	0.23	NR	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	NR

[1] Requirements also apply to doors included in the curtainwall or storefront construction assembly.

[2] Product must be certified to meet the North American Fenestration Standard/Specification for an Architectural Window (AW).

CZ = Climate Zone, **NEW!** = Updated for 2025 Energy Code, **NR** = Not required

Alterations

Fenestration Alterations

› **Prescriptive**

› **Section 180.2(b)1C, Table 180.2-B**

The 2025 Energy Code removes RSHGC requirements for vertical fenestration alterations in CZs 1, 3, 5, and 16. The 2025 Energy Code also removes SHGC requirements for skylight alterations in CZs 1, 3, 5, and 16 (see Table 5 adapted from Table 180.2-B).

Table 5 also shows that the same Prescriptive fenestration U-factor and RSHGC requirements for skylights apply to multifamily buildings with any number of habitable stories, rather than having separate requirements for buildings with three stories or less versus four stories or more.

In another change, the 2025 Energy Code clarifies that visible transmittance (VT) requirements for skylights apply to common use areas but not to dwelling units.

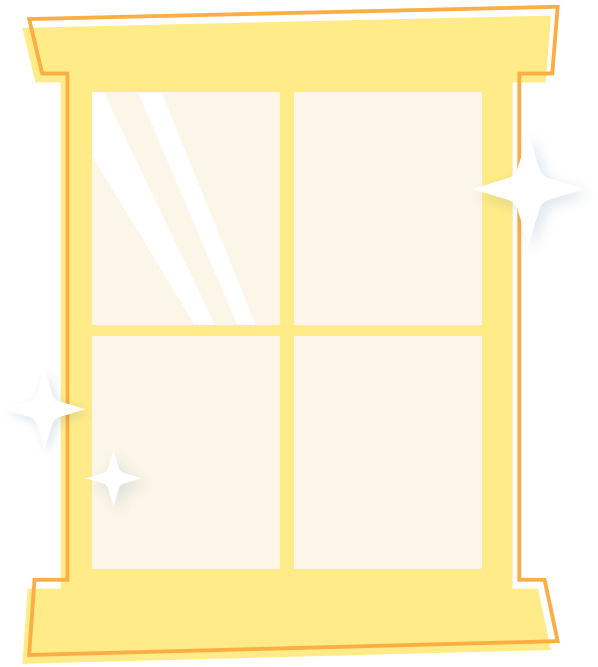


Table 5: Multifamily Prescriptive Fenestration Alteration Requirements (Adapted from Table 180.2-B)

Fenestration Type and Feature	CZ1	CZ2	CZ3	CZ4	CZ5	CZ6	CZ7	CZ8	CZ9	CZ10	CZ11	CZ12	CZ13	CZ14	CZ15	CZ16
Curtain Wall, Storefront[1]: Maximum U-factor	0.38	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.38
Curtain Wall, Storefront, Window Wall[1]: Maximum RSHGC	**NR** NEW!	0.26	**NR** NEW!	0.26	**NR** NEW!	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	**NR** NEW!
Curtain Wall, Storefront, Window Wall[1]: Minimum VT[2]	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
NAFS 2017 Performance Class AW Fixed: Maximum U-factor	0.38	0.38	0.38	0.38	0.38	0.47	0.47	0.41	0.41	0.38	0.38	0.38	0.38	0.38	0.38	0.38
NAFS 2017 Performance Class AW - Fixed: Maximum RSHGC	**NR** NEW!	0.25	**NR** NEW!	0.25	**NR** NEW!	0.31	0.31	0.26	0.26	0.25	0.25	0.25	0.25	0.25	0.25	**NR** NEW!
NAFS 2017 Performance Class AW - Fixed: Minimum VT[2]	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
NAFS 2017 Performance Class AW - Operable: Maximum U-factor	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
NAFS 2017 Performance Class AW - Operable: Maximum RSHGC	**NR** NEW!	0.24	**NR** NEW!	0.24	**NR** NEW!	0.31	0.31	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	**NR** NEW!
NAFS 2017 Performance Class AW - Operable: Minimum VT[2]	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
All Other Windows and Glazed Doors: Maximum U-factor	**0.28** NEW!	0.30	**0.28** NEW!	**0.28** NEW!	**0.28** NEW!	0.30	0.34	0.30	0.30	0.30	**0.28** NEW!	0.30	**0.28** NEW!	**0.28** NEW!	0.30	**0.28** NEW!
All Other Windows and Glazed Doors: Maximum RSHGC	**NR** NEW!	0.23	**NR** NEW!	0.23	**NR** NEW!	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	**NR** NEW!
Skylights: Maximum U-factor	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Skylights: Maximum SHGC	**NR** NEW!	0.25	**NR** NEW!	0.25	**NR** NEW!	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	**NR** NEW!
Skylights: Minimum VT[2], Common Use Areas NEW!	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49

[1]Requirements also apply to doors included in the curtainwall or storefront construction assembly.

[2]Minimum VT requirements for fenestration other than skylights do not apply to multifamily buildings with three habitable stories or fewer

CZ = Climate Zone, **NEW!** = Updated for 2025 Energy Code, **NR** = Not required

Mechanical System Highlights

New Construction

Mechanical Ventilation: Dwelling Units

› **Mandatory**

› **Section 160.2(b)2Aivb**

The 2025 Energy Code no longer allows continuously-operating exhaust fans for ventilation in newly-constructed multifamily dwelling units. Each dwelling unit must have either a balanced or a supply ventilation system to provide required outside air.

In addition, the air leakage rate for each dwelling unit must not exceed 0.3 CFM/ft² of envelope surface area as tested and verified by an ECC-rater using compartmentalization (blower door) testing (see Residential Reference Appendix RA3.8 or Nonresidential Reference Appendix NA2.3). This ECC testing was only required for non-balanced systems in the 2022 Energy Code, but for 2025 it is required for both supply and balanced. Note that in multifamily buildings with four stories or more, this air leakage testing and verification may also be done by a certified Mechanical Acceptance Test Technician (ATT) per Nonresidential Reference Appendix NA1.9.

As in the 2022 Energy Code, all dwelling units in a multifamily building must use the same type of whole-dwelling-unit ventilation.

Mechanical Ventilation: Common Use Areas

› **Mandatory**

› **Section 160.2(c)3, Equation 160.2-H, Table 160.2-B**

The 2025 Energy Code changes Equation 160.2-H which is a formula to calculate the minimum CFM of outdoor air for ventilation for occupiable spaces. The new equation combines the two calculations required in the 2022 Energy Code.

Equation 160.2-H: Minimum Outdoor Airflow Rate (V_z)

The outdoor airflow rate in CFM (V_z) equals the larger of an occupant-based calculation (R_p x P_z) and an area-based calculation (R_a x A_z):

$\mathbf{V_z}$ = The larger of (R_p x P_z) or (R_a x A_z)

WHERE:

$\mathbf{V_z}$ = Minimum required outdoor airflow rate in CFM

$\mathbf{R_p}$ = 15 CFM of outdoor airflow per person

$\mathbf{P_z}$ = The expected number of occupants

$\mathbf{R_a}$ = Area-based minimum ventilation airflow rate in Table 160.2-B

$\mathbf{A_z}$ = The net occupiable floor area of the ventilation zone, in ft²

Table 160.2-B (see Table 6) has been revised for the 2025 Energy Code. The space types are now listed in alphabetical order for easier access, and the table includes the expected minimum occupant density for the different space types, as well as the area-based minimum ventilation rate R_a, air class, and notes.

Table 6: Minimum Occupant Load Density and Ventilation Rates for Multifamily Common Use Areas (Adapted from Table 160.2-B)

Space Type	Minimum Occupant Load Density (p/1000 ft²)[1]	Area-based Minimum Ventilation Rate R_a (CFM/ft²)	Air Class[2]	Notes
Bars, Cocktail Lounges	33	0.2	2	N/A
Break Rooms	33	0.15	1	F
Coffee Stations	33	0.15	1	F
Conference, Meeting	33	0.15	1	F
Corridors	5	0.15	1	F
Computer (not printing)	5	0.15	1	F
Daycare (through age four)	14	0.15	2	N/A
Dining Rooms	33	0.15	2	N/A
Disco, Dance Floors	100	0.15	2	F
Freezer and Refrigerated Spaces (< 50°F)	0	0	2	E
Game Arcades	45	0.15	1	N/A
Gym, Sports Arena (play area)	10	0.15	2	E
Health Club, Aerobics Room, Weight Rooms	10	0.15	2	N/A
Kitchen (cooking)	3	0.15	2	N/A
Laundry Rooms, Central	5	0.15	2	N/A
Lobbies, Pre-function	33	0.15	1	F
Multiuse Assembly	33	0.15	1	F
Occupiable Storage Rooms for Dry Materials	2	0.15	1	N/A
Occupiable Storage Rooms for Liquids or Gels	2	0.15	2	B

Table 6: Minimum Occupant Load Density and Ventilation Rates for Multifamily Common Use Areas (Adapted from Table 160.2-B) *(continued)*

Space Type	Minimum Occupant Load Density (p/1000 ft²)[1]	Area-based Minimum Ventilation Rate R_a (CFM/ft²)	Air Class[2]	Notes
Office Space	5	0.15	1	F
Reception Areas	5	0.15	1	F
Shipping, Receiving	2	0.15	2	B
Spectator Areas	33	0.15	1	F
Swimming (deck)	33	0.15	2	C
Swimming (pool)	10	0.15	2	C
Telephone, Data Entry	33	0.15	1	F
All Others	5	0.15	2	N/A

General Notes:

[1]The minimum occupant density is one half of the maximum occupant load assumed for egress purposes in the California Building Code (CBC).

[2]Air class represents expected air contaminant concentration levels on a scale of 1 to 4 with Class 1 Air being the cleanest. See §120.1(g) for more information.

Specific Notes:

B Rate may not be sufficient where stored materials include those having potentially harmful emissions.

C Rate does not allow for humidity control. "Deck area" refers to the area surrounding the pool that is capable of getting wet during pool use or when the pool is occupied. Deck area that is not expected to get wet will be designated as an occupancy category.

E Where combustion equipment is intended to be used on the playing surface or in the space, additional dilution ventilation, source control, or both shall be provided.

F Ventilation air for this occupancy category shall be permitted to be reduced to zero when the space is in occupied-standby mode.

Prescriptive Mechanical Ventilation: Dwelling Units

› **Prescriptive**

› **Section 170.2(c)3Biv**

§§170.2(c)3Biva and b set new Prescriptive requirements that, in CZs 1, 2, 4, 11 through 14, and 16 balanced ventilation systems with either a heat recovery ventilator (HRV) or energy recovery ventilator (ERV) must be used instead of supply ventilation systems to comply with §160.2(b)2Aivb1. These systems must meet separate requirements depending on whether they serve individual dwelling units or multiple dwelling units, as follows:

Balanced ventilation systems serving individual dwelling units in CZ 1, 2, 4, 11 through 14, and 16 must have:

- ERV or HRV
- Sensible recovery efficiency greater than or equal to 67 percent rated at 32°F
- Fan efficacy less than or equal to 0.6 W/CFM

These measures must be field verified per Residential Reference Appendix RA3.7.4.4 for buildings with three or fewer habitable stories or per Nonresidential Reference Appendix NA2.2.4.1.5 for buildings with four or more habitable stories.

Balanced ventilation systems serving multiple dwelling units in buildings with four or more habitable stories or more in CZ 1, 2, 4, 11 through 14, and 16 must have:

- ERV or HRV
- Sensible recovery efficiency greater than or equal to 67 percent rated at 32°F
- Fan power meeting §170.2(c)4A
- Recovery bypass or control to directly economize with ventilation air per outdoor air temperature limits in Table 170.2-G

These measures must be field verified per Nonresidential Reference Appendix NA7.18.4.

§170.2(c)3Bivc gives separate requirements for **dwelling units in multifamily buildings with three habitable stories or less in CZ 5 through 10, and 15**. When heat pumps are installed to meet §170.2(c)3Ai, balanced ventilation systems without ERV or HRV must have fan efficacy less than or equal to 0.4 W/CFM.

Prescriptive Dwelling Unit Fault Indicator Display (FID) for HRV and ERV

› **Prescriptive**

› **Section 170.2(c)3Bv**

§170.2(c)3Bv includes a new Prescriptive requirement to provide a ventilation system fault indicator display (FID) for all HRV and ERV systems serving individual dwelling units. An ECC-Rater must field verify these FID systems per Joint Reference Appendix JA17. FID field verification involves confirming that the proposed system is in the CEC's "Residential Fault Indicator Certification List", meaning that the manufacturer of the proposed FID system has certified to the CEC that the system meets the requirements of JA17.2 through JA17.4.

Fault Indicator Display Devices

Manufacturer-certified JA17-compliant FIDs indicate if systems maintain rated airflow and fan efficacy for the life of the equipment. To comply with Joint Reference Appendix JA17, FIDs must have instrumentation that measures system airflow and fan power and notifies dwelling unit occupants if the system is not working properly. FIDs must provide information using one or more of the following:

- A visual display that is readily accessible to occupants of the dwelling unit
- An electronic application
- An audible alarm accompanied by a visual display

Manufacturers of FID systems must certify to the CEC that their FID systems meet the requirements of JA17.2 through JA17.4. The CEC maintains the "Residential Fault Indicator Certification List" of FID products that are available for residential Energy Code compliance.

Cooling Tower Cycles of Concentration

› **Mandatory**

› **Section 110.2(e)**

The 2025 Energy Code §110.2(e) updates the 2022 Mandatory regulations to control and document open- and closed-circuit cooling tower cycles of concentration.

> **Cycles of concentration** represents the number of times the concentration of total dissolved solids (TDS) in cooling tower water is multiplied relative to the TDS in the makeup water. Because evaporation of pure water leaves dissolved solids behind in the system water, TDS increases over time as the tower operates. The number of times the dissolved minerals are concentrated is relative to the TDS in the makeup water. For example, five cycles of concentration represents five times the concentration of solids in the cooling tower system water relative to the TDS in the makeup water entering the tower.

The 2025 Energy Code requires cooling towers to have conductivity controls that maximize cycles of concentration based on local water quality conditions. While the 2022 Energy Code also allowed flow-based controls, the 2025 Energy Code only allows conductivity controls.

The 2025 Energy Code also changes cycles of concentration documentation requirements for building owners from maximum "cycles of concentration **needed**" to maximum "cycles of concentration **achievable**" based on local water supply conditions as reported by the local water supplier. See §110.2(e)2 for details on the new calculations required to determine maximum achievable cycles of concentration.

Prescriptive Cooling Tower Efficiency

› **Prescriptive**

› **Section 170.2(c)4Fv, Table 170.2-I**

§170.2(c)4Fv provides new Prescriptive minimum rated efficiency requirements for axial vane, open-circuit cooling towers serving condenser water loops for chilled water plants with a total of 900 gallons per minute (GPM) or greater. In the 2022 Energy Code, this equipment had to have minimum Prescriptive efficiency greater than or equal to 60 GPM/hp in CZ 2 through 15 but had no Prescriptive efficiency requirements in CZ 1 and 16. The 2025 Energy Code introduces new Table 170.2-I which lists separate Prescriptive minimum efficiency requirements for every CZ (see Table 7).

Table 7: Minimum Efficiency for Propeller or Axial Fan Open-circuit Cooling Towers (Adapted from Table 170.2-I)

Minimum Rated Fan Efficiency	CZ1	CZ2	CZ3	CZ4	CZ5	CZ6	CZ7	CZ8	CZ9	CZ10	CZ11	CZ12	CZ13	CZ14	CZ15	CZ16
GPM/hp	42.1	70	60	70	70	80	80	80	80	80	60	70	80	60	80	42.1

CZ = Climate Zone, **GPM/hp** = Gallons per minute per horsepower

Domestic Hot Water (DHW) Pipe Insulation

› **Mandatory**

› **Section 160.4(e)**

2025 Energy Code §160.4(e)1 adds new detailed requirements for where and how to install pipe insulation for multifamily domestic hot water (DHW) systems. The goal of these regulations is to make sure that insulation works well to limit wasteful heat loss from hot water pipes. These new measures require installers to pay special attention to sealing insulation seams and potential gaps in the insulation around all accessory components of the piping system such as pipe elbows, valves, and faucets. These accessory components are also known as plumbing appurtenances. Insulation on the piping and DHW appurtenances must be continuous without interfering with valve functions. See §160.4(e)1 for more details.

2025 Energy Code §160.4(e)2 expands on the multifamily pipe insulation thickness requirements from the 2022 Energy Code. As in the 2022 Energy Code, pipe insulation for systems within the parameters listed in Table 160.4-A (see Excerpt 1 in this fact sheet) must have the minimum insulation thickness or R-value as listed in Table 160.4-A (see Excerpt 2 in this fact sheet).

New for the 2025 Energy Code, if the proposed pipe insulation conductivity falls outside of the conductivity range in Table 160.4-A (see Excerpt 1), then the insulation must meet the minimum R-value in Table 160.4-A (see Excerpt 2), or it can meet the minimum thickness calculated using the new Equation 160.4-A (see next page). Insulation conductivity must be determined per ASTM C335 at the 100°F mean rating temperature from Table 160.4-A (see Excerpt 1).

Excerpt 1 from Table 160.4-A: DHW Pipe Insulation System Parameters

System Parameters	Values
Fluid Operating Temperature Range (°F)	105°F to 140°F[1]
Insulation Conductivity Range (Btu inch/hr-ft²-°F)	0.22 to 0.28 Btu inch/hr-ft²-°F
Insulation Conductivity Mean Rating Temperature (°F)	100°F

Excerpt 2 from Table 160.4-A: DHW Pipe Insulation Thickness **or** R-value Based on Pipe Diameter

Nominal Pipe Diameter (inches)	Pipe Insulation Thickness (inches)	Pipe Insulation (minimum R-value)
< 1	1.0	R-7.7
1 to < 1.5	1.5	R-12.5
1.5 to < 4	2.0	R-16
4 to < 8	2.0	R-12.5
8 or larger	2.0	R-11

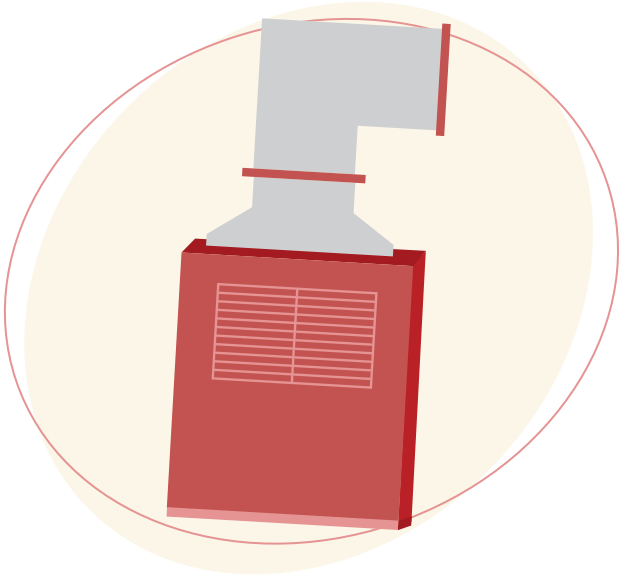
[1]Use pipe insulation values from 2025 Energy Code Table 120.3-A for multifamily DHW systems with water temperature greater than 140°F.

Domestic Hot Water (DHW) Pipe Insulation *(continued)*

› **Mandatory**

› **Section 160.4(e)**

The 2025 Energy Code §160.4(e)3 about pipe insulation protection has not changed from the 2022 Energy Code except to say that DHW piping appurtenance insulation exposed to the weather must also be protected with covers. Appurtenance insulation covers must be removable and able to be reinstalled.



Equation 160.4-A

$$T = PR\left[\left(1+\frac{t}{PR}\right)^{\frac{K}{k}} - 1\right]$$

WHERE:

- **T** = Minimum insulation thickness for material with conductivity K, inches.
- **PR** = Pipe actual outside radius, inches.
- **t** = Insulation thickness from Table 160.4-A, inches.
- **K** = Conductivity of alternate material at the mean rating temperature indicated in Table 160.4-A for the applicable fluid temperature range, in Btu-inch per hour per square foot per °F.
- **k** = The lower value of the conductivity range listed in Table 160.4-A for the applicable fluid temperature range, Btu-inch per hour per square foot per °F.

Individual Heat Pump Water Heater Ready Requirements

› **Mandatory**

› **Section 160.9(e)**

If new multifamily dwelling units use individual gas or propane water heaters, they must also install components that make it easier to install future individual electric heat pump water heaters (HPWHs) at the same locations. The 2022 Energy Code included multifamily HPWH-ready requirements in §160.4(a), but the 2025 Energy Code expands individual HPWH-ready requirements and moves them to §160.9(e).

Requirements to install a dedicated 125-volt, 20 amp electrical receptacle and a condensate drain have not changed from the 2022 Energy Code. However, there are new space and ventilation requirements for individual HPWH readiness.

The 2025 Energy Code requires that a space large enough to accommodate a future HPWH must be shown in the construction documents. The space must be at least 39" wide by 39" deep by 96" tall.

The 2025 Energy Code also requires one of the following ventilation options for individual HPWH readiness:

1. The reserved HPWH space must be at least 700 cubic feet in volume; **or**
2. If designed to vent indoors, the designated space must vent to a communicating space in the same pressure boundary. The volume of the two spaces together must be at least 700 cubic feet and vent to the interior using:
   - **a.** Fully louvered doors with one layer of fixed slats and a minimum total net free area (NFA) of 250 square inches; **or**
   - **b.** Two permanent, equal size openings with minimum total NFA of 250 square inches located within 12" of the enclosure top and bottom; **or**
   - **c.** Two 8" ducts to a communicating space.
3. If the future HPWH space is designed to vent to the outdoors, it must vent through:
   - **a.** Fully louvered doors with one layer of fixed slats and a minimum total NFA of 250 square inches; **or**
   - **b.** Two permanent, equal size openings with minimum total NFA of 250 square inches located within 12" of the enclosure top and bottom; **or**
   - **c.** Two 8" capped ducts. All ducts that cross the pressure boundary must have at least R-6 insulation, and the ducts, connections, and building penetrations must be sealed.

Central Heat Pump Water Heater Ready Requirements

› **Mandatory**

› **Section 160.9(f), Joint Reference Appendix JA15**

Central water-heating systems that use gas or propane to heat water for multiple new dwelling units must also meet 2025 Energy Code §160.9(f) requirements to prepare for future central electric HPWH systems to serve those dwelling units. These requirements include the following:

Reserve space for a future central HPWH: Design a space that can support a future central HPWH system that can meet the total system load of the installed natural gas or propane system. This space must include enough area for condensers and tanks and for all required clearances. See Joint Reference Appendix JA15.2 for details.

Plan for ventilation: Central HPWHs must be adequately ventilated to work properly. The 2025 Energy Code requires one of the following ventilation strategies, based on the planned future central HPWH system location:

- **Outside:** The responsible person associated with the project must reserve physical outdoor space for a future HPWH system, **or**
- **Inside:** The responsible person associated with the project must reserve a pathway designed for future supply and exhaust ductwork, including penetrations to the outside. The reserved pathway and penetrations must be sized to serve a HPWH system that meets the total building hot water demand. The sizing can be done per calculations and documentation from the project's responsible person or else using Joint Reference Appendix JA15.2.3.

Condensate drainage piping: Either an approved condensate drainage receptacle must be installed within three feet of the reserved central HPWH location, or piping must be installed to drain condensate to an approved discharge location starting within three feet of the future heat pump system location (as allowed by the California Plumbing Code). The condensate drainage must be sized to serve a HPWH system that meets the building's total hot water demand, based on calculations and documentation provided by the project's responsible person, or alternatively, it must be sized per Joint Reference Appendix JA15.2.4.

Electrical: Reserve enough physical space on the bus system of the main switchboard or distribution board to provide adequate power to the future HPWH system, including the heat pump and temperature maintenance tanks. The electrical power needs must either be calculated and documented by the project's responsible person or per Joint Reference Appendix JA15.2.5.

Domestic Water-heating Systems for New Individual Dwelling Units

› **Prescriptive**

› **Section 170.2(d)1**

One notable change for the 2025 Energy Code is that gas tankless water heaters serving individual dwelling units are no longer allowed as a Prescriptive option for new low-rise multifamily buildings (three stories or fewer). A new exception to §170.2(d)1 allows individual gas tankless water heaters with an input of 200,000 Btuh or less in high-rise multifamily buildings (four stories or more).

The other 2025 Prescriptive water-heating options and exceptions for individual dwelling units remain the same as in the past Energy Code cycle. These options are:

- Per §170.2(d)1A, a single 240-volt heat pump water heater with compact distribution in CZ 1 and 16 and a drain water heat recovery system in CZ 16, **or**
- Per §170.2(d)1B, a single 240-volt heat pump water heater with a NEEA Tier 3 rating or higher and a drain water heat recovery system in CZ 16, **or**
- Per the exception to §170.2(d)1, new dwelling units with one bedroom or less may use a single 120-volt HPWH instead of a single 240-volt HPWH.

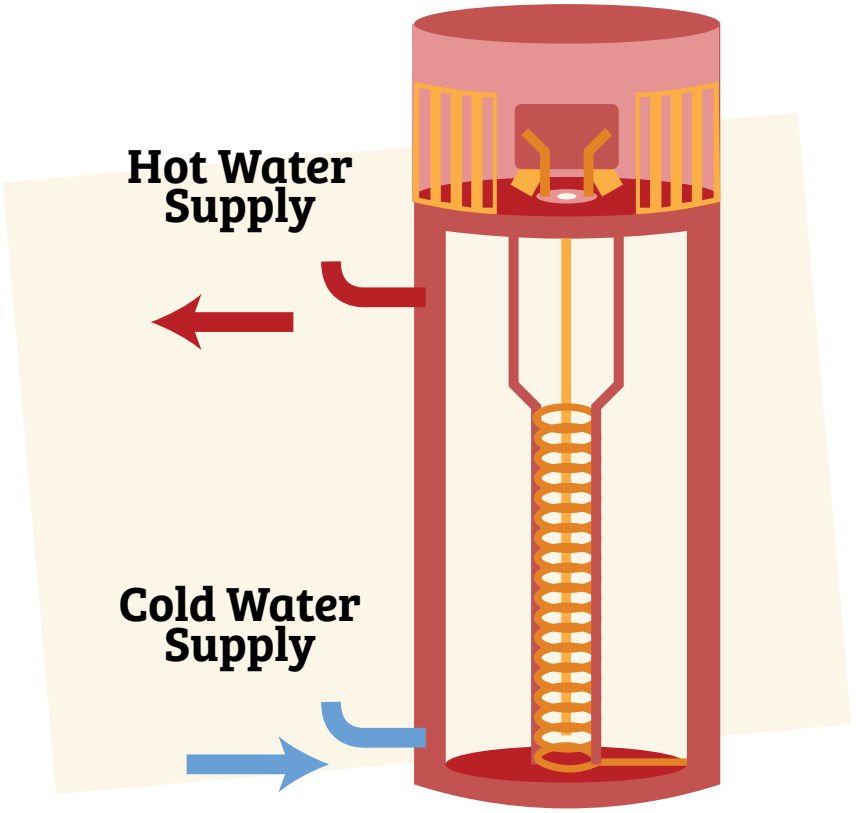


Figure 1: Heat Pump Water Heater Graphic

Central Domestic Water-heating Systems

› **Prescriptive**

› **Section 170.2(d)2**

There are several changes to the 2025 Energy Code Prescriptive requirements for central water-heating systems serving multiple multifamily dwelling units. Here are the updated Prescriptive options.

There are three central water-heating system types allowed:

- HPWH systems meeting NEEA Tier 2 or higher, **or**
- A single-pass* HPWH system as the primary HPWH (see Figure 2) (must meet additional design criteria that have not changed from 2022), **or**
- Gas or propane water-heating served by a solar thermal system (no change from 2022)

*A single-pass water heater is a water heater in which the cold water passes through once and is heated to the intended use temperature (See Figure 2).

There are also some 2025 Energy Code changes related to hot water piping and recirculation systems:

- New for the 2025 Energy Code, all hot water piping must be sized according to Appendix M of California Plumbing Code.
- Recirculation systems serving nine or more dwelling units must have a mechanical or digital thermostatic master mixing valve on each distribution supply and return loop, and they must meet the requirements of Residential Reference Appendix RA4.4.19.
- Insulation for hot water pipes and plumbing appurtenances must be field verified per Residential Reference Appendix RA3.6.3.

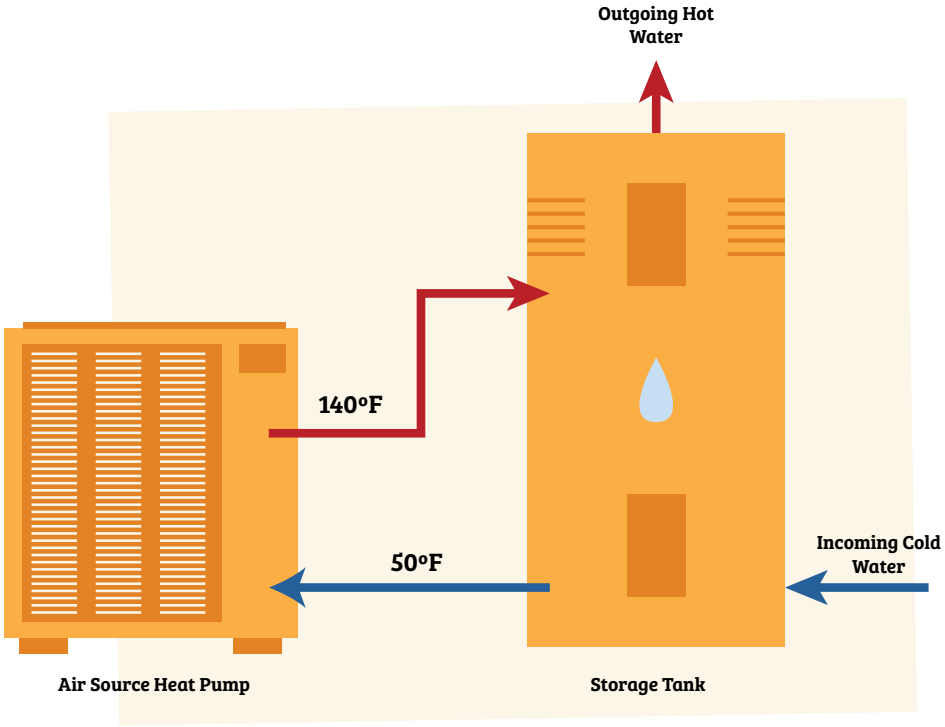


Figure 2: Single-pass Water Heating Graphic

Additions

Mechanical Ventilation: Dwelling Units

› **Prescriptive**

› **Section 180.1(a)2, Exception to Section 180.1(a)2, Exception to Section 180.1(a)2Aii**

Additions to multifamily dwelling units less than or equal to 1,000 ft² or junior accessory dwelling units (JADUs) may comply with mechanical ventilation using balanced, supply, or exhaust ventilation systems to provide outside air.

Additions that increase conditioned floor area by more than 1,000 ft² must generally provide outside air using balanced or supply ventilation systems. However, the exception in §180.1(a)2Aii also allows these Additions to use the same type of ventilation system as the existing building, which may include continuous exhaust ventilation if it is already in place.

Per the exception to §180.1(a)2, a dwelling unit air leakage test is not required for Additions.

New Construction

Indoor Lighting: Common Use Areas

› **Prescriptive**

› **Section 170.2(e)**

Tailored Lighting Method Removed

The 2025 Energy Code removes the Tailored Method as a compliance option for indoor lighting in common use areas. Previously, the Tailored Method supported extra wattage allowances for display lighting in common use areas, but this provision has now been incorporated into the updated Area Category Method.

Area Category Method Updates

The 2025 Energy Code adds some of the Tailored Method display lighting options to the Area Category Method (see Table 8).

Table 8: Area Category Method Lighting Power Density Values Including New Display Lighting (Excerpted from Table 170.2-M)

Primary Function Area	Allowed Lighting Power Density for General Lighting (W/ft²)	Additional Lighting Power Qualified Lighting Systems	Additional Lighting Power Additional Allowance (W/ft² unless noted otherwise)
Conference, Multipurpose, and Meeting Area	0.75	Display	0.25
		Wall Display MH ≤ 10’6”	2 W/ft
		Wall Display MH 10’7” to 14’	2.35 W/ft
		Wall Display MH > 14’	2.66 W/ft
		Floor Display MH ≤ 10’6”	0.30
		Floor Display MH 10’7” to 14’	0.35
		Floor Display MH > 14’	0.40
Dining Area: Bar, Lounge, and Fine Dining	0.45	Display	0.35
		Wall Display MH ≤ 10’6”	1.25 W/ft
		Wall Display MH 10’7” to 14’	1.5 W/ft
		Wall Display MH > 14’	1.7 W/ft
		Floor Display MH ≤ 10’6”	0.45
		Floor Display MH 10’7” to 14’	0.52
		Floor Display MH > 14’	0.60
		General Lighting in enclosed space of ceiling height > 10’	0.25
Lobby, Main Entry	0.70	Display	0.25
		Wall Display MH ≤ 10’6”	3 W/ft
		Wall Display MH 10’7” to 14’	3.5 W/ft
		Wall Display MH > 14’	4 W/ft

MH = Luminaire mounting height of the qualified lighting systems, **W/ft²** = Watts per square foot, **W/ft** = Watts per foot

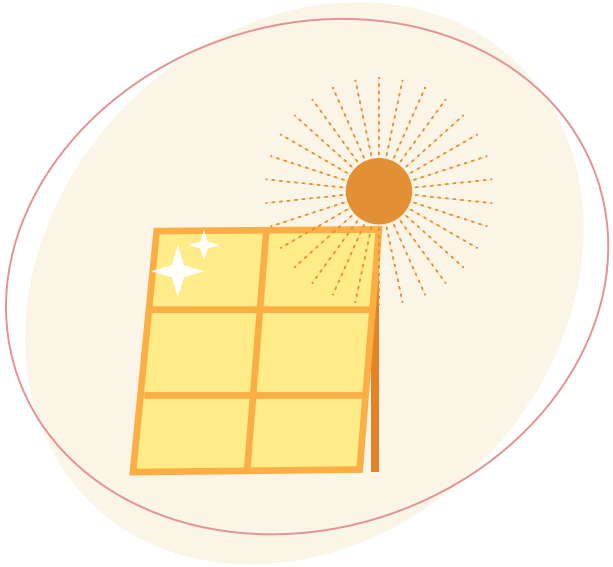
Battery Energy Storage System and Solar PV System Highlights

New Construction

Solar PV System Sizing for Multifamily Buildings with Three or Fewer Habitable Stories

› **Prescriptive**

› **Section 170.2(f)**



The Prescriptive solar PV kWdc (kW direct current) requirement for multifamily buildings with three or fewer habitable stories is determined as the smaller result from two different calculations, and one of those calculation options has changed in the 2025 Energy Code.

- One option is to calculate the required kWdc using Equation 170.2-C, and that has not changed for the 2025 Energy Code.
- The updated calculation option is to multiply the total Solar Access Roof Area (SARA, measured in ft^2) by certain W/ft^2 allowances. For the 2025 Energy Code those allowances have changed to 18 W/ft^2 for steep-sloped roofs and 14 W/ft^2 for low-sloped roofs.

In another 2025 update, there is no PV system requirement when the Prescriptive minimum PV system size is less than 4 kWdc. This is increased from 1.8 kWdc in the 2022 Energy Code.

The 2025 Energy Code also clarifies that the SARA always excludes roof areas unavailable due to compliance with other California state building codes. The SARA may also exclude areas needed to meet local building codes, but the Energy Code only allows those exclusions if confirmed by the Executive Director.

Solar Photovoltaic System Sizing for Multifamily Buildings with More Than Three Habitable Stories

› **Prescriptive**

› **Section 170.2(g)**

The Prescriptive solar PV kWdc requirement for multifamily buildings with four or more habitable stories is determined as the smaller result from the two following calculation options:

Calculate PV Capacity Using Equation 170.2-D

One option is to calculate the required kWdc using Equation 170.2-D:

$$kW_{PVdc} = (CFA \times A)/1000$$

WHERE:

- kW_{PVdc} = Minimum rated PV system capacity in kW
- **CFA** = Conditioned floor area in ft²
- **A** = PV capacity factor in W/ft² as specified in Table 9 for the building type (copied from Table 170.2-U)

In the 2025 Energy Code, this equation remains the same as in the 2022 Energy Code. However, Table 9 includes new building and space types with PV requirements, plus updated PV capacity factors for most of the remaining building types from 2022.

Multifamily buildings are often designed as mixed-use facilities. The "Multifamily > 3 Stories" category applies to both multifamily dwelling units and common use areas. The other building types in Table 9 cover any separate nonresidential space types that are part of the larger facility. The updated PV capacity factors reflect the estimated electrical loads that the PV system needs to cover for the different space types.

In mixed occupancy buildings, use Equation 170.2-D to calculate the minimum rated PV system capacity for each of the project's listed building types based on their conditioned floor area. The sum of the PV capacities for all the different occupancies is the total PV capacity requirement for the building using Equation 170.2-D.

Calculate PV Capacity Based on Solar Access Roof Area

The other PV capacity calculation option is to multiply the total Solar Access Roof Area (SARA, measured in ft²) by certain W/ft² allowances. For the 2025 Energy Code those allowances have changed to 18 W/ft² for steep-sloped roofs and 14 W/ft² for low-sloped roofs.

The 2025 Energy Code also clarifies that the SARA always excludes roof areas unavailable due to compliance with other California state building codes. The SARA may also exclude areas needed to meet local building codes, but the Energy Code only allows those exclusions if confirmed by the Executive Director.

Table 9: PV Capacity Factors in W/ft² of Conditioned Floor Area (Copied from Table 170.2-U)

Building Type	CZ1	CZ2	CZ3	CZ4	CZ5	CZ6	CZ7	CZ8	CZ9	CZ10	CZ11	CZ12	CZ13	CZ14	CZ15	CZ16
Events and Exhibits	3.48	4.28	3.66	4.32	3.77	4.05	4.28	4.83	4.63	4.80	5.04	4.44	4.95	4.36	5.48	3.38
Library	0.39	3.23	2.59	3.25	2.48	2.74	3.04	3.49	3.32	3.69	3.79	3.32	3.79	3.37	4.49	2.84
Hotel, Motel	1.69	1.90	1.66	1.97	1.69	1.87	1.94	2.22	2.09	2.20	2.30	2.05	2.30	2.02	2.72	1.73
Office, Financial Institution, Unleased Tenant Space, Medical Office Building, Clinic	2.59	3.13	2.59	3.13	2.59	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.13	3.80	2.59
Restaurants	8.55	9.32	8.16	9.65	8.21	8.73	9.11	10.18	9.75	10.28	10.85	9.73	10.69	9.73	12.25	8.47
Retail, Grocery	3.14	3.49	3.01	3.61	3.05	3.27	3.45	3.83	3.65	3.81	4.09	3.64	3.99	3.71	4.60	3.21
School	1.27	1.63	1.27	1.63	1.27	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	2.46	1.27
Warehouse	0.39	0.44	0.39	0.44	0.39	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.58	0.39
Religious Worship	4.25	4.65	3.49	4.52	3.72	4.29	4.64	5.89	5.30	5.67	5.89	4.99	5.78	4.63	7.57	3.90
Sports and Recreation	2.47	1.97	1.54	2.03	1.60	1.84	1.98	2.63	2.47	2.60	2.75	2.20	2.72	2.15	4.03	1.81
Multifamily > 3 stories	1.82	2.21	1.82	2.21	1.82	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.77	1.82

CZ = Climate Zone, **W/ft²** = Watts per square foot

Battery Energy Storage Systems (BESS)

› **Prescriptive**

› **Section 170.2(h), Table 170.2-V**

The 2025 Energy Code §170.2(h) updates the Prescriptive battery energy storage system (BESS) requirements for new multifamily buildings with four or more habitable stories. As in the 2022 Energy Code, all multifamily buildings with four or more stories that must have a PV system per §170.2(g) must also have a BESS.

The 2025 Energy Code defines new equations to calculate the minimum rated usable energy capacity and minimum power capacity for BESS. The minimum rated energy capacity must be calculated using either Equation 170.2-E **or** Equation 170.2-F, if the SARA method was used to determine PV capacity. Both of those equations use the new BESS capacity factors from the updated Table 170.2-V (excerpted in this fact sheet in Table 10). The minimum rated power capacity must be calculated using Equation 170.2-G.

Equation 170.2-E Battery Energy Storage System Minimum Rated Usable Energy Capacity:

$$kWh_{batt} = ((CFA \times B)/(1{,}000 \times C^{0.5}))$$

OR

Equation 170.2-F Battery Energy Storage System Minimum Rated Usable Energy Capacity, SARA-adjusted:

$$kWh_{batt} = ((CFA \times B)/(1{,}000 \times C^{0.5})) \times (kW_{PVdc,\ SARA} / kW_{PVdc})$$

WHERE:

kWh_{batt} = Minimum Rated Usable Energy Capacity of the BESS in kWh

kW_{PVdc} = Minimum Rated PV Capacity in kW from Equation 170.2-D

$kW_{PVdc,SARA}$ = Minimum Rated PV Capacity in kW from the SARA calculation

CFA = Conditioned floor area (ft²) subject to the PV system requirements of §170.2(g)

B = BESS Capacity Factor (Wh/ft²) from Table 170.2-V for the building type (see Table 10 in this fact sheet)

C = Rated single charge-discharge cycle AC to AC (round-trip) efficiency of the BESS

Equation 170.2-G Battery Energy Storage System Minimum Rated Power Capacity:

$$kW_{batt} = kWh_{batt} / 4$$

WHERE:

kW_{batt} = Minimum Rated Power Capacity of the BESS in kWdc

kWh_{batt} = Minimum Rated Usable Energy Capacity of the BESS in kWh

In mixed occupancy buildings, calculate the minimum rated usable energy capacity for each of the project's listed building types from Table 10 based on their conditioned floor areas. The total battery system capacity for the building must be the sum of the minimum rated usable energy capacities for each of the listed building types added together.

No BESS is required if:

- The installed PV capacity is less that 15 percent of the capacity calculated using Equation 170.2-D, **or**
- Buildings have BESS requirements with less than 10 kWh minimum rated usable energy capacity

Table 10: BESS Capacity Factors in Wh/ft² of Conditioned Floor Area (Excerpted from Table 170.2-V)

Building Type	CZ1	CZ2	CZ3	CZ4	CZ5	CZ6	CZ7	CZ8	CZ9	CZ10	CZ11	CZ12	CZ13	CZ14	CZ15	CZ16
Events and Exhibits	1.82	1.95	1.74	2.12	1.91	2.13	2.24	2.30	2.36	2.47	2.62	2.16	2.64	2.68	3.22	1.89
Library	0.37	7.17	5.97	6.75	5.64	6.08	6.19	7.13	7.18	7.56	7.17	6.93	6.88	6.81	7.93	6.40
Hotel or Motel	0.86	0.84	0.77	0.92	0.81	0.89	0.90	1.01	1.00	1.11	1.14	0.96	1.18	1.18	1.49	0.85
Office, Financial Institution, Unleased Tenant Space, Medical Office Building or Clinic	NR	5.26	4.35	5.26	4.35	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	6.39	4.35
Restaurants	4.36	4.11	3.78	4.37	3.89	4.02	4.11	4.49	4.47	4.82	5.05	4.43	5.05	5.24	6.23	4.11
Retail, Grocery	1.89	1.82	1.71	1.82	1.72	1.80	1.76	1.92	1.97	2.05	2.22	1.95	2.16	2.29	2.66	1.91
School	NR	3.05	2.38	3.05	2.38	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	4.60	2.38
Warehouse	0.37	0.41	0.37	0.41	0.37	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.54	0.37
Religious Worship	2.21	2.25	1.74	2.42	2.08	2.75	2.94	3.37	3.17	3.37	3.58	2.72	3.62	3.21	4.89	2.37
Sports and Recreation	1.26	0.98	0.76	1.14	0.86	1.20	1.23	1.57	1.53	1.65	1.83	1.27	1.86	1.57	3.02	1.13
Multifamily > 3 stories	1.88	2.27	1.88	2.27	1.88	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.85	1.88

CZ = Climate Zone, **NR** = Not required, **Wh/ft²** = Watt-hours per square foot

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- 2025 Title 24, Part 6 Essentials – Nonresidential Standards: What's New

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Of special interest:

- Fact Sheets for Buildings
  - » Coming soon – search for "multifamily buildings" on our website for new 2025 resources
- Fact Sheets for Appliances
  - » MAEDbS 101

CALIFORNIA ENERGY COMMISSION

California Energy Commission (CEC)
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Learn more about the CEC and its programs.

- 2025 Building Energy Efficiency Standards: Explore the main CEC web portal for the 2025 Energy Code, including information, documents, and historical information.
- 2025 California Energy Code Fact Sheet: Download this brief summary of the Title 24, Part 6 purpose, current changes, and impact.
- California Appliance Efficiency Standards Site: Visit this site for information on California's Title 20 Appliance Efficiency Regulations.
- **Energy Code Hotline**
  - » Call: 1-800-772-3300 (Free)
  - » Submission Form
- Energy Code Support Center: Use these online resources developed for building and enforcement communities to learn more about Title 24, Part 6.
- Modernized Appliance Efficiency Database System (MAEDbS): Search this database to find products that comply with Title 24, Part 6 and Title 20.

Additional Resources

Title 24 Stakeholders
title24stakeholders.com

The Codes and Standards Enhancement (CASE) initiative presents recommendations to support the CEC's efforts to update Title 24, Part 6 to include new requirements or to upgrade existing requirements for various technologies. Three California investor-owned utilities sponsor this effort. The Statewide CASE Team encourages the open exchange of comments and concerns from all stakeholders engaged in the Title 24, Part 6 code change process. Contact them and they will put you in touch with the appropriate CASE Team members.

Reach Codes
localenergycodes.com

Collaborating with cities, counties, and stakeholders to drive reach code development and adoption for long-term climate and energy efficiency benefits. View a list of adopted ordinances at the link provided.

CALGreen
calgreeninfo.com

CALGreen is a mandatory green building code with additional voluntary provisions. CALGreen is Part 11 of the California Building Standards Code, Title 24 of the California Code of Regulations. Codes are updated and adopted on an 18-month cycle, triennial and intervening. The current code is effective through December 31, 2025.

EnergyCodeAce™ SDGE™ Southern California Edison® Energy for What's Ahead® Pacific Gas and Electric Company®

This program is funded by California utility customers and administered by Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric Company (SDG&E®), and Southern California Edison Company (SCE) under the auspices of the California Public Utilities Commission.

Handout 3:

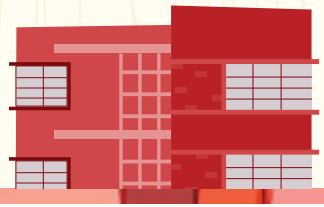
2025 Energy Code Fact Sheet

Multifamily Buildings: What's Changed in 2025?

Energy Code Ace

Ace Resources™

Multifamily Buildings
What's Changed in 2025?



Using this Fact Sheet

Use this fact sheet if you need to examine the language of the 2025 California Building Energy Efficiency Standards (Energy Code or Title 24, Part 6) for multifamily buildings.

- Energy Code changes are organized by building feature, such as envelope, electrical, etc.
- Each building feature section includes explanatory notes on all applicable sections.
- When language has been added or substantially revised, the intent of the language of the 2025 Energy Code is included.
- If there are no changes, or minimal clean-up, those Energy Code sections are not included.
- To review Energy Code updates for other occupancy types, refer to these fact sheets: Nonresidential Buildings: What's Changed in 2025 and Single-family Buildings: What's Changed in 2025.

What's Included:

This fact sheet describes changes made to the 2022 Energy Code and incorporated in the 2025 Energy Code for multifamily buildings.

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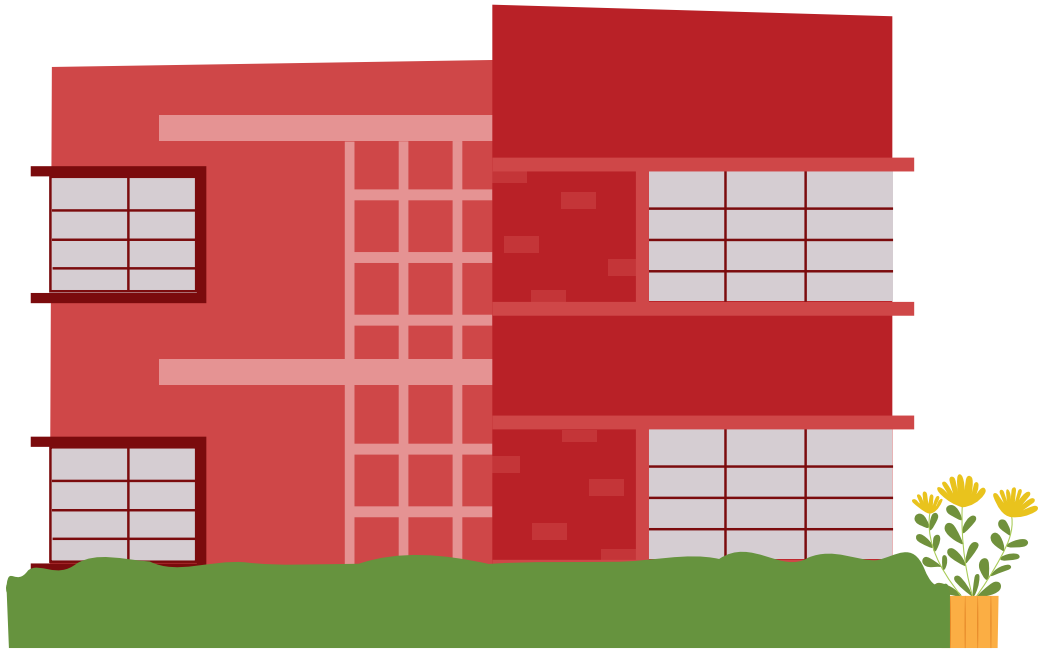

Mechanical Systems: Multifamily Occupancies

Table 1: Changes to the 2025 Energy Code, Mechanical Systems

Building Application	Mandatory		Prescriptive	Performance	Additions and Alterations	Reference Appendices
	All Occupancy Subchapters 1-2 (§§100.0-110.12)	Multifamily Buildings Subchapter 10 (§§160.0-160.9	Subchapter 11 (§§170.0 and 170.2(a)-(h))	Subchapter 11 (§§170.0-1)	Subchapter 12 (§§180.0-4)	
General	§100.0 **Revised** §100.1 **Revised** §100.2 **Revised** §§110.0-.1 ***No Change***	N/A	§170.2 ***No Change***	§§170.0-1 **Revised**	§180.0 ***No Change***	JA2 Weather/Climate: ***No Change*** JA3 Energy Budget: **Revised**
Heating, Ventilation, Air Conditioning (HVAC) (conditioned spaces)	§110.2 **Revised** §110.5 ***No Change***	§160.3 **Revised**	§170.2(c) **Revised**	§§170.0-1 **Revised**	§180.1(a)2 **Revised** §180.1(b) ***No Change*** §180.2(b)2 **Revised** §180.2(b)5 ***No Change***	JA5 OCST Thermostats: **Revised** JA6 HVAC System FDD: **Revised** JA9 Low Leakage AHU: ***No Change*** JA14 Central HPWH: ***No Change*** RA1 Refrigerant Charge: ***No Change*** RA2 Field Verification and Diagnostic Testing: **Revised** RA3 Field Verification/ Diagnostic Protocols: **Revised** RA4 Energy Efficiency Measures: ***No Change*** NA1 ECC/HERS Testing: **REMOVED** NA3 Fan Motor Efficiencies: ***No Change*** NA7 Installation/Acceptance: **Revised**
Ventilation and Indoor Air Quality	N/A	§160.2 **Revised**	§170.2(c)3B **Revised**	§§170.0-1 **Revised**	§180.2(b)5 ***No Change***	JA17 HRV/ERV FID: **NEW!** RA2 Field Verification and Diagnostic Testing: **Revised** RA3 Field Verification and Diagnostic Protocols: **Revised** NA1 Verification/Acceptance: **Revised**

Mechanical Systems: Multifamily Occupancies

Table 1: Changes to the 2025 Energy Code, Mechanical Systems *(continued)*

Building Application	Mandatory		Prescriptive	Performance	Additions and Alterations	Reference Appendices
	All Occupancy Subchapters 1-2 (§§100.0-110.12)	Multifamily Buildings Subchapter 10 (§§160.0-160.9	Subchapter 11 (§§170.0 and 170.2(a)-(h))	Subchapter 11 (§§170.0-1)	Subchapter 12 (§§180.0-4)	
Water Heating	§110.3 **Revised**	§160.4 **Revised** §160.9(b) ***No Change*** §160.9(e) **NEW!** §160.9(f) **NEW!**	§170.2(d) **Revised**	§§170.0-1 **Revised**	§180.0(a)3 ***No Change*** §180.2(b)3 ***No Change***	JA13 HPWH Demand Management: **Revised** JA14 Central Heat Pump Water Heater: ***No Change*** JA15 Central Heat Pump Water Heater Ready: **NEW!** RA4.4 Water Heating Special Measures: **Revised**
Pool and Spa	§110.4 **Revised** §110.5 ***No Change***	N/A	N/A	N/A	§180.0(a)3 ***No Change*** §180.2(b)3 ***No Change***	JA16 Criteria for Pool and Spa Heating: **NEW!**

Title 24, Part 1

Article 1 – Energy Building Regulations

› **Mandatory**

› **Sections 10-103.1 - 10-103.2 Nonresidential Lighting and Mechanical Acceptance Test Training and Certification**

§10-103.1(c)3F through 10-103.2(c)3F "Quality Assurance and Accountability"

Revised: Additional requirements have been added in support of the auditing requirements.

› **Mandatory**

› **Section 10-103.3 Administrative Procedures for the Energy Code Compliance Program**

§10-103.3 "Administrative Procedures for Energy Code Compliance Program (ECC)"

NEW!: Program requirements moved from Title 20 to Title 24, Part 6. Home Energy Rating System (HERS) is now called Energy Code Compliance (ECC). New requirements are introduced for both ECC-Raters and ECC-Providers.

Title 24, Part 6

Subchapter 1 – All Occupancies

General Provisions

› **Mandatory**

› **Section 100.1 Definitions and Rules of Construction**

NEW!: **Air-to-Water Heat Pump (AWHP)** is a factory-made packaged heat pump system containing one or more compressors, and heat exchangers for transferring heat between refrigerant and air, as well as between refrigerant and water, and various other components. Its primary purpose is to generate heated or cooled water to meet space conditioning loads, domestic hot water loads, or both.

NEW!: **Domestic Hot Water System Appurtenance** are all elements that are in series in a domestic hot water distribution system, including fittings (elbows, tees, flanges, etc.), pumps, valves (isolation, mixing, balancing, check, etc.), strainers, hose bibs, coil u-bends, meters, sensors, heat exchangers and air separators.

Revised: Energy Budget is the maximum energy consumption that a proposed building, or portion of a building, can be designed to consume, calculated using Commission-approved compliance software as specified by §10-109 of the Energy Code and the Alternative Calculation Method Reference Manual. The Energy Budget for newly constructed buildings is expressed in terms of the Long-term System Cost (LSC) and Source Energy. The Energy Budget for Additions and Alterations is expressed in terms of LSC.

› **Mandatory**

› **Section 100.1 Definitions and Rules of Construction** *(continued)*

Revised: **Energy Efficiency Ratio 2 (EER2)** is the ratio of the average rate of space cooling capacity (Btu/h) delivered to the average rate of electrical energy consumed by the air conditioner or heat pump as determined in accordance to the test method in 10CFR430 Subpart B Appendix M1. EER is expressed in Btu/Wh.

NEW!: **Long-term System Cost (LSC)** is the CEC-projected present value of costs to California's energy system over a period of 30 years. LSC does not represent a prediction of individual utility bills.

NEW!: **Net Free Area (NFA)** is the total unobstructed area within the air gaps between louver and grille slats in a vent, allowing the passage of air. The narrowest distance between two slats, perpendicular to the surface of both slats is the air gap height. The narrowest width of the gap is the air gap width. The NFA is the air gap height multiplied by the air gap width multiplied by the total number of air gaps between slats in the vent.

Revised: **Pools** is any structure or product intended for swimming, bathing, or wading; designed and manufactured to be connected to a circulation system; and not intended to be drained and filled with each use. This includes, but is not limited to, inground, above ground, and on ground pools; and wading pools.

Revised: **Pools, Residential** is a pool intended for use that is accessory to a residential setting and available only to the household and its guests, and with specifications as defined within the scope of either ANSI/APSP/ICC-4, 2012 (R2022) or ANSI/APSP/ICC-5, 2011 (R2022).

NEW!: **Pool Pump, Dedicated-Purpose** refers to a category of pumps designed specifically for various pool related functions. This includes self-priming pool filter pumps, non-self-priming pool filter pumps, waterfall pumps, pressure cleaner booster pumps, integral sand-filter pool pumps, integral-cartridge filter pool pumps, storable electric spa pumps, and rigid electric spa pumps, as defined by 20 CCR §1602(g)(4).

NEW!: **Pool, Public** is a pool other than a residential pool, that is intended to be used for swimming or bathing and is operated by an owner, lessee, operator, licensee, or concessionaire, regardless of whether a fee is charged for use. Public pools include pools installed in private settings such as multifamily residential buildings or hotels that are available exclusively for use by tenants or guests.

NEW!: **Portable Electric Spa** is a factory-built electric spa or hot tub, supplied with equipment for heating and circulating water at the time of sale or sold separately for subsequent attachment, as defined by 20 CCR §1602(g)(2).

NEW!: **Programming Library** is a collection of programming logic used for controlling HVAC equipment with direct digital control systems.

NEW!: **Recovered Energy, On-Site** is recovered energy that is captured at the building site.

NEW!: **Self-Utilization Credit** is the limited Efficiency LSC energy budget compliance credit available for combined PV and battery energy storage systems for single-family, as specified by the Residential ACM Reference Manual, and low-rise multifamily, as specified by the Nonresidential and Multifamily ACM Reference Manual.

› **Mandatory**

› **Section 100.1 Definitions and Rules of Construction** *(continued)*

NEW!: **Simultaneous Mechanical Heat Recovery** is the simultaneous utilization of heat rejected from mechanical cooling for space heating or water heating.

NEW!: **Single Zone Constant Volume Heat Pump (SZHP)** is an Air-source Heat Pump which uses a supply fan whose speed does not vary.

NEW!: **Solar Pool Heating System** is an assembly of components designed to heat water for swimming pools, spas, or swimming pool and spa combinations by solar thermal means, excluding pool recirculation components.

Revised: **Source Energy** is defined as the long run hourly marginal source energy of fossil fuels that are combusted as a result of building energy consumption either directly at the building site or caused to be consumed to meet the electrical demand of the building considering the long-term effects of Commission-projected energy resource procurement. For a given hour, the value in that hour for each forecasted year is averaged to establish a lifetime average source energy.

Revised: **Virtual End Node (VEN)** is an interface with a demand responsive control system that accepts signals transmitted through OpenADR, consistent with the specifications in OpenADR 2.0a, or 2.0b, or Baseline Profile OpenADR 3.0.

Revised: **Water Heater** definitions include the following:

Consumer Water Heater is a water heater that meets the definition of a consumer product under USDOE 10 CFR 430.

Heat Pump Water Heater (HPWH) is a water heater that transfers thermal energy from one temperature level to another temperature level for the purpose of heating water, including all ancillary equipment such as fans, storage tanks, pumps, or controls necessary for the device to perform its function.

- **Integrated Heat Pump Water Heater** is a HPWH which has all components, including fans, storage tanks, pumps, or controls necessary for the device to perform its function contained in a single factory-made assembly.
- **Split-Refrigerant Heat Pump Water Heater** is a HPWH which has a single outdoor section and one or more indoor sections connected to the outdoor section via a refrigerant circuit.
- **Split-Hydronic Heat Pump Water Heater** is a HPWH that consists of multiple separate sections. One section houses all the refrigerant components, while one or more additional sections are designated for water storage. These sections are interconnected through a hydronic circuit.

Multi-Pass Water Heater is a water heater which the cold water passes through multiple times. The water temperature increases with each pass, until the storage tank reaches the intended storage temperature.

Single-Pass Water Heater is a water heater which the cold water passes through once and is heated to the intended use temperature.

› **Mandatory**

› **Section 100.2 Calculation of Energy Budgets**

Revised: When using the Performance approach for compliance, the energy budget for all newly constructed multifamily buildings is now expressed in terms of Long-term System Cost (LSC) and Source Energy. The energy budgets for Additions and Alterations are expressed in terms of LSC.

LSC is calculated by multiplying the building's annual hourly site energy use for each fuel type by the California Energy Commission (CEC) published LSC hourly factors, which vary for each hour of the year based on the energy type, Climate Zone, and building type. All other depletable energy sources other than electricity and natural gas must use the LSC factors for propane. A summary of LSC hourly factors is found in the Reference Joint Appendix JA3.

Source Energy is calculated by multiplying the annual hourly site energy use by Btu factors for fossil fuel used directly or indirectly at the building site, or to meet the electrical demand of the building.

› **Mandatory**

› **Section 110.2 Mandatory Requirements for Space-Conditioning Equipment**

§110.2(a) "Efficiency"

Revised: When a Federal Minimum Efficiency standard dictates, the Energy Code no longer specifies the required efficiency value. Instead, minimum efficiency will be determined using Title 20. As a result, the following tables are no longer supported in Title 24, Part 6:

- ***Removed:*** Table 110.2-E "Packaged Terminal Air Conditioners (PTAC) and Packaged Terminal Heat Pumps (PTHP)"
- ***Removed:*** 110.2-I "Warm-Air Furnaces and Combination Warm-Air Furnaces/Air-Conditioning Units, Warm-Air Duct Furnaces, and Unit Heaters"
- ***Removed:*** Table 110.2-J "Gas- and Oil-Fired Boilers"
- ***Removed:*** Table 110.2-L "Floor-Mounted Air Conditioners and Condensing Units Serving Computer Rooms"
- ***Removed:*** Table 110.2-M "Ceiling-Mounted Air Conditioners and Condensing Units Serving Computer Rooms"

The following tables include new revised efficiency minimums including referring to Federal Minimum Efficiency, when applicable:

- **Revised:** Table 110.2-A "Air Conditioners and Condensing Units"
- **Revised:** Table 110.2-B "Heat Pumps, Minimum Efficiency Requirements"
- **Revised:** Table 110.2-F (used to be 110.2-G) "Electrically Operated Variable Refrigerant Flow (VRF) Air-to-Air and Applied Heat Pumps – Minimum Efficiency Requirements"
- **Revised:** Table 110.2-G (used to be 110.2-H) "Electrically Operated Variable Refrigerant Flow Air-to-Air and Applied Heat Pumps"
- **Revised:** Table 110.2-H (used to be 110.2-K) "DX-DOAS Units, Single-Package and Remote Condenser no longer supports non-energy recovery systems"
- **Revised:** Table 110.2-I, J, K, L (used to be Table 110.2-N) "Heat Pump and Heat Recovery Chiller Packages" has been broken up to support ADA compliance and there are changes to some of the minimum efficiencies required.

› **Mandatory**

› **Section 110.2 Mandatory Requirements for Space-Conditioning Equipment** *(continued)*

§110.2(e) "Open and Closed-circuit Cooling Towers"

Revised: 1. Controls:

- Flow-based controls that maximize cycles of concentration are no longer allowed, only conductivity controls are allowed.
- Automated systems, that control system bleed and chemical feed based on conductivity, are to be installed per the manufacturer's specifications to maximize accuracy and no longer allow for "proportion to metered makeup volume, metered bleed volume, recirculating pump run time, or bleed time" design options.

2. Documentation: Maximum achievable cycles of concentration must be calculated using new methods. These calculations must be signed off by a Professional Engineer (P.E.) of record. The maximum achievable cycles of concentrations are based on the local water supply quality as reported by the local water supplier, and shall be the minimum of:

A. 2,970 divided by the conductivity of the entering make-up water

B. 1,845 divided by the total dissolved solids of the entering make-up water

C. 540 divided by the M-alkalinity excluding galvanized steel of the entering make-up water

D. 450 divided by the M-alkalinity including galvanized steel of the entering make-up water

E. 540 divided by the calcium hardness of the entering make-up water

F. 270 divided by the chlorides of the entering make-up water

G. 225 divided by the sulfates of the entering make-up water

H. 135 divided by the silica of the entering make-up water

I. Langelier Saturation Index:

$$= 10^{\left(\frac{-1}{2.038895}*[Log(M*0.9*1.219)-0.061105*Log(C*0.8)+0.55*Log(H*M)+0.0050325*T-5.95]\right)}$$

WHERE:

C = Conductivity of the entering make-up water

H = Calcium hardness of the entering make-up water

M = M-alkalinity excluding galvanized steel of the entering make-up water

T = Max skin temperature

› **Mandatory**

› **Section 110.2 Mandatory Requirements for Space-Conditioning Equipment** *(continued)*

Revised: **3. Cooling towers** shall not allow blowdown until one or more of the parameters in Table 110.2-A-1 reaches the maximum value specified:

Table 110.2-A-1 Recirculating Water Properties

Recirculating Water Parameters	Maximum Values
Conductivity (micro-siemens/cm)	2,970 micro-siemens/cm
Total dissolved solids (ppm)	1,845 ppm
Total alkalinity as $CaCO_3$ (ppm) excluding galvanized steel	540 ppm
Total alkalinity as $CaCO_3$ (ppm) galvanized steel (passivated)	450 ppm
Calcium hardness as $CACO_3$ (ppm)	540 ppm
Chlorides as Cl (ppm)	270 ppm
Sulfates (ppm)	225 ppm
Silica (ppm)	135 ppm
Langelier saturation index (LSI)	2.5 (LSI)

4. *No change*: Flow meter.

5. *No change:* Overflow Alarm.

6. *No change:* Drift Eliminators.

7. NEW! Conductivity controls and overflow alarm shall be verified according to NA 7.5.18 “Cooling Tower Conductivity Controls”

The **exception to §110.2(e)** for open- and closed-circuit cooling towers with a rated capacity less than 150 tons has not changed.

› **Mandatory**

› **Section 110.3 Mandatory Requirements for Service Water-Heating Systems and Equipment**

§110.3(c)7 "Installation – Air-Source Heat Pump Water Heaters (HPWHs)"

NEW!: There are new requirements for air-source heat pump water heaters regarding backup heat and ventilation.

› **Mandatory**

› **Section 110.4 Mandatory Requirements For Pool and Spa Systems and Equipment**

Revised: **a) Certification by Manufacturers:** Manufacturers are now required to include an energy efficiency rating within the permanent plate or card in addition to supporting the instructions for the energy efficiency operation of the pool or spa. There are no other substantive changes to the section.

b) Installation: Heating equipment must comply with the standard requirements of Table 110.4-A "Heating Equipment Standards." The piping length between the filter and heater, or dedicated suction and return lines, has changed from 36" to 18." Covers are required for electric or gas heated pools or spas. Time switches (or similar) must be permanently installed.

c) Heating Source Sizing: The newly installed heating source must be either a solar thermal system sized to 65% or more of the surface area for a public pool (if a residential pool or spa is serving only one dwelling unit, then it will meet the same requirements as single-family, which is 60%); a heat pump meeting JA16.3 "Criteria for Pool and/or Spa Heating" and supplementary heating controls per §110.4(d) "Controls for Heat Pump Pool Heaters with Supplementary Heating;" a solar system combined with a heat pump pool heater; or an on-site renewable or recovered energy system that provides 60% or more of the annual heating energy. Exceptions may apply, such as Alterations to existing heated pools or spas.

d) Controls for Supplementary Heating: Controls are required so that supplementary heating does not operate when the heating load can be met by a heat pump pool heater. Additionally, cut-on and cut-off temperatures for heat pump heating must be set higher than those set for supplementary heating.

› **Mandatory**

› **Section 160.2 Requirements for Ventilation and Indoor Air Quality**

§160.2(b)2Aivb — Dwelling Unit "Whole-dwelling Unit Mechanical Ventilation"

Revised: The exhaust only ventilation method for dwelling units is no longer allowed and must either be balanced, which also meets the Prescriptive requirement for dwelling unit ventilation, or supply, which will require the Performance Approach to show compliance. Field verification and diagnostic testing must be completed by an ECC-Rater when the building has up to three stories. When the building has four or more stories, the testing can be provided by either an ECC-Rater or a certified Mechanical Acceptance Test Technician (ATT).

§160.2(b)2Axi — Dwelling Unit "Balanced and Supply Ventilation Component Accessibility"

NEW!: There are new requirements for when balanced and supply only ventilation systems are installed. Indoor air quality (IAQ) filters and heat recovery ventilation (HRV) or energy recovery ventilation (ERV) systems are now required to be accessible for service from within occupiable spaces, basements, garages, balconies, and mechanical closets. If located behind access panels, doors, or grilles, the filter and the HRV or ERV system must be no more than 10' above a walking surface inside the space.

Exception: Systems that require servicing from inside the attic shall have a fault indicator display (FID), an access door with an integrated ladder and a walkway from the attic access door to the HRV or ERV system.

Fans, motors, heat exchangers, filters, and recovery cores shall meet all applicable requirements of California Mechanical Code §304.0 accessibility for service.

§160.2(b)2Biv — Dwelling Unit "Multifamily Buildings ≥ 4 Stories Field Verification"

Revised: In multifamily buildings with four or more habitable stories, the field verification and diagnostic testing required in §160.2(b)2Bi-iii "Dwelling Unit Field Verification and Diagnostic Testing," which requires an ECC-Rater, may alternatively be performed by a certified Mechanical Acceptance Test Technician (ATT) according to the requirements specified in NA1.9 "Acceptance Test Technicians Alternative Procedure."

§160.2(b)2C — Dwelling Unit "Central Ventilation System Duct Sealing"

Revised: There is a new exception for multifamily buildings with up to three stories in Climate Zone 6.

› **Mandatory**

› **Section 160.2 Requirements for Ventilation and Indoor Air Quality** *(continued)*

§160.2(c)3 — Common Use Area "Mechanical Ventilation"

Revised: The formula for determining minimum cubic feet per minute (CFM) has changed, though the CFM requirements by space type have not. Per Equation 160.2-H "Mechanical Ventilation," the larger of either equation sets the minimum airflow CFM requirements for the space.

Equation 160.2-H:

V_z = The larger of $R_p \times P_z$ or $R_a \times A_z$

WHERE:

R_p **=** 15 cubic feet per minute of outdoor airflow per person.

P_z **=** The expected number of occupants. For spaces without fixed seating, the expected number of occupants shall be the expected number specified by the building designer or the default occupancy density in Table 160.2-B "Minimum Ventilation Rates" times the occupiable floor area of the zone, whichever is greater. For spaces with fixed seating, the expected number of occupants shall be determined in accordance with the California Building Code §1004.6.

R_a **=** The area-based minimum ventilation airflow rate in Table 160.2-B "Minimum Ventilation Rates."

A_z **=** The net occupiable floor area of the ventilation zone in square feet.

§160.2(c)5Dv — Common Use Area "Operation During Occupied Times"

Revised: When the system is operating during hours of expected occupancy, the controls shall maintain system outdoor air ventilation rates no less than $R_a \times A_z$ per Equation 160.2-H "Mechanical Ventilation" for each space with a CO_2 sensor(s), plus the greater of either the exhaust air rate or the rate required by §160.2(c)3 "Mechanical Ventilation" for other spaces served by the system.

§160.2(c)5E — Common Use Area "Occupied Standby Zone Controls"

Revised: Previously called "occupancy sensor ventilation control devices," the requirements have not changed but a new exception has been added for zone and ventilation systems served by pneumatic controls.

§160.2(c)8A — Common Use Area "Air Classification and Recirculation Limitations"

Revised: A correction clarifies that Class 1 air is characterized by low contaminant concentration, low sensory-irritation intensity, and inoffensive odor. No other changes have been made.

› **Mandatory**

› **Section 160.3 — Mandatory Requirements for Space Conditioning Systems in Multifamily Buildings**

§160.3(b)1-2 — Dwelling Unit "Building Cooling and Heating Loads"

Revised: Space-conditioning equipment requirements have been revised as follows:

1. No changes have been made to the heating and cooling load calculation methodology. A **new exception** allows block loads to be used for HVAC system sizing for Additions.
2. No changes have been made to the indoor design conditions. Outdoor design conditions now include two additional sources: ASHRAE Handbook Fundamentals and ACCA Manual J. The SMACNA Residential Comfort System Installation Standards Manual was removed as an outdoor design condition source.

§160.3(b)5Liii — Dwelling Unit "Zonally Controlled Central Forced Air Systems"

Revised: Multispeed or variable speed compressor systems with controls that vary fan speed subject to the number of zones, as certified by the installer, may demonstrate compliance with the airflow (CFM/ton) and fan efficacy (watt/CFM) requirements of §160.3(b)5Liii by operating the system at maximum compressor capacity and system fan speed with all zones calling for conditioning.

§160.3(b)7 — Dwelling Unit "Defrost"

Revised: New heat pump installation requirements apply when a defrost delay timer is installed, where the delay timer must be set to at least 90 minutes in Climate Zones 2 through 5 and 11 through 14. The installer shall certify on the Certificate of Installation that the control configuration has been tested in accordance with the testing procedure.

Exception: Dwelling units in Climate Zones 1, 6 through 10, 15, and 16

§160.3(b)8 — Dwelling Unit "Capacity Variation with Third-party Thermostats"

Revised: The space conditioning system and thermostat together shall be capable of responding to heating and cooling loads by modulating system compressor speed. The installer shall certify on the Certificate of Installation that the control configuration has been tested in accordance with the testing procedure.

§160.3(c)2H — Common Use Area "Duct Sealing"

Revised: When duct sealing is triggered in Title 24, Part 6, a certified Acceptance Test Technician (ATT) will test the system rather than an ECC-Rater (previously known as a HERS Rater).

› **Mandatory**

› **Section 160.3 — Mandatory Requirements for Space Conditioning Systems in Multifamily Buildings** *(continued)*

§160.3(d) — Common Use Area "Mechanical Acceptance Testing"

Revised: Air economizers, and now also dedicated outdoor air systems (DOAS) and HRV or ERV systems, shall be tested in accordance with NA7.5.4 "Air Economizer Controls and Exhaust Air Heat Recovery."

Exception: Air economizers installed by the HVAC system manufacturer and certified to the CEC as being factory calibrated and tested are not required to comply with the Functional Testing section of the air economizer controls acceptance test as described in NA7.5.4.2 "Functional Testing."

› **Mandatory**

› **Section 160.4 — Mandatory Requirements for Water Heating Systems**

§160.4 — Mandatory Requirements for Water Heating Systems

Revised: The electrical, vent, condensate drain, and gas supply requirements for when a gas or propane water heater is used at the dwelling unit have been removed.

§160.4(e) — Dwelling Unit Pipe Insulation

Revised: All piping for multifamily domestic hot water systems shall be insulated and meet the applicable requirements below:

- **General Requirements:** The first eight feet of inlet cold water piping from the storage tanks, including piping between a storage tank and a heat trap, shall be insulated; Insulation on the piping and domestic hot water system appurtenances shall be continuous; Pipe supports, hangers, and pipe clamps shall be attached on the outside of rigid pipe insulation to prevent thermal bridges; All pipe insulation seams shall be sealed; Insulation for pipe elbows shall be mitered, preformed, or site fabricated with PVC covers; Insulation for tees shall be notched, preformed or site fabricated with PVC covers; Extended stem isolation valves shall be installed; All plumbing appurtenances on hot water piping from a heating source to the heating plant, at the heating plant, and distribution supply and return piping shall be insulated to meet the specific requirements supported in this section.

› **Mandatory**

› **Section 160.4 — Mandatory Requirements for Water Heating Systems** *(continued)*

§160.4(e) — Dwelling Unit Pipe Insulation *(continued)*

Revised: All piping for multifamily domestic hot water systems shall be insulated and meet the applicable requirements below:

- **Insulation Thickness.** For insulation conductivity in the range shown in Table 160.4-A "Pipe Insulation Thickness," for the applicable fluid temperature range, the insulation shall have the applicable minimum thickness or R-value shown. If the insulation conductivity falls outside the applicable fluid temperature range provided in Table 160.4-A, the insulation shall meet a minimum R-value as indicated in Table 160.4-A or have a thickness determined using Equation 160.4-A.

Equation 160.4-A:

$$T = PR\left[\left(1+\frac{t}{PR}\right)^{\frac{K}{k}}-1\right]$$

WHERE:

T = Minimum insulation thickness for material with conductivity K, inches.

PR = Pipe actual outside radius, inches.

T = Insulation thickness from Table 160.4-A, inches.

K = Conductivity of alternate material at the mean rating temperature indicated in Table 160.4-A for the applicable fluid temperature range, in Btu-inch per hour per square foot per °F.

K = The lower value of the conductivity range listed in Table 160.4-A for the applicable fluid temperature range, Btu-inch per hour per square foot per °F.

Insulation conductivity shall be determined in accordance with ASTM C335 at the mean temperature listed in Table 160.4-A, and shall be rounded to the nearest 1/100 Btu-inch per hour per square foot per °F.

The exception for factory installed piping with space-conditioning equipment has been removed. All other exceptions remain with no changes.

Mandatory Requirements *(continued)*

› **Mandatory**

› **Section 160.4 — Mandatory Requirements for Water Heating Systems** *(continued)*

§160.4(e) — Dwelling Unit Pipe Insulation *(continued)*

Table 160.4-A Pipe Insulation Thickness — Multifamily Domestic Hot Water Systems

Fluid Operating Temperature Range (°F)	Insulation Conductivity (Btu·in/h·ft² °F)	Insulation Conductivity Mean Rating Temperature (°F)	Nominal Pipe Diameter < 1 (inches)	Nominal Pipe Diameter 1 to <1.5 (inches)	Nominal Pipe Diameter 1.5 to < 4 (inches)	Nominal Pipe Diameter 4 to < 8 (inches)	Nominal Pipe Diameter ≥ 8 (inches)
105-140[1]	0.22-0.28	100	1.0 (R 7.7)	1.5 (R 12.5)	2.0 (R 16)	2.0 (R 12.5)	2.0 (R 11)

[1]Multifamily and hotel/motel domestic hot water systems with water temperature above 140°F shall use the row in Table 120.3-A for the applicable water temperature.

Insulation Protection: Appurtenances, along with piping, are now included with requirements for covers that can be removed and reinstalled.

› **Mandatory**

› **Section 160.9 Mandatory Requirements for Electric-ready Buildings**

§160.9(a) "General Requirements"

NEW!: The building electrical system shall be sized to meet the future electric requirements of the electric-ready equipment specified in §160.9. The building main service conduit, the electrical system to the point specified in each subsection and any on-site distribution transformers shall have sufficient capacity to supply full rated amperage at each electric-ready appliance in accordance with the California Electrical Code.

› **Mandatory**

› **Section 160.9 Mandatory Requirements for Electric-ready Buildings** *(continued)*

§160.9(e) "Individual Heat Pump Water Heater Ready"

NEW!: Systems using gas or propane water heaters to serve individual dwelling units shall include the following components for each gas or propane water heater:

Electrical:

- A dedicated 125-volt, 20-amp electrical receptacle connected to the electric panel with a 120/240-volt, three-conductor branch circuit rated for a minimum of 30 amps, located within three feet from the water heater and accessible to the water heater with no obstructions; Both ends of the unused conductor shall be labeled with the word "spare" and be electrically isolated; A reserved space for a single pole circuit breaker in the electrical panel adjacent to the circuit breaker for the branch circuit labeled with the words "Future 240V Use"; A condensate drain that is no more than two inches higher than the base of the installed water heater and allows natural draining without pump assistance; Construction drawings shall designate a space at least 39" by 39" and 96" tall for the future location of a heat pump water heater.

Ventilation:

- A minimum volume of 700 ft^3 to accommodate the space for a future heat pump water heater, **or**
- If venting to the indoors, the space for the future heat pump water heater must vent to a communicating space in the same pressure boundary, with the total combined volume connected via permanent openings must vent to the interior via one of the three options:
  - A fully louvered door with fixed louvers consisting of a single layer of fixed flat slats and a minimum total net free area (NFA) of 250 in^2, **or**
  - With two permanent openings of equal area with a minimum total NFA of 250 in^2 located within 12" from the enclosure top and bottom, **or**
  - Two 8" ducts to a communicating space
- If venting to the exterior, the designated space for the future heat pump water heater must vent to the exterior via one of the three options below:
  - A fully louvered door with fixed louvers consisting of a single layer of fixed flat slats and a minimum total net free area (NFA) of 250 in^2, **or**
  - With two permanent openings of equal area with a minimum total NFA of 250 in^2 located within 12" from the enclosure top and bottom, **or**
  - With two 8" capped ducts, where all ducts that cross the pressure boundary shall be insulated to a minimum insulation level of R-6 and the ducts, connections, and building penetrations shall be sealed.

› **Mandatory**

› **Section 160.9 Mandatory Requirements for Electric-ready Buildings** *(continued)*

§160.9(f) — Central Heat Pump Water Heater Ready

NEW!: Central water heating systems using gas or propane to serve multiple dwelling units shall meet the following requirements with the system input capacity of the gas or propane water heating system, determined as the sum of the gas or propane capacity of all water heating devices associated with each gas or propane water heating system:

- **Space Reserved:**
  - **Heat Pump:** The minimum space reserved shall include space for both service and air flow clearances and shall either meet the space required for a heat pump water heater system capable of satisfying the total building hot water demand, as calculated and documented by the responsible person associated with the project, or per JA15.2.1.
  - **Tanks:** The minimum space reserved shall include space for service clearances and shall either meet the space required for a heat pump water heater system that satisfies the total building hot water demand, as calculated and documented by the responsible person associated with the project, or per JA15.2.2.
- **Ventilation:** Ventilation shall be provided by either reserving the physical space for the future heat pump outside, or via a pathway reserved for future routing of supply and exhaust air. This shall be planned and identified for future use on the plan set. The reserved pathway and penetrations through the building envelope are to be sized to meet either, a reserved pathway and penetrations sized to serve a heat pump water heater system that meets the total building hot water demand as calculated and documented by the responsible person associated with the project, or per JA15.2.3.
- **Condensate Drainage Piping:** An approved condensate draining receptacle, sized per the California Plumbing Code, must be installed within 3’ of the reserved heat pump location. Alternatively, piping from within 3’ of the reserved heat pump location to an approved discharge location must be sized in accordance with the California Plumbing Code. The drainage system must be sized to serve a heat pump water heater system that meets the total building hot water demand, as calculated and documented by the responsible person associated with the project, or per JA15.2.4.
- **Electrical:** Physical space shall be reserved on the bus system of the main switchboard or a distribution board to serve the future heat pump water heater system, including the heat pump and temperature maintenance tanks. Additional physical space must be reserved to provide adequate power to the future heat pump water heater, based on the electrical power requirements for a future heat pump water heater system that meets the total building hot water demand, as calculated and documented by the responsible person associated with the project, or per JA15.2.5. Additional physical space must be reserved for the temperature maintenance tank, sized according to the power requirements for a system that meets the total building hot water demand, as calculated and documented by the responsible person associated with the project, or per JA15.2.5.

› Performance

› Section 170.1 Performance Approach

§170.1(a) "Energy Budget"

Revised: The energy budget of the Proposed Design building shall be no greater than the energy budget calculated for the Standard Design building using CEC-certified compliance software as specified by §10-109(c) "Compliance Software" and §10-116 "3rd Party Alternative Calculation Method Compliance Software."

Energy Budget. The energy budget is expressed in terms of Long-term System Cost (LSC) and Source Energy.

- **Long-term System Cost (LSC).** The LSC energy budget is determined by applying the Mandatory and Prescriptive Requirements of the Standard Design to the Proposed Design building and has two components, the **Efficiency LSC** and the **Total LSC**. The **Efficiency LSC** energy is the sum of the LSC energy for space-conditioning, water-heating, mechanical ventilation, and self-utilization credit(s). **Total LSC** energy is the sum of the Efficiency LSC energy and LSC energy from the PV system, battery energy storage systems (BESS), lighting, demand flexibility, and other plug loads.
- **Source Energy.** Source Energy reflects the long run marginal source energy of fossil fuels that are combusted as a result of building energy consumed either directly at the building site or to meet the electrical demand of the building.

§170.1(b)2 Compliance Demonstration Requirements for Performance Standards Field Verification of Individual Dwelling Unit Systems

NEW!: **D. Thermal Balancing Valve:** When performance compliance requires installation of thermal balancing valves with variable speed circulation pump(s), the installation shall meet the procedures specified in RA4.4.3

Revised: **REMOVED:** Whole house fans; central fan ventilation cooling system; precooling

› Prescriptive

› Section 170.2 Prescriptive Approach

§170.2(c)2C "Outdoor Design Conditions"

Revised: Outdoor design conditioned for nonresidential and hotel/motel, but not including licensed healthcare facilities, can use either JA2 "Climatic Data" or the ASHRAE Handbook, Fundamentals Volume. Heating design temperatures shall be based on "99% Heating Dry Bulb" or the "Heating Winter Median of Extremes" values.

§170.2(c)3BiaIIIB — Dwelling Unit "Space-conditioning and Ventilation Systems FID"

Revised: The fault indicator display (FID) option for refrigerant charge is **REMOVED**.

› **Prescriptive**

› **Section 170.2 Prescriptive Approach**

§170.2(c)3Biv — Dwelling Unit "Space-conditioning and Ventilation Systems Balanced Ventilation Systems"

Revised: Balanced ventilation systems with heat or energy recovery have been expanded to more Climate Zones: 1, 2, 4, 11 through 14, and 16. When a multifamily building with three or fewer stories utilizes a heat pump space heating system AND the balanced ventilation system does not support heat or energy recovery, the heat pump fan efficacy shall be no greater than 0.4 W/CFM in Climate Zones 5 through 10 and 15. All HRV or ERV systems serving individual dwelling units shall have an FID that is manufacturer certified in compliance with the requirements in JA17.4. The FID certification shall be verified by an ECC-Rater.

§170.2(c)4Fv — Common Use Area "Cooling Tower Efficiency"

Revised: Axial fan, open-circuit cooling towers serving condenser water loops for chilled water plants with a total of 900 gpm or greater shall have a minimum rated efficiency as specified in Table 170.2-I, including Climate Zones 1 and 16 (which was previously exempt):

Table 170.2-I Minimum Efficiency for Propeller or Axial Fan Open-Circuit Cooling Towers (GPM/Hp)

CZ1	CZ2	CZ3	CZ4	CZ5	CZ6	CZ7	CZ8	CZ9	CZ10	CZ11	CZ12	CZ13	CZ14	CZ15	CZ16
42.1	70	60	70	70	80	80	80	80	80	60	70	80	60	80	42.1

§170.2(c)4N— Common Use Area "Dedicated Outdoor Air System (DOAS)"

Revised: Energy or heat recovery systems added to direct expansion dedicated outdoor air systems (DX-DOAS) that condition, temper or filter 100% outdoor air separate from local or central space-conditioning systems serving the same space shall meet all the following:

- **DOAS unit fan systems with input power less than 1 kW** shall not exceed a total combined fan power of 1.0 W/CFM. DOAS with fan power greater than or equal to 1 kW shall meet the requirements of §140.4(c) "Nonresidential Fan Systems."
- **The DOAS supply air** shall be delivered directly to the occupied space or at the outlet of any terminal heating or cooling coils. Additionally, it shall cycle off any zone heating and cooling equipment fans, circulation pumps and terminal unit fans when there is no call for heating or cooling in the zone. **Exceptions** to this requirement include: active chilled beam systems; sensible-only cooling terminal units with pressure-independent variable-airflow regulating devices limiting the DOAS supply air to the greater of latent load or minimum ventilation requirements; and any configuration where a DOAS unit provides ventilation air to a downstream fan (such as a terminal box, air handling unit or other space-conditioning equipment), provided the total system airflow can be reduced to the ventilation requirement minimum or the downstream fan power does not exceed 0.12 watts per CFM when space temperatures are within the thermostat deadband (operating at low speed, per the manufacturer's specifications).

› **Prescriptive**

› **Section 170.2 Prescriptive Approach** *(continued)*

§170.2(c)4N— Common Use Area "Dedicated Outdoor Air System (DOAS)" *(continued)*

Revised: Energy or heat recovery systems added to direct expansion dedicated outdoor air systems (DX-DOAS) that condition, temper or filter 100% outdoor air separate from local or central space-conditioning systems serving the same space shall meet all the following:

- **DOAS supply and exhaust fans** shall have a minimum of three speeds to facilitate system balancing.
- **DOAS with mechanical cooling** providing ventilation to multiple zones and operating in conjunction with zone heating and cooling systems shall not use heating or heat recovery to warm supply air above 60°F when representative building loads or outdoor air temperature indicates that the majority of zones require cooling.

§170.2(d) — Dwelling Unit "Domestic Hot Water Systems"

Revised: **Individual Systems:** Gas and propane instantaneous water heaters are no longer prescriptively allowed for new multifamily buildings with three stories of fewer. A 120-volt heat pump water heater may be installed in place of a 240-volt heat pump water heater for new dwelling units with one bedroom or fewer.

Central Systems: The primary heat pump water shall prescriptively be a single-pass system (multi-pass was an option in the 2022 Energy Code), meet the requirements of the Northwest Energy Efficiency Alliance (NEEA) Advanced Water Heater Specification for Tier 2 commercial heat pump water heaters, or utilize a gas or propane system with a solar thermal system.

Hot Water Piping: Hot water pipes shall be sized in accordance with the California Plumbing Code Appendix M. Insulation for hot water pipes and plumbing appurtenances shall be field verified by an installing contractor per RA3.6.3.

Central System Recirculation Requirements: The recirculation system shall have a mechanical or digital thermostatic master mixing valve on each distribution supply and return loop, and meet the requirements specified in the RA4.4.19. The **exception** to this requirement is buildings with eight or fewer dwelling units.

› **Additions and Alterations**

› **Section 180.1 Additions**

§180.1(a)2 — Dwelling Unit "Mechanical Ventilation for Indoor Air Quality"

Revised: Clarity is provided to specify that dwelling unit compartmentalization testing when using a non-balanced ventilation system is not required for Additions, and that Additions can use exhaust, supply, or balanced ventilation system types.

› **Additions and Alterations**

› **Section 180.2 Alterations**

§180.2(b)2AivbIIB — Dwelling Unit "Altered Space-conditioning System Mechanical Cooling FID"

Revised: The FID option for refrigerant charge is **REMOVED**.

§180.2(b)2Bii and iii "Altered Duct Systems" "Altered Space-conditioning Systems"

Revised: When duct sealing is triggered in Title 24, Part 6, a certified Acceptance Test Technician (ATT) will test the system, rather than an ECC-Rater (previously known as a HERS Rater).

§180.2(b)5 — Dwelling Unit "Mechanical Ventilation for Indoor Air Quality for Dwelling Units"

Revised: Clarity is provided to specify that dwelling unit compartmentalization testing when using a non-balanced ventilation system is not required for Alterations, and that Alterations can use exhaust, supply, or balanced ventilation system types.

Envelope: Multifamily Occupancies

Table 2: Changes to the 2025 Energy Code, Envelope

Building Application	Mandatory		Prescriptive	Performance	Additions and Alterations	Reference Appendices
	All Occupancy Subchapters 1-2 (§§100.0-110.12)	Subchapter 10 (§§160.0-160.9)	Subchapter 11 (§§170.0 and 170.2(a)-(h))	Subchapter 11 (§§170.0-1)	Subchapter 12 (§§180.0-4)	
General	§100.0 **Revised** §100.1 **Revised** §100.2 **Revised**	§160.1 **Revised**	§170.2 ***No Change***	§§170.0-1 **Revised**	§180.0 ***No Change***	JA2 Weather/Climate: ***No Change*** JA3 Energy Budget: **Revised**
Envelope (conditioned)	§§110.6-8 ***No Change***	§160.1 **Revised**	§170.2(a) **Revised**	§§170.0-1 **Revised**	§180.2 **Revised**	JA4 U-factor/C-Factor/Thermal Mass: **Revised** Table 4.2.5 RA3.5 Quality Insulation Installation (QII): ***No Change*** RA4 Energy Efficiency Measures: ***No Change*** NA2.3 Verification/Acceptance: **Revised** NA5 Whole Building Air Leakage: ***No Change*** NA6 Alternate Fenestration Method (COG): ***No Change*** NA7 Installation/Acceptance NR: **Revised** NA7.4.6.3
Envelope (unconditioned)	N/A	N/A	§170.2(b) ***No Change***	N/A	§180.2 **Revised**	N/A

Subchapter 1 – All Occupancies

General Provisions

› **Mandatory**

› Section 100.1 Definitions And Rules of Construction

Revised: **Energy Budget** is the maximum energy consumption, that a proposed building, or portion of a building, can be designed to consume, calculated using Commission-approved compliance software as specified by §10-109 of the Energy Code and the Alternative Calculation Method Reference Manual. The Energy Budget for newly constructed buildings are expressed in terms of the Long-term System Cost (LSC) and Source Energy. The energy budget for Additions and Alterations is expressed in terms of LSC.

NEW!: **Long-term System Cost (LSC)** is the CEC-projected present value of costs to California's energy system over a period of 30 years. LSC does not represent a prediction of individual utility bills.

Revised: **Source Energy** is defined as the long run hourly marginal source energy of fossil fuels that are combusted as a result of building energy consumption either directly at the building site or caused to be consumed to meet the electrical demand of the building considering the long-term effects of Commission-projected energy resource procurement. For a given hour, the value in that hour for each forecasted year is averaged to establish a lifetime average source energy.

› **Mandatory**

› Section 100.2 Calculation of Energy Budgets

Revised: When using the Performance Approach for compliance, the energy budget for all newly constructed multifamily buildings is now expressed in terms of LSC and Source Energy. The energy budgets for Additions and Alterations are expressed in terms of LSC.

LSC is calculated by multiplying the building's annual hourly site energy use for each fuel type by the CEC-published LSC hourly factors, which vary for each hour of the year based on the energy type, CZ, and building type. All depletable energy sources other than electricity and natural gas must use the LSC factors for propane. A summary of LSC hourly factors is found in the Reference Joint Appendix JA3.

Source Energy is calculated by multiplying the annual hourly site energy use by Btu factors for fossil fuel used directly or indirectly at the building site, or to meet the electrical demand of the building.

Title 24, Part 6

Subchapter 2 – All Occupancies

Mandatory Requirements for the Manufacture, Construction and Installation of Systems, Equipment and Building Components

› **Mandatory**

› **Section 110.8 – Mandatory Requirements For Insulation, Roofing Products, and Radiant Barriers**

§110.8(i)3 "Solar Reflectance Index (SRI)"

Revised: Solar Reflectance Index (SRI), calculated as specified by ASTM E1980-1 (2019), may be used as an alternative to thermal emittance and an aged solar reflectance. SRI calculations must be based on Approach I from §6.1.1 of ASTM E1980-11 (2019) using only equation one and three and a moderate wind velocity of two to six meters per second.

Title 24, Part 6

Subchapter 10 – Multifamily

Mandatory Requirements

› **Mandatory**

› **Section 160.1 – Mandatory Requirements for Building Envelopes**

§160.1(e) "Fenestration Products"

Revised: A new **exception** is included for fenestration installed in buildings meeting Part 7 of the California Building Code (California Wildland-Urban Interface Code), and where the building is located in Fire Hazard Severity Zones or Wildland-Urban Interface (WUI) Fire Areas as designated by the local enforcement agency.

§160.1(g) "Slab Edge Insulation"

NEW!: Requirements for slab edge insulation are added to align with the 2022 Energy Code requirements for single-family, per §150.0(f).

- Insulation material alone without the facing shall have a water absorption rate no greater than 0.3% when tested in accordance with ASTM C272, Test Method A – 24-Hour-Immersion; **and**
- Water vapor permeance no greater than 2.0 perm/inch when tested in accordance with ASTM C272; **and**
- Concrete slab perimeter insulation shall be protected from physical damage and ultraviolet light deterioration; **and**
- Insulation for a heated slab floor shall meet the requirements of §110.8(g) "Insulation Requirements for Heated Slab Floors."

› **Performance**

› **Section 150.1 Performance Approach**

§150.1(b)1 "Performance Approach"

Revised: The energy budget of the Proposed Design building shall be no greater than the energy budget calculated for the Standard Design building using CEC-certified compliance software as specified by §10-109(c) "Compliance Software" and §10-116 "3rd Party Alternative Calculation Method Compliance Software."

Energy Budget for the Standard Design Building. The energy budget is expressed in terms of Long-term System Cost (LSC) and Source Energy.

- **Long-term System Cost (LSC).** The LSC energy budget is determined by applying the Mandatory and Prescriptive requirements of the Standard Design to the Proposed Design building and has two components, the **Efficiency LSC** and the **Total LSC**. The **Efficiency LSC** energy is the sum of the LSC energy for space-conditioning, water heating, mechanical ventilation, lighting, and self-utilization credit(s). **Total LSC** energy is the sum of the Efficiency LSC energy and LSC energy from the photovoltaic system, battery energy storage systems (BESS), and demand flexibility.
- **Source Energy.** Source Energy reflects the long run marginal source energy of fossil fuels that are combusted as a result of building energy consumed either directly at the building site or to meet the electrical demand of the building.

› Prescriptive
› Section 170.2 Prescriptive Approach

§170.2(a)1 "Envelope Component Requirements — Exterior Roofs and Ceilings"

Revised: The following roofing product features supported in Table 170.2-A "Envelope Component Package" have been revised.

Table 170.2-A "Envelope Component Package," Climate Zones 1 through 8

Envelope Feature	CZ1	CZ2	CZ3	CZ4	CZ5	CZ6	CZ7	CZ8
Option B[9] Low-Slope-Aged Solar Reflectance	NR	NR	NR	NR	NR	NR	NR	NR
Option B[9] Low-Sloped-Thermal Emittance	NR	NR	NR	NR	NR	NR	NR	NR
Option B[9] Low-Sloped-Solar Reflectance Index	NR	NR	NR	NR	NR	NR	NR	NR
Option B[9] Steep-Sloped-Aged Solar Reflectance	NR	NR	NR	NR	NR	NR	NR	NR
Option B[9] Steep-Sloped-Thermal Emittance	NR	NR	NR	NR	NR	NR	NR	NR
Option B[9] Steep-Sloped-Solar Reflectance Index	NR	NR	NR	NR	NR	NR	NR	NR
Option D[11] Low-Sloped-Aged Solar Reflectance	NR	**0.63 Revised**	NR	**0.63 Revised**	NR	**0.63 Revised**	**0.63 Revised**	**0.63 Revised**
Option D[11] Low-Sloped-Thermal Emittance	NR	**0.75 Revised**	NR	**0.75 Revised**	NR	**0.75 Revised**	**0.75 Revised**	**0.75 Revised**
Option D[11] Low-Sloped-Solar Reflectance Index	NR	**75 Revised**	NR	**75 Revised**	NR	**75 Revised**	**75 Revised**	**75 Revised**
Option D[11] Steep-Sloped-Aged Solar Reflectance	NR	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Option D[11]Steep-Sloped-Thermal Emittance	NR	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Option D Steep-Sloped-Solar Reflectance Index	NR	16	16	16	16	16	16	16

[9]Option B meets §170.2(a)1Bii.

[11]Option D meets §170.2(a)1Biv.

NR = No Requirement

› Prescriptive
› Section 170.2 Prescriptive Approach

§170.2(a)1 "Envelope Component Requirements — Exterior Roofs and Ceilings" *(continued)*

Revised: The following roofing product features supported in Table 170.2-A "Envelope Component Package" have been revised.

Table 170.2-A "Envelope Component Package," Climate Zones 9 through 16

Envelope Feature	CZ9	CZ10	CZ11	CZ12	CZ13	CZ14	CZ15	CZ16
Option B[9] Low-Slope-Aged Solar Reflectance	NR	NR	NR	NR	0.63	NR	0.63	NR
Option B[9] Low-Sloped-Thermal Emittance	NR	NR	NR	NR	0.75	NR	0.75	NR
Option B[9] Low-Sloped-Solar Reflectance Index	NR	NR	NR	NR	75	NR	75	NR
Option B[9] Steep-Sloped-Aged Solar Reflectance	NR	**0.25 Revised**	**0.25 Revised**	0.20	**0.25 Revised**	0.20	**0.25 Revised**	NR
Option B[9] Steep-Sloped-Thermal Emittance	NR	0.75	0.75	0.75	0.75	0.75	0.75	NR
Option B[9] Steep-Sloped-Solar Reflectance Index	NR	23	23	16	23	16	23	NR
Option D[11] Low-Sloped-Aged Solar Reflectance	0.63	0.63	0.63	**0.63 Revised**	0.63	0.63	0.63	NR
Option D[11] Low-Sloped-Thermal Emittance	0.75	0.75	0.75	**0.75 Revised**	0.75	0.75	0.75	NR
Option D[11] Low-Sloped-Solar Reflectance Index	75	75	75	**75 Revised**	75	75	75	NR
Option D[11] Steep-Sloped-Aged Solar Reflectance	0.20	0.20	0.20	0.20	0.20	0.20	0.20	NR
Option D[11]Steep-Sloped-Thermal Emittance	0.75	0.75	0.75	0.75	0.75	0.75	0.75	NR
Option D Steep-Sloped-Solar Reflectance Index	16	16	16	16	16	16	16	NR

[9]Option B meets §170.2(a)1Bii.

[11]Option D meets §170.2(a)1Biv.

NR = No Requirement

› **Prescriptive**

› **Section 170.2 Prescriptive Approach** *(continued)*

§170.2(a)3 "Envelope Component Requirements — Fenestration"

Revised: The following fenestration features supported in Table 170.2-A "Envelope Component Package" have been revised. Additionally, the differentiation between the Rated Solar Heat Gain Coefficient (RSHGC) requirements of multifamily buildings with three stories or fewer or four or more stories has been revised in which the requirements are the same for any size multifamily building; Visible transmittance (VT) requirements are now only required for fenestration in common use areas.

Table 170.2-A "Envelope Component Package"

Envelope Feature	CZ1	CZ2	CZ3	CZ4	CZ5	CZ6	CZ7	CZ8
Curtain Wall/ Storefront[7] - Maximum U-factor	0.38	0.41	0.41	0.41	0.41	0.41	0.41	0.41
Curtain Wall/ Storefront[7] - Maximum RSHGC	NR	0.26	NR	0.26	NR	0.26	0.26	0.26
Curtain Wall/ Storefront[7] - Minimum VT, NEW!: common use area	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
NAFS 2017 Performance Class AW[5] - Maximum U-factor	0.38	0.40	0.40	0.40	0.40	0.40	0.40	0.40
NAFS 2017 Performance Class AW[5] - Maximum RSHGC	NR	0.24	NR	0.24	NR	0.24	0.24	0.24
NAFS 2017 Performance Class AW[5] - Minimum VT, NEW!: common use areas	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
All Other Fenestration - Maximum U-factor	**0.28 Revised**	0.30	**0.28 Revised**	**0.28 Revised**	**0.28 Revised**	0.34	0.34	**0.30 Revised**
All Other Fenestration - Maximum RSHGC	NR	0.23	NR	0.23	NR	0.23	0.23	0.23

[5]Product must be certified to meet the North American Fenestration Standard/Specification for an Architectural Window (AW).

[7]**NEW!:** Requirements apply to doors included in the Curtainwall/Storefront construction assembly.

› **Prescriptive**

› **Section 170.2 Prescriptive Approach** *(continued)*

§170.2(a)3 "Envelope Component Requirements — Fenestration"

Revised: The following fenestration features supported in Table 170.2-A "Envelope Component Package" have been revised. Additionally, the differentiation between the Rated Solar Heat Gain Coefficient (RSHGC) requirements of multifamily buildings with three stories or fewer or four or more stories has been revised in which the requirements are the same for any size multifamily building; Visible transmittance (VT) requirements are now only required for fenestration in common use areas.

Table 170.2-A "Envelope Component Package"

Envelope Feature	CZ9	CZ10	CZ11	CZ12	CZ13	CZ14	CZ15	CZ16
Curtain Wall/ Storefront[7] - Maximum U-factor	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.38
Curtain Wall/ Storefront[7] - Maximum RSHGC	0.26	0.26	0.26	0.26	0.26	0.25	0.26	NR
Curtain Wall/ Storefront[7] - Minimum VT, NEW!: common use area	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
NAFS 2017 Performance Class AW[5] - Maximum U-factor	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.38
NAFS 2017 Performance Class AW[5] - Maximum RSHGC	0.24	0.24	0.24	0.24	0.24	0.24	0.24	NR
NAFS 2017 Performance Class AW[5] - Minimum VT, NEW!: common use areas	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
All Other Fenestration - Maximum U-factor	0.30	0.30	**0.28 Revised**	0.30	**0.28 Revised**	**0.28 Revised**	**0.28 Revised**	**0.28 Revised**
All Other Fenestration - Maximum RSHGC	0.23	0.23	0.23	0.23	0.23	0.23	0.23	NR

[5]Product must be certified to meet the North American Fenestration Standard/Specification for an Architectural Window (AW).

[7]**NEW!:** Requirements apply to doors included in the Curtainwall/Storefront construction assembly.

› **Prescriptive**

› **Section 170.2 Prescriptive Approach** *(continued)*

§170.2(a)5 "Envelope Component Requirements — Floors"

Revised: The slab-on-grade floor requirements for Climate Zone 16, previously only applicable to multifamily buildings with three stories or fewer, now apply to multifamily buildings of any size. These revised requirements are noted in Table 170.2-A "Envelope Component Package."

Table 170.2-A "Envelope Component Package"

Envelope Feature	CZ1	CZ2	CZ3	CZ4	CZ5	CZ6	CZ7	CZ8	CZ9	CZ10	CZ11	CZ12	CZ13	CZ14	CZ15	CZ16
Floors/Soffits - Slab Perimeter[8]	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	F 0.58 R 7.0 **Revised**

[8]If using F-factor to comply, use Reference Joint Appendices JA4, Table 4.4.7 to determine alternate depth and R-value to be less than or equal to the required maximum F-factor.

› **Additions and Alterations**

› **Section 180.2 Alterations**

§180.2(b)1C "Fenestration Alterations"

Revised: The revised fenestration RSHGC requirements in Table 180.2-B "Altered Fenestration U-factor and Maximum SHGC and RSHGC, Minimum VT" are noted below. Additionally, glazed doors are now included in the "all other" category, where previously they were also supported in the "curtainwall/storefront" category. Skylights U-factor, RSHGC, and VT are the same no matter the size of the multifamily building but do differ if serving a dwelling unit or a common use area.

The revision to **Exception 1** of this code section clarifies that Alterations that add vertical fenestration ≤ 50 ft² are exempt from the RSHGC and VT requirements of the Energy Code.

Table 180.2-B "Altered Fenestration U-factor and Maximum SHGC and RSHGC, Minimum VT"

Envelope Feature	Component	CZ1	CZ2	CZ3	CZ4	CZ5	CZ6	CZ7	CZ8
Curtainwall/Storefront/Window Wall/NEW!: Glazed Doors[1]	**U-factor**	0.38	0.41	0.41	0.41	0.41	0.41	0.41	0.41
Curtainwall/Storefront/Window Wall/NEW!: Glazed Doors[1]	**RSHGC**	**NR Revised**	0.26	**NR Revised**	0.26	**NR Revised**	0.26	0.26	0.26
Curtainwall/Storefront/Window Wall/NEW!: Glazed Doors[1] for Common Use Areas	**VT[2]***	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
NAFS 2017 Performance Class AW	**U-factor**	0.38	0.40	0.40	0.40	0.40	0.40	0.40	0.40
NAFS 2017 Performance Class AW	**RSHGC**	**NR Revised**	0.25	**NR Revised**	0.25	**NR Revised**	0.31	0.31	0.26
NAFS 2017 Performance Class AW for Common Use Areas	**VT[2]***	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
All Other: Windows, NEW!: Skylight, and Glazed Doors	**U-factor**	**0.28 Revised**	0.30	**0.28 Revised**	**0.28 Revised**	**0.28 Revised**	0.30	0.34	0.30
All Other: Windows, NEW!: Skylights, and Glazed Doors	**RSHGC**	NR	0.23	NR	0.23	NR	0.23	0.23	0.23

[1]**NEW!:** Requirements apply to glazed doors included in the Curtainwall/Storefront construction assembly.

[2]**NEW!:** Minimum VT requirements for fenestration other than Skylights do not apply to multifamily buildings with three stories or fewer.

› **Additions and Alterations**

› **Section 180.2 Alterations**

§180.2(b)1C "Fenestration Alterations"

Revised: The revised fenestration RSHGC requirements in Table 180.2-B "Altered Fenestration U-factor and Maximum SHGC and RSHGC, Minimum VT" are noted below. Additionally, glazed doors are now included in the "all other" category, where previously they were also supported in the "curtainwall/storefront" category. Skylights U-factor, RSHGC, and VT are the same no matter the size of the multifamily building but do differ if serving a dwelling unit or a common use area.

The revision to **Exception 1** of this code section clarifies that Alterations that add vertical fenestration ≤ 50 ft² are exempt from the RSHGC and VT requirements of the Energy Code.

Table 180.2-B "Altered Fenestration U-factor and Maximum SHGC and RSHGC, Minimum VT"

Envelope Feature	Component	CZ9	CZ10	CZ11	CZ12	CZ13	CZ14	CZ15	CZ16
Curtainwall/Storefront/Window Wall/NEW!: Glazed Doors[1]	**U-factor**	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.38
Curtainwall/Storefront/Window Wall/NEW!: Glazed Doors[1]	**RSHGC**	0.26	0.26	0.26	0.26	0.26	0.26	0.26	**NR Revised**
Curtainwall/Storefront/Window Wall/NEW!: Glazed Doors[1] for Common Use Areas	**VT[2]**	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
NAFS 2017 Performance Class AW	**U-factor**	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.38
NAFS 2017 Performance Class AW	**RSHGC**	0.26	0.25	0.25	0.25	0.25	0.25	0.25	**NR Revised**
NEW!: NAFS 2017 Performance Class AW for Common Use Areas	**VT[2]**	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
All Other: Windows, NEW!: Skylights, and Glazed Doors	**U-factor**	0.30	0.30	**0.28 Revised**	0.30	**0.28 Revised**	**0.28 Revised**	0.30	**0.28 Revised**
All Other: Windows, NEW!: Skylights, and Glazed Doors	**RSHGC**	0.23	0.23	0.23	0.23	0.23	0.23	0.23	NR

[1]**NEW!:** Requirements apply to glazed doors included in the Curtainwall/Storefront construction assembly.

[2]**NEW!:** Minimum VT requirements for fenestration other than Skylights do not apply to multifamily buildings with three stories or fewer.

Electrical Systems: Multifamily Occupancies

Table 3: Changes to the 2025 Energy Code, Electrical Systems (Lighting, Demand Management, Electrical Distribution)

Building Application	Mandatory		Prescriptive	Performance	Additions and Alterations	Reference Appendices
	All Occupancy Subchapters 1-2 (§§100.0-110.12)	Multifamily Buildings Subchapter 10 (§§160.0-160.9	Subchapter 11 (§§170.0 and 170.2(a)-(h))	Subchapter 11 (§§170.0-1)	Subchapter 12 (§§180.0-4)	
General	§100.0 **Revised** §100.1 **Revised** §100.2 **Revised**	§160.5 ***No Change***	N/A	§§170.0-1 **Revised**	§180.0 ***No Change*** §180.2(b) **Revised**	JA2 Weather/Climate: ***No Change*** JA3 Energy Budget: **Revised**
Demand Management	§110.12 **Revised**	N/A	N/A	N/A	§180.0 ***No Change*** §180.2(b) **Revised**	NA7 Installation/Acceptance: ***No Change***
Electrical Power Distribution System	§110.11 **Revised**	N/A	N/A	N/A	§180.0 ***No Change*** §180.2(b) **Revised**	N/A
Indoor Lighting (conditioned, process spaces)	§110.9 ***No Change***	§§160.5(a)1-2 **Revised**	§170.2(e) **Revised**	§§170.0-1 **Revised**	§180.0 ***No Change*** §180.2(b) **Revised**	JA8 Residential High Efficacy Light: **Revised** JA10 Residential JA8 Flicker: **Revised** NA7 Installation/Acceptance NR: **Revised** NA7.6.5.1 NA8 Default Luminaire Power: ***No Change***
Indoor Lighting (unconditioned, parking garages)	§110.9 ***No Change***	§§160.5(a)1-2 **Revised**	§170.2(e) **Revised**	N/A	§180.0 ***No Change*** §180.2(b) **Revised**	JA8 Residential High Efficacy Light: **Revised** JA10 Residential JA8 Flicker: **Revised** NA7 Installation/Acceptance NR: **Revised** NA7.6.5.1 NA8 Default Luminaire Power: ***No Change***

Table 3: Changes to the 2025 Energy Code, Electrical Systems *(continued)*

Building Application	Mandatory		Prescriptive	Performance	Additions and Alterations	Reference Appendices
	All Occupancy Subchapters 1-2 (§§100.0-110.12)	Multifamily Buildings Subchapter 10 (§§160.0-160.9	Subchapter 11 (§§170.0 and 170.2(a)-(h))	Subchapter 11 (§§170.0-1)	Subchapter 12 (§§180.0-4)	
Outdoor Lighting	§110.9 ***No Change***	§§160.5(a)1-2 **Revised**	§170.2(e)6 ***No Change***	N/A	§180.0 ***No Change*** §180.2(b) **Revised**	JA8 Residential High Efficacy Light: **Revised** JA10 Residential JA8 Flicker: **Revised** NA7 Installation/Acceptance NR: **Revised** NA7.6.5.1 NA8 Default Luminaire Power: ***No Change***
Sign Lighting (indoor and outdoor)	§110.9 ***No Change***	§160.5(a)1-3 ***No Change***	§170.2(e)7 **Revised**	N/A	§180.1(a)3 ***No Change***	N/A

Title 24, Part 1

Article 1 – Energy Building Regulations

› **Mandatory**

› **Section 10-103.1 through 10-103.2 Nonresidential Lighting Controls Acceptance Test Training and Certification**

§10-103.1(c)3F Qualifications and Approval of ATTCPs through 10-103.2(c)3F "Quality Assurance and Accountability"

Revised: Additional requirements have been added in support of auditing.

› **Mandatory**

› **Section 10-114-A Determination of Outdoor Lighting Zones and Administrative Rules for Use**

§10-114-A "Outdoor Lighting Zones"

Revised: Outdoor lighting zones are defined by the 2020 U.S. Census (previously 2010 U.S. Census data).

Subchapter 1 – All Occupancies

General Provisions

› **Mandatory**

› **Section 100.1 Definitions and Rules of Construction**

NEW!: **Daylight Responsive Control** adjusts the luminous flux of the electric lighting system in either a series of steps or by continuous dimming in response to available daylight. This kind of control uses one or more photosensors to detect changes in daylight illumination and then automatically adjusts the electric lighting levels in response.

Revised: **Energy Budget** is the maximum energy consumption, that a proposed building, or portion of a building, can be designed to consume, calculated using Commission-approved compliance software as specified by §10-109 of the Energy Code and the Alternative Calculation Method Reference Manual. The Energy Budget for newly constructed buildings are expressed in terms of the Long-term System Cost (LSC) and Source Energy. The energy budget for Additions and Alterations is expressed in terms of LSC.

NEW!: **Long-term System Cost (LSC)** is the CEC- projected present value of costs to California's energy system over a period of 30 years. LSC does not represent a prediction of individual utility bills.

Revised: **Multilevel Lighting Control** enables the intensity of lighting to be adjusted upward and downward.

NEW!: **OpenADR 3.0, Baseline Profile** is the specific baseline profile defined in the OpenADR Alliance document titled, “OpenADR 3.0 Specification,” 2023.

Revised: **Source Energy** is defined as the long run hourly marginal source energy of fossil fuels that are combusted as a result of building energy consumption either directly at the building site or caused to be consumed to meet the electrical demand of the building considering the long-term effects of Commission-projected energy resource procurement. For a given hour, the value in that hour for each forecasted year is averaged to establish a lifetime average source energy.

Revised: **Temporary Lighting** is a lighting installation, with plug-in connections, that does not persist beyond the time constraints specified **in** California Electrical Code Article 590.

Title 24, Part 6

Subchapter 1 – All Occupancies

General Provisions

› **Mandatory**

› **Section 100.2 Calculation of Energy Budgets**

Revised: When using the Performance Approach for compliance, the energy budget for all newly constructed multifamily buildings is now expressed in terms of Long-term System Cost (LSC) and Source Energy. The energy budgets for Additions and Alterations are expressed in terms of LSC.

LSC is calculated by multiplying the building's annual hourly site energy use for each fuel type by the CEC-published LSC hourly factors, which vary for each hour of the year based on the energy type, CZ, and building type. All depletable energy sources other than electricity and natural gas must use the LSC factors for propane. A summary of LSC hourly factors is found in the Reference Joint Appendix JA3.

Source Energy is calculated by multiplying the annual hourly site energy use by Btu factors for fossil fuel used directly or indirectly at the building site, or to meet the electrical demand of the building.

Title 24, Part 6

Subchapter 2 – All Occupancies

Mandatory Requirements for the Manufacture, Construction and Installation of Systems, Equipment and Building Components

› **Mandatory**

› **Section 110.12 Mandatory Requirements for Demand Management**

§110.12(a) "Demand-responsive Controls"

Revised: All demand-responsive controls shall be either a certified OpenADR 2.0a or OpenADR 2.0b Virtual End Node (VEN); a certified Baseline Profile OpenADR 3.0 VEN; or certified to the CEC as being capable of responding to a demand response signal from a certified OpenADR 2.0b or a certified Baseline Profile OpenADR 3.0 VEN by automatically implementing the control functions requested by the VEN for the equipment it controls.

› **Mandatory**

› **Section 160.5 Mandatory Requirements for Indoor and Outdoor Spaces**

§160.5(a) — Dwelling Unit "Dwelling Unit Lighting"

Revised: All changes are in support of clean-up with no substantive changes.

§160.5(b)4A — Common Use Area "Indoor Lighting — Manual Controls"

Revised: Manual controls shall be located within the same space of the controlled lighting, or in a location where the status of the controlled lighting can be seen when operating the controls (annunciated). This requirement applies to all space types, whereas it was previously limited to only some space types. Egress manual controls shall not be controllable by unauthorized personnel during a power failure.

§160.5(b)4B — Common Use Area "Indoor Lighting — Multilevel Lighting Controls"

Revised: When required — for spaces that are larger than or equal to 100 ft² with general lighting exceeding 0.5 watts per ft², unless there is only one luminaire, or it is a restroom or healthcare facility — multilevel lighting controls shall provide and enable continuous dimming from 100% to 10%, unless using high-intensity discharge (HID) technology for general lighting, in which at least one control step between 30 and 70% of full rated power is required. Table 160.5-B "Multilevel Lighting Controls and Uniformity Requirements" has been removed, since required control steps have been included in applicable code language.

§160.5(b)4C — Common Use Area "Indoor Lighting — Shut-off Controls"

Revised: Occupant sensor control zones for offices larger than 250 ft² are required to be shown on the lighting plans. All other changes in this section support clean-up efforts with no substantive changes.

§160.5(b)4D — Common Use Area "Indoor Lighting — Daylight Responsive Controls"

Revised: Enclosed space(s) designed with at least 75 watts of general lighting in the total skylit zone(s), or total primary sidelit zones(s) or total secondary sidelit daylit zone(s) must control the general lighting within those zones with daylight responsive controls. When an enclosed space has at least 85 watts of general lighting in the secondary sidelit zone(s) only (none in skylit or primary daylit zones), then the general lighting in the secondary daylit zone is required to use daylight responsive controls. For parking garages, the threshold for daylight responsive controls remains at least 60 watts in primary and secondary sidelit zones combined. All other changes in this section support clean-up efforts with no substantive changes.

› **Mandatory**

› **Section 160.5 Mandatory Requirements for Indoor and Outdoor Spaces** *(continued)*

§160.5(b)4F — Common Use Area "Indoor Lighting Occupancy Sensing Controls Interactions with Space-conditioning Systems"

Revised: Control interactions have been incorporated within the specific control requirements of §160.5(b)4 and replaced with a duplication of the requirements of §160.2(c)5D "Occupied-standby Zone Controls," in which ventilation air shall be reduced to zero when the space is in occupied-standby mode and the space-conditioning system is controlled by occupancy sensing controls. This applies when ventilation is allowed to be reduced to zero air per Table 160.2-B "Minimum Ventilation Rates" AND the space is required to provide occupancy sensor lighting controls per §160.5(b)4Cv "Occupant Sensing Controls are required for specified offices, multipurpose rooms, classrooms, conference rooms and restrooms" or §160.5(b)4Cvi "Full or Partial OFF occupant sensing controls are required for aisle ways and open area in warehouses, library book stack aisles, corridors and stairwells, and offices > 250 ft².".

§160.5(c)1 "Outdoor Lighting Luminaire Shielding Requirements"

Revised: A **new exception** has been added to align Energy Code exceptions with CalGreen (Title 24, Part 11) exceptions found in §5.106.8. Additionally, any luminaires eligible for the exceptions of §170.2(e)6A "Prescriptive Requirements for Outdoor Lighting" are also exempt to these Luminaire Shielding Requirements (otherwise known as "BUG" Backlit, Uplight and Glare Ratings).

§160.5(c)2B "Outdoor Lighting — Automatic Scheduling Controls"

Revised: All changes in this section support clean-up of code language with no substantive changes.

› **Mandatory**

› **Section 160.9 Mandatory Requirements for Electric-ready Buildings**

§160.9(a) "General Requirements"

NEW!: The building electrical system shall be sized to meet the future electric requirements of the electric-ready equipment specified in §160.9. The building main service conduit, the electrical system to the point specified in each subsection and any on-site distribution transformers shall have sufficient capacity to supply full rated amperage at each electric-ready appliance in accordance with the California Electrical Code.

› **Mandatory**

› **Section 160.9 Mandatory Requirements for Electric-ready Buildings** *(continued)*

§160.9(e) "Individual Heat Pump Water Heater Ready"

NEW!: Systems using gas or propane water heaters to serve individual dwelling units shall include the following components for each gas or propane water heater:

Electrical: A dedicated 125-volt, 20-amp electrical receptacle that is connected to the electric panel with a 120/240-volt, three conductor branch circuit rated to 30 amps minimum, within three feet from the water heater and accessible to the water heater with no obstructions; Both ends of the unused conductor shall be labeled with the word "spare" and be electrically isolated; A reserved single pole circuit breaker space in the electrical panel adjacent to the circuit breaker for the branch circuit and labeled with the words "Future 240V Use"; A condensate drain that is no more than two inches higher than the base of the installed water heater, and allows natural draining without pump assistance; Construction drawings shall designate a space at least 39" by 39" and 96" tall for the future location of the heat pump water heater.

Ventilation:

- A minimum volume of 700 ft^3 to accommodate the space for a future heat pump water heater, **or**
- If venting to the indoors, the space for the future heat pump water heater must vent to a communicating space in the same pressure boundary, with the total combined volume connected via permanent openings must vent to the interior via one of the three options:
  - A fully louvered door with fixed louvers consisting of a single layer of fixed flat slats and a minimum total net free area (NFA) of 250 in^2, **or**
  - With two permanent openings of equal area with a minimum total NFA of 250 in^2 located within 12" from the enclosure top and bottom, **or**
  - Two 8" ducts to a communicating space
- If venting to the exterior, the designated space for the future heat pump water heater must vent to the exterior via one of the three options below:
  - A fully louvered door with fixed louvers consisting of a single layer of fixed flat slats and a minimum total net free area (NFA) of 250 in^2, **or**
  - With two permanent openings of equal area with a minimum total NFA of 250 in^2 located within 12" from the enclosure top and bottom, **or**
  - With two 8" capped ducts, where all ducts that cross the pressure boundary shall be insulated to a minimum insulation level of R-6 and the ducts, connections, and building penetrations shall be sealed.

› **Mandatory**

› **Section 160.9 Mandatory Requirements for Electric-ready Buildings** *(continued)*

§160.9(f) "Central Heat Pump Water Heater Ready"

NEW!: Central water heating systems using gas or propane to serve multiple dwelling units shall meet the following requirements with the system input capacity of the gas or propane water heating system, determined as the sum of the gas or propane capacity of all water heating devices associated with each gas or propane water heating system:

- **Space Reserved:**
  - **Heat Pump:** The minimum space reserved shall include space for service and air flow clearances and shall be either the space required for a heat pump water heater system that meets the total building hot water demand as calculated and documented by the responsible person associated with the project, or per JA15.2.1.
  - **Tanks:** The minimum space reserved shall include space for service clearances and shall be either the space required for a heat pump water heater system that meets the total building hot water demand as calculated and documented by the responsible person associated with the project, or per JA15.2.2.
- **Ventilation:** Ventilation shall be provided by either reserving the physical space for the future heat pump outside, or via a pathway reserved for future routing of supply and exhaust air. This shall be planned and identified for future use on the plan set. The reserved pathway and penetrations through the building envelope are to be sized to meet either, a reserved pathway and penetrations sized to serve a heat pump water heater system that meets the total building hot water demand as calculated and documented by the responsible person associated with the project, or per JA15.2.3.
- **Condensate Drainage Piping:** An approved receptacle that is sized per the California Plumbing Code for condensate drainage shall be installed within three feet of the reserved heat pump location. Alternatively, piping may be installed from within three feet of the reserved heat pump location to an approved discharge location that is sized in accordance with the California Plumbing Code, and meet either drainage sizing to serve a heat pump water heater system that meets the total building hot water demand as calculated and documented by the responsible person associated with the project, or per JA15.2.4.
- **Electrical:** Physical space shall be reserved on the bus system of the main switchboard or on the bus system of a distribution board to serve the future heat pump water heater system, including the heat pump and temperature maintenance tanks. Additional physical space shall be reserved to provide adequate power to the future heat pump water heater, sized based on the electrical power required to meet the total building hot water demand, as calculated and documented by the responsible person associated with the project, or per JA15.2.5. Additional physical space shall be reserved for the electrical power required to power a heat pump water heater system temperature maintenance tank that meets the total building hot water demand, as calculated and documented by the responsible person associated with the project, or per JA15.2.5

Subchapter 11 – Multifamily Occupancies

Performance and Prescriptive Compliance Approaches for Achieving Energy Efficiency

› Performance

› Section 170.1 Performance Approach: Energy Budgets

§170.1(a) "Performance Approach"

Revised: Proposed Design building to be no greater than the energy budget calculated for the Standard Design building using CEC-certified compliance software as specified by §10-109(c) "Compliance Software" and §10-116 "Third Party Alternative Calculation Method Compliance Software."

Energy Budget. The energy budget is expressed in terms of long-term system cost and source energy.

- **LSC.** The LSC energy budget is determined by applying the Mandatory and Prescriptive Requirements of the Standard Design to the Proposed Design building and has two components, the **Efficiency LSC** and the **Total LSC**. The **Efficiency LSC** energy is the sum of the LSC energy for space-conditioning, water-heating, mechanical ventilation, and self-utilization credit(s). **Total LSC** energy is the sum of the Efficiency LSC energy and LSC energy from the PV system, BESS, lighting, demand flexibility, and other plug loads.
- **Source Energy.** Source Energy reflects the long run marginal source energy of fossil fuels that are combusted as a result of building energy consumed either directly at the building site or to meet the electrical demand of the building.

› Prescriptive

› Section 170.2 Prescriptive Approach

§170.2(e)2Bixe — Common Use Area "Indoor Lighting PAF for Occupant Sensing Control of Open Offices"

Revised: Occupant sensor control zones for offices larger than 250 ft² are required to be shown on the lighting plans.

§170.2(e)2Diii — Common Use Area "Indoor Lighting Luminaire Classification and Power Adjustment Tailored Method"

Revised: The Tailored Method has been removed as a compliance method and all wattage allowances supported in the Tailored Method have been added as "Additional Power Allowances" within the Area Category Approach.

§170.2(e)4 — Common Use Area "Indoor Lighting Calculation of Allowed Indoor Lighting Power: Specific Methodologies"

Revised: The Tailored Method has been removed as a compliance method and all wattage allowances supported in the Tailored Method have been added as "Additional Power Allowances" within the Area Category Approach.

› **Prescriptive**

› **Section 170.2 Prescriptive Approach**

§170.2(e)7B — Common Use Area "Signs Alternate Light Sources"

Revised: When a sign is equipped with one of the following, then the wattage limitation for signs does not apply:

- Neon or cold cathode lamps with transformer or power supply efficiency greater than or equal to the following:
  - A minimum efficiency of 75% when the transformer or power supply-rated output current is less than 50 mA; **or**
  - A minimum efficiency of 68% when the transformer or power supply-rated output current is at least 50 mA.

  The ratio of the output wattage to the input wattage is at 100% tubing load.
- Light emitting diodes (LEDs) with a power supply having an efficiency of ≥ 80%.
  - **Exception:** Single voltage external power supplies that are designed to convert 120-volt AC input into lower voltage DC or AC output and have a nameplate output power no greater than 250 watts, shall comply with the applicable requirements of the Appliance Efficiency Regulations (Title 20).

Photovoltaic, Battery Storage Systems, Solar and Battery Readiness: Multifamily Occupanices

Table 4: Changes to the 2025 Energy Code, Photovoltaic, Battery Storage Systems, and Solar Readiness

Building Application	Mandatory		Prescriptive	Performance	Additions and Alterations	Reference Appendices
	All Occupancy Subchapters 1-2 (§§100.0-110.12)	Subchapter 10 (§§160.0-160.9)	Subchapter 11 (§§170.0 and 170.2(a)-(h))	Subchapter 11 (§§170.0-1)	Subchapter 12 (§§180.0-4)	
General	§100.0 **Revised** §100.1 **Revised** §100.2 **Revised**	§160.8 ***No Change***	N/A	§§170.0-1 **Revised**	N/A	JA2 Weather/Climate: ***No Change*** JA3 Energy Budget: **Revised**
Photovoltaic (PV) and Battery Energy Storage Systems	N/A	N/A	§170.2(f) **Revised** §170.2(g) **Revised** §170.2(h) **Revised**	§§170.0-1 **Revised**	N/A	JA11 PV Qualifications: ***No Change*** JA12 Battery Qualifications: **Revised**
Solar Readiness	§110.10 ***No Change***	N/A	N/A	N/A	Additions §110.10 ***No Change***	N/A

Title 24, Part 1

Article 1 – Energy Building Regulations

› **Mandatory**

› **Section 10-115 Community Shared Solar Electric Generation System or Community Shared Battery Energy Storage System Compliance Option for On-Site Solar Electric Generation or Battery Energy Storage Requirements**

§10-115(a)6 "Community-shared Solar Electric Generation System or Battery Energy Storage System Offset – Location"

Revised: The community shared solar electric generation system and/or community shared BESS shall be located on a distribution system of the load serving entity providing service to the participating buildings. The distribution system must have an electrical voltage less than 100kV.

› **Mandatory**

› **Section 100.1 Definitions and Rules of Construction**

NEW!: **BESS Ready Interconnection Equipment** is equipment, including but not limited to a Battery Energy Storage System (BESS) ready panelboard or switchboard, that can accommodate the connection of a distributed energy resource or a BESS capable of either automatic or manual isolation from the utility power source.

NEW!: **BESS Ready Panelboard/Switchboard** is a panelboard or switchboard that can accommodate either automatic or manual switching between a utility power source to a distributed energy resource or a BESS, such as a split bus panelboard or a switchboard.

Revised: **Energy Budget** is the maximum energy consumption, that a proposed building, or portion of a building, can be designed to consume, calculated using Commission-approved compliance software as specified by §10-109 of the Energy Code and the Alternative Calculation Method Reference Manual. The Energy Budget for newly constructed buildings are expressed in terms of the Long-term System Cost (LSC) and Source Energy. The energy budget for Additions and Alterations is expressed in terms of LSC.

NEW!: **Executive Director** is the Executive Director of the Energy Commission.

NEW!: **Long-term System Cost (LSC)** is the CEC-projected present value of costs to California's energy system over a period of 30 years. LSC does not represent a prediction of individual utility bills.

Revised: **Nonresidential Building Types** is no longer dependent upon minimum floor area of one Building Type versus another. The following are new building types added to support the PV requirements on the Energy Code:

- **NEW!:** **Events & Exhibits Building** is a Museum Building, Motion Picture or Performance Arts Theater Building, or other building that is comprised of Auditorium Area, Convention, Conference, Multipurpose and Meeting Area, or Civic Meeting Place Area.
- **NEW!:** **Religious Worship Building** is a building that is comprised of Religious Worship Area.
- **NEW!:** **Sports & Recreation Building** is a building that is comprised of Exercise/Fitness Center and Gymnasium Area, or other area where recreational sports are practiced.
- **NEW!:** **Warehouse Building** is a building that is constructed for storage or handling of products.

NEW!: **Power Conditioning System (PCS)** is a device, which may be either integrated into a Battery Energy Storage System (BESS) or standalone, that allows for the BESS to interact with other electrical infrastructure, such as the electrical network. The PCS may include an inverter like that used for a photovoltaic (PV) system.

NEW!: **Recovered Energy, On-Site** is recovered energy that is captured at the building site.

Revised: **Source Energy** is defined as the long run hourly marginal source energy of fossil fuels that are combusted as a result of building energy consumption either directly at the building site or caused to be consumed to meet the electrical demand of the building considering the long-term effects of Commission-projected energy resource procurement. For a given hour, the value in that hour for each forecasted year is averaged to establish a lifetime average source energy.

Title 24, Part 6

Subchapter 1 – All Occupancies

General Provisions

› **Mandatory**

› **Section 100.2 Calculation of Energy Budgets**

Revised: When using the Performance Approach for compliance, the energy budget for all newly constructed multifamily buildings is now expressed in terms of Long-term System Cost (LSC) and Source Energy. The energy budgets for Additions and Alterations are expressed in terms of LSC.

LSC is calculated by multiplying the building's annual hourly site energy use for each fuel type by the CEC-published LSC hourly factors, which vary for each hour of the year based on the energy type, CZ, and building type. All depletable energy sources other than electricity and natural gas must use the LSC factors for propane. A summary of LSC hourly factors is found in the Reference Joint Appendix JA3.

Source Energy is calculated by multiplying the annual hourly site energy use by Btu factors for fossil fuel used directly or indirectly at the building site, or to meet the electrical demand of the building.

Title 24, Part 6

Subchapter 11 – Multifamily Occupancies

Performance and Prescriptive Compliance Approaches for Achieving Energy Efficiency

› **Performance**

› **Section 170.1(a) Performance Approach**

§170.1(a) "Energy Budget"

Revised: Proposed Design building to be no greater than the energy budget calculated for the Standard Design building using CEC-certified compliance software as specified by §10-109(c) "Compliance Software" and §10-116 "Third Party Alternative Calculation Method Compliance Software."

Energy Budget. The energy budget is expressed in terms of LSC and source energy.

- **LSC.** The LSC energy budget is determined by applying the Mandatory and Prescriptive Requirements of the Standard Design to the Proposed Design building and has two components, the **Efficiency LSC** and the **Total LSC**. The **Efficiency LSC** energy is the sum of the LSC energy for space-conditioning, water-heating, mechanical ventilation, and self-utilization credit(s). **Total LSC** energy is the sum of the Efficiency LSC energy and LSC energy from the PV system, BESS, lighting, demand flexibility, and other plug loads.
- **Source Energy.** Source Energy reflects the long run marginal source energy of fossil fuels that are combusted as a result of building energy consumed either directly at the building site or to meet the electrical demand of the building.

› **Prescriptive**

› **Section 170.2 Prescriptive Approach**

§170.2(f) "Photovoltaic Requirements — three habitable stories or fewer"

Revised: When considering the Solar Access Roof Area (SARA) method, low-sloped roofs (less than 2:12) are multiplied by 14 watts. Steep-sloped roofs (2:12 or greater) are now included in SARA, in which the area is multiplied by 18 watts. There are no major changes to the rest of this code section including Equation 170.2-C "Annual Photovoltaic Electrical Output" nor to Table 170.2-T "CFA and Dwelling Unit Adjustment Factors." To determine minimum required PV kW requirements, the smaller of either SARA or Equation 170.2-C (or the Performance Approach, if selected as the alternative compliance method) is used.

§170.2(g) "Photovoltaic Requirements — more than three habitable stories"

Revised: When considering the Solar Access Roof Area (SARA) method, low-sloped roofs (less than 2:12) are multiplied by 14 watts. Steep-sloped roofs (2:12 or greater) are now included in SARA, in which the area is multiplied by 18 watts. One of the alternative approaches uses the conditioned floor area for Equation 170.2-D "Photovoltaic Direct Current Capacity" specific to the building type and Climate Zone supported in Table 170.2-U "PV Capacity Factors," in which many of the capacity factors for other building types have been revised, but not for multifamily buildings with four or more habitable stories. To determine minimum required PV kW requirements, the smaller of either SARA or Equation 170.2-D (or the Performance Approach, if selected as the alternative compliance method) is used.

Equation 170.2-D "Photovoltaic Direct Current Capacity"

kWPVdc = (CFA x A)/1000

WHERE:

kWPVdc = Minimum rated PV system capacity in kW.

CFA = Conditioned floor area in square feet.

A = PV capacity factor in W/square foot as specified in Table 170.2-U for the building type.

The 2022 Virtual Net Energy Metering (VNEM) exception #5 (Exceptions 1 through 4 remain unchanged from the 2022 Energy Code) has been revised in which multifamily buildings with four or more stories are not subject to the PV requirements unless the CEC has approved a community solar program per Title 24, Part 1, §10-115 that can serve the building, or where a load-serving entity provides a program where PV generation is compensated through virtual energy bill credits.

› Prescriptive
› Section 170.2 Prescriptive Approach

§170.2(g) "Photovoltaic Requirements — more than three habitable stories" *(continued)*

Table 170.2-U – PV Capacity Factors (W/ft² of conditioned floor area)

Building Type	CZ1	CZ2	CZ3	CZ4	CZ5	CZ6	CZ7	CZ8
NEW!: Events & Exhibits	3.48 Revised	4.28 Revised	3.66 Revised	4.32 Revised	3.77 Revised	4.05 Revised	4.28 Revised	4.83 Revised
Library	0.39	3.23 Revised	2.59 Revised	3.25 Revised	2.48 Revised	2.74	3.04 Revised	3.49 Revised
Hotel/Motel	1.69 Revised	1.90 Revised	1.66 Revised	1.97 Revised	1.69 Revised	1.87 Revised	1.94 Revised	2.22 Revised
Office, Financial Institution, Unleased Tenant Space NEW!: Medical Office Building/Clinic	2.59	3.13	2.59	3.13	2.59	3.13	3.13	3.13
Restaurants	8.55 Revised	9.32 Revised	8.16 Revised	9.65 Revised	8.21 Revised	8.73 Revised	9.11 Revised	10.18 Revised
Retail, Grocery	3.14 Revised	3.49 Revised	3.01 Revised	3.61 Revised	3.05 Revised	3.27 Revised	3.45 Revised	3.83 Revised
School	1.27	1.63	1.27	1.63	1.27	1.63	1.63	1.63
Warehouse	0.39	0.44	0.39	0.44	0.39	0.44	0.44	0.44
NEW!: Religious Worship	4.25 Revised	4.65 Revised	3.49 Revised	4.52 Revised	3.72 Revised	4.29 Revised	4.64 Revised	5.89 Revised
NEW!: Sports & Recreation	2.47 Revised	1.97 Revised	1.54 Revised	2.03 Revised	1.60 Revised	1.84 Revised	1.98 Revised	2.63 Revised
Multifamily > 3 stories	1.82	2.21	1.82	2.21	1.82	2.21	2.21	2.21

› Prescriptive
› Section 170.2 Prescriptive Approach

§170.2(g) "Photovoltaic Requirements — more than three habitable stories" *(continued)*

Table 170.2-U – PV Capacity Factors (W/ft² of conditioned floor area)

Building Type	CZ9	CZ10	CZ11	CZ12	CZ13	CZ14	CZ15	CZ16
NEW!: Events & Exhibits	4.63 Revised	4.80 Revised	5.04 Revised	4.44 Revised	4.95 Revised	4.36 Revised	5.48 Revised	3.38 Revised
Library	3.32 Revised	3.69 Revised	3.79 Revised	3.32 Revised	3.79 Revised	3.37 Revised	4.49 Revised	2.84 Revised
Hotel/Motel	2.09 Revised	2.20 Revised	2.30 Revised	2.05 Revised	2.30 Revised	2.02 Revised	2.72 Revised	1.73 Revised
Office, Financial Institution, Unleased Tenant Space Revised: Medical Office Building/Clinic[1]	3.13	3.13	3.13	3.13	3.13	3.13	3.80	2.59
Restaurants	9.75 Revised	10.28 Revised	10.85 Revised	9.73 Revised	10.69 Revised	9.73 Revised	12.25 Revised	8.47 Revised
Retail, Grocery	3.65 Revised	3.81 Revised	4.09 Revised	3.64 Revised	3.99 Revised	3.71 Revised	4.60 Revised	3.21 Revised
School	1.63	1.63	1.63	1.63	1.63	1.63	2.46	1.27
Warehouse	0.44	0.44	0.44	0.44	0.44	0.44	0.58	0.39
Revised: Religious Worship[1]	5.30 Revised	5.67 Revised	5.89 Revised	4.99 Revised	5.78 Revised	4.63 Revised	7.57 Revised	3.90 Revised
Sports & Recreation	2.47 Revised	2.60 Revised	2.75 Revised	2.20 Revised	2.72 Revised	2.15 Revised	4.03 Revised	1.81 Revised
NEW!: Multifamily > 3 stories	2.21	2.21	2.21	2.21	2.21	2.21	2.77	1.82

[1]This is not a new building type, but has been put in a different category that changes the minimum requirements.

› **Prescriptive**

› **Section 170.2 Prescriptive Approach**

§170.2(h) "Battery Energy Storage System (BESS) Requirements — more than three habitable stories"

Revised: Battery energy storage system energy storage sizing requirements will depend on how the PV is calculated. If the SARA was used, then Equation 170.2-F "Battery Energy Storage System Minimum Rated Usable Energy Capacity SARA-Adjusted" is used. If Equation 170.2-D "Photovoltaic Direct Current Capacity" was used to size the PV system, then Equation 170.2-E "Battery Energy Storage System Minimum Rated Usable Energy Capacity" is used. The factors in Table 170.2-V "BESS Capacity Factors (Wh/ft² of conditioned floor area)" have been increased for multifamily buildings with four or more stories.

Equation 170.2-E "Battery Energy Storage System Minimum Rated Usable Energy Capacity"

$kWh_{batt} = ((CFA \times B)/(1000 \times C^{0.5}))$

Equation 170.2-F "Battery Energy Storage System Minimum Rated Usable Energy Capacity *SARA-Adjusted*"

$kWhbatt = ((CFA \times B)/(1000 \times C^{0.5})) \times (kW_{PVdc,SARA}/kW_{PVdc})$

WHERE:

$kWh_{batt,}$ = Minimum Rated Useable Energy Capacity of the BESS in kWh.

CFA = Conditioned floor area (ft²) that is subject to the PV system requirements of §140.10(a).

$kW_{PVdc,}$ = Minimum Rated PV System Capacity in kW from Equation 140.10-A.

$kW_{PVdc,\ SARA}$ = Minimum Rated PV System Capacity in kW from the SARA calculation.

B = BESS Capacity Factor in Wh/ft² as specified in Table 140.10-B for the building type.

C = Rated single charge-discharge cycle AC to AC (round-trip) efficiency of the BESS.

› Prescriptive
› Section 170.2 Prescriptive Approach

§170.2(h) "Battery Energy Storage System (BESS) Requirements — more than three habitable stories" *(continued)*

Revised: Table 170.2-V — BESS Capacity Factors (Wh/ft² of conditioned floor area)*

Building Type	CZ1	CZ2	CZ3	CZ4	CZ5	CZ6	CZ7	CZ8	CZ9	CZ10	CZ11	CZ12	CZ13	CZ14	CZ15	CZ16
NEW!: Events and Exhibits	1.82	1.95	1.74	2.12	1.91	2.13	2.24	2.30	2.36	2.47	2.62	2.16	2.64	2.68	3.22	1.89
Library	0.37	7.17	5.97	6.75	5.64	6.08	6.19	7.13	7.18	7.56	7.17	6.93	6.88	6.81	7.93	6.40
Hotel/Motel	0.86	0.84	0.77	0.92	0.81	0.89	0.90	1.01	1.00	1.11	1.14	0.96	1.18	1.18	1.49	0.85
Office, Financial Institution, Unleased Tenant Space Revised: Medical Office Building/Clinic[1]	NR	5.26	4.35	5.26	4.35	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	5.26	6.39	4.35
Restaurants	4.36	4.11	3.78	4.37	3.89	4.02	4.11	4.49	4.47	4.82	5.05	4.43	5.05	5.24	6.23	4.11
Retail, Grocery	1.89	1.82	2.70	1.82	1.72	1.80	1.76	1.92	1.97	2.05	2.22	1.95	2.16	2.29	2.66	1.91
School	NR	3.05	2.38	3.05	2.38	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	3.05	4.60	2.38
NEW!: Warehouse	0.37	0.41	0.37	0.41	0.37	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.54	0.37
Revised: Religious Worship[1]	2.21	2.25	1.74	2.42	2.08	2.75	2.94	3.37	3.17	3.37	3.58	2.72	3.62	3.21	4.89	2.37
Sports and Recreation	1.26	0.98	0.76	1.14	0.86	1.20	1.23	1.57	1.53	1.65	1.83	1.27	1.86	1.57	3.02	1.13
Multifamily > 3 stories	1.88	2.27	1.88	2.27	1.88	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.27	2.85	1.88

[1]This is not a new building type, but has been put in a different category that changes the minimum requirements.

*Everything in this table has been revised.

NR = No Requirement

› **Prescriptive**

› **Section 170.2 Prescriptive Approach**

§170.2(h) "Battery Energy Storage System (BESS) Requirements — more than three habitable stories" *(continued)*

Revised: Additionally, battery power capacity sizing will be required per Equation 140.10-D "BESS Minimum Rated Power Capacity"

Equation 170.2-G "BESS Minimum Rated Power Capacity"

$kW_{batt} = kWh_{batt} / 4$

WHERE:

kW_{batt} = Minimum Rated Power Capacity of the BESS in kWdc

kWh_{batt} = Minimum Rated Usable Energy Capacity of the BESS in kWh

Exceptions have been updated:

Exception: No BESS is required if the installed PV system capacity is less than 15% of the capacity determined by Equation 170.2-G "Photovoltaic Direct Current Capacity."

Exception: No BESS is required if the minimum rated usable energy capacity determined by Equation 170.2-E "Battery Energy Storage System Minimum Rated Usable Energy Capacity" or Equation 170.2-F "Battery Energy Storage System Minimum Rated Usable Energy Capacity **SARA-Adjusted**" is less than 10 kWh.

For More Information

EnergyCodeAce™

energycodeace.com

Your "one-stop-shop" for no-cost tools, training, and resources to help you comply with California's Building Energy Efficiency Standards (Title 24, Part 6) and Appliance Efficiency Standards (Title 20).

Create an account on the EnergyCodeAce.com website and select an industry role for your profile in order to receive our newsletter and messages about all our offerings!

Did you know you can get your questions answered by an industry expert?

Use our "Submit a Question" option on our website to connect with our team or scroll through **Q&Ace** to find answers to commonly asked questions.

Ace Tools™

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Explore this suite of interactive tools to understand the compliance process, required forms, installation techniques, and efficiency regulations in California.

- Reference Ace: Navigate Title 24, Part 6 using an index, keyword search, and hyperlinked text.
- Q&Ace: Search our online knowledge base or submit your question to Energy Code Ace experts.
- Product Finder: Find Title 24, Part 6 compliant products.
- Virtual Compliance Assistant: Get interactive help to fill in NRCC or LMCC Forms.

Ace Training™

energycodeace.com/training

On-demand, live in-person, and online training alternatives are tailored to a variety of industry professionals and address key measures.

Of special interest:

- 2025 Title 24, Part 6 Essentials – Residential Standards: What's New
- 2025 Title 24, Part 6 Essentials – Nonresidential Standards: What's New

Ace Resources™

energycodeace.com/resources

Downloadable materials provide practical and concise guidance on how and when to comply with Title 24, Part 6 and Title 20.

Of special interest:

- Fact Sheets for Buildings
  - » Coming soon – search for "multifamily buildings" on our website for new 2025 resources
- Fact Sheets for Appliances
  - » MAEDbS 101

CALIFORNIA ENERGY COMMISSION

California Energy Commission (CEC)
energy.ca.gov

Learn more about the CEC and its programs.

- 2025 Building Energy Efficiency Standards: Explore the main CEC web portal for the 2025 Energy Code, including information, documents, and historical information.
- 2025 California Energy Code Fact Sheet: Download this brief summary of the Title 24, Part 6 purpose, current changes, and impact.
- California Appliance Efficiency Standards Site: Visit this site for information on California's Title 20 Appliance Efficiency Regulations.
- **Energy Code Hotline**
  - » Call: 1-800-772-3300 (Free)
  - » Submission Form
- Energy Code Support Center: Use these online resources developed for building and enforcement communities to learn more about Title 24, Part 6.
- Modernized Appliance Efficiency Database System (MAEDbS): Search this database to find products that comply with Title 24, Part 6 and Title 20.

Additional Resources

Title 24 Stakeholders
title24stakeholders.com

The Codes and Standards Enhancement (CASE) initiative presents recommendations to support the CEC's efforts to update Title 24, Part 6) to include new requirements or to upgrade existing requirements for various technologies. Three California investor-owned utilities sponsor this effort. The Statewide CASE Team encourages the open exchange of comments and concerns from all stakeholders engaged in the Title 24, Part 6 code change process. Contact them and they will put you in touch with the appropriate CASE Team members.

Reach Codes
localenergycodes.com

Collaborating with cities, counties, and stakeholders to drive reach code development and adoption for long-term climate and energy efficiency benefits. View a list of adopted ordinances at the link provided.

CALGreen
calgreeninfo.com

CALGreen is a mandatory green building code with additional voluntary provisions. CALGreen is Part 11 of the California Building Standards Code, Title 24 of the California Code of Regulations. Codes are updated and adopted on an 18-month cycle, triennial and intervening. The current code is effective through December 31, 2025.

EnergyCodeAce™ SDGE™ Southern California Edison® Energy for What's Ahead® Pacific Gas and Electric Company®

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