TRI-COUNTY
REGIONAL ENERGY NETWORK
SAN LUIS OBISPO • SANTA BARBARA • VENTURA

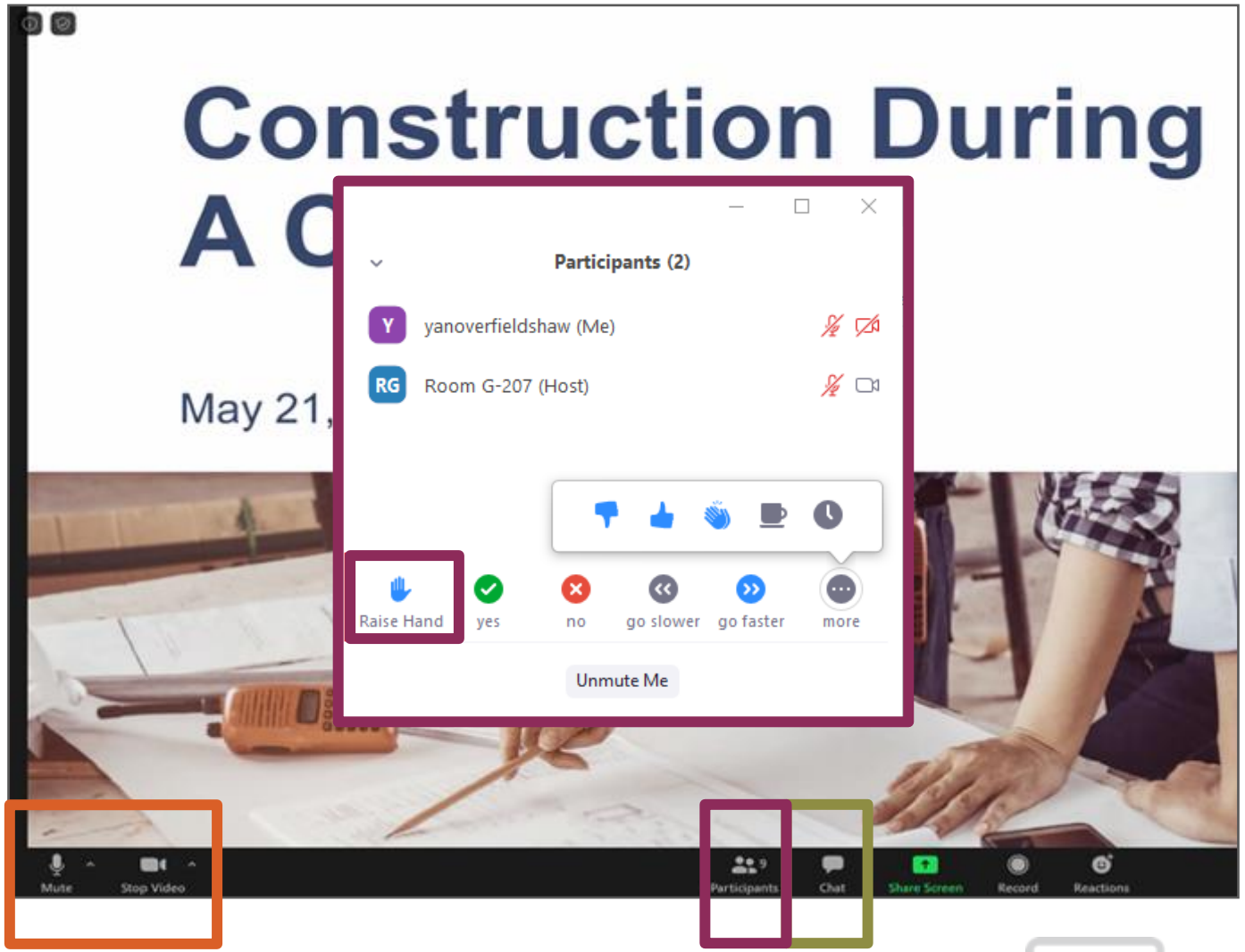
Multifamily: Energy Code Implementation Series, with 2025 Code Updates

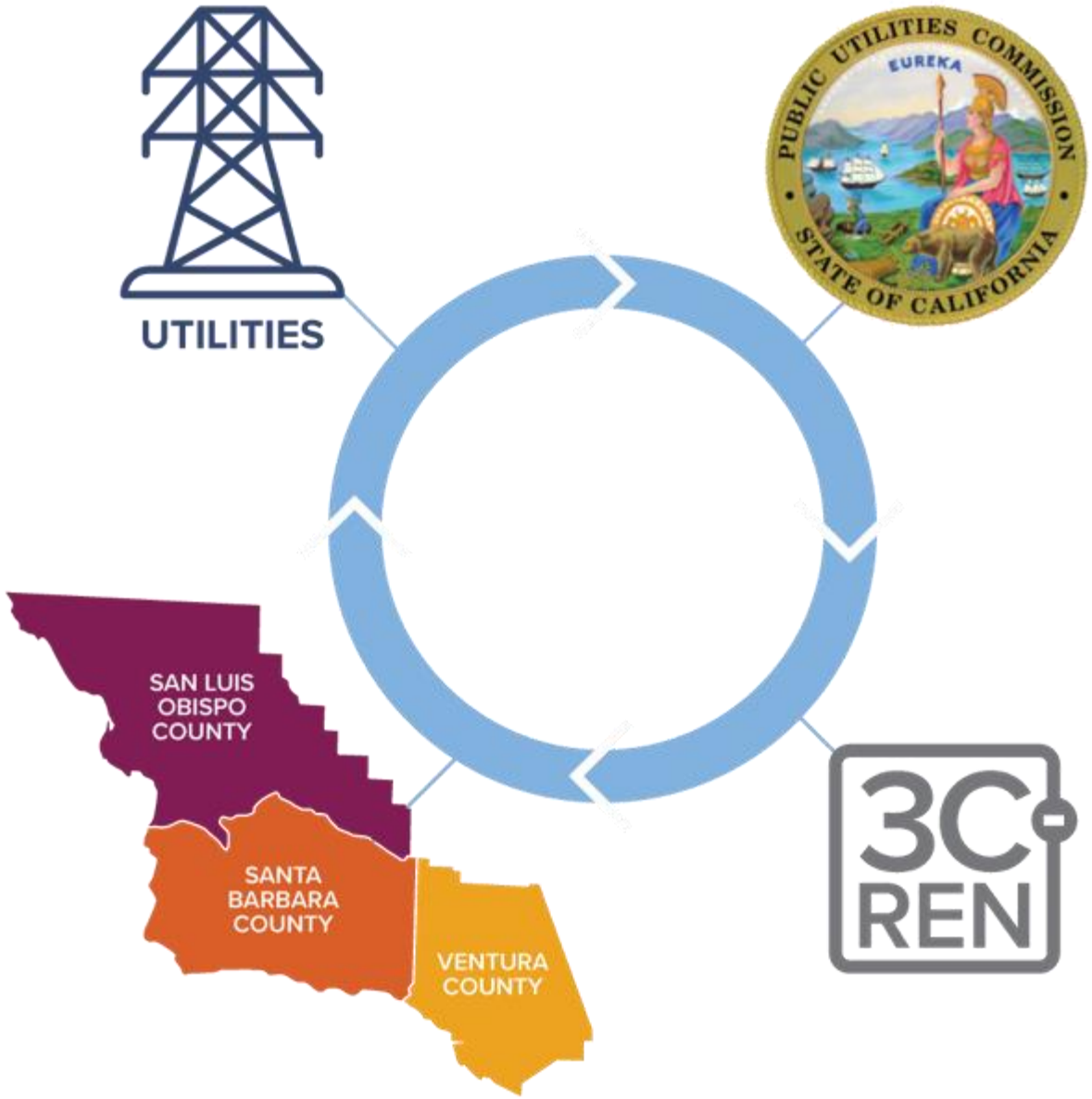
Jennifer Rennick & Grant Murphy – In Balance Green Consulting

July 23, 2025

Zoom Orientation

- Add an **introduction** in the chat.
  Be sure **full name** is displayed.
- Did you call in? Please **share** first and last name with us.
- Please **mute** upon joining
- Use the "**Chat**" to share questions or comments
- Under "**Participant**" select "**Raise Hand**" to share a question or comment verbally
- Session may be **recorded** and posted to 3C-REN's on-demand page
- Slides/recording are **shared** after most events
- 3C-REN does **not** allow **AI notetakers**, unless used to accommodate a disability.





Tri-County Regional Energy Network

3C-REN is a collaboration between the tri-counties

Our programs reduce energy use for a more sustainable, equitable and economically vibrant Central Coast

Our free services are funded via the CPUC, bringing ratepayer dollars back to the region

Our Services

Incentives

HOME ENERGY SAVINGS

3c-ren.org/for-residents
3c-ren.org/multifamily

COMMERCIAL ENERGY SAVINGS

3c-ren.org/commercial

Contractors can enroll at
3c-ren.org/contractors

Training

BUILDING PERFORMANCE TRAINING

3c-ren.org/events
3c-ren.org/building

ENERGY CODE CONNECT

3c-ren.org/code

View past trainings at
3c-ren.org/on-demand

Technical Assistance

AGRICULTURE ENERGY SOLUTIONS

3c-ren.org/agriculture

ENERGY ASSURANCE SERVICES

3c-ren.org/assurance

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Energy Code Implementation Series

This series focuses on current best practices for implementation of energy strategies, as well as what's around the corner with the new code that will take effect Jan. 1, 2026. With particular focus on the Central Coast region, we'll discuss on what to include in construction documents to streamline the permitting process and tips for construction to ease signoffs and occupancy for each building type:

- Energy Code Implementation: Non-Residential
- Energy Code Implementation: Single Family New Construction
- Energy Code Implementation: Single Family Additions and Alterations
- Energy Code Implementation: ADUs
- ***Energy Code Implementation: Multi-Family***

https://www.3c-ren.org/calendar-of-events-and-trainings/

Today's Learning Objectives

- Understand the current and upcoming metrics and standards used in the energy code for evaluating energy performance and indoor air quality, and how choices for electric or gas equipment may impact compliance with those standards.
- Within each building type, review key mandatory measures related to energy performance, ventilation, refrigerants and insulation and review potential challenges for integration into design and construction.
- Review the prescriptive "recipe card" approach versus a building performance approach and discuss when to use each strategy to best incorporate energy efficiency and healthy interior environments into the specific project design.
- Recognize where barriers or stumbling blocks may occur within permitting and construction and tips for documentation to smooth out the process, ultimately increasing the energy efficiency, health and safety of our buildings.

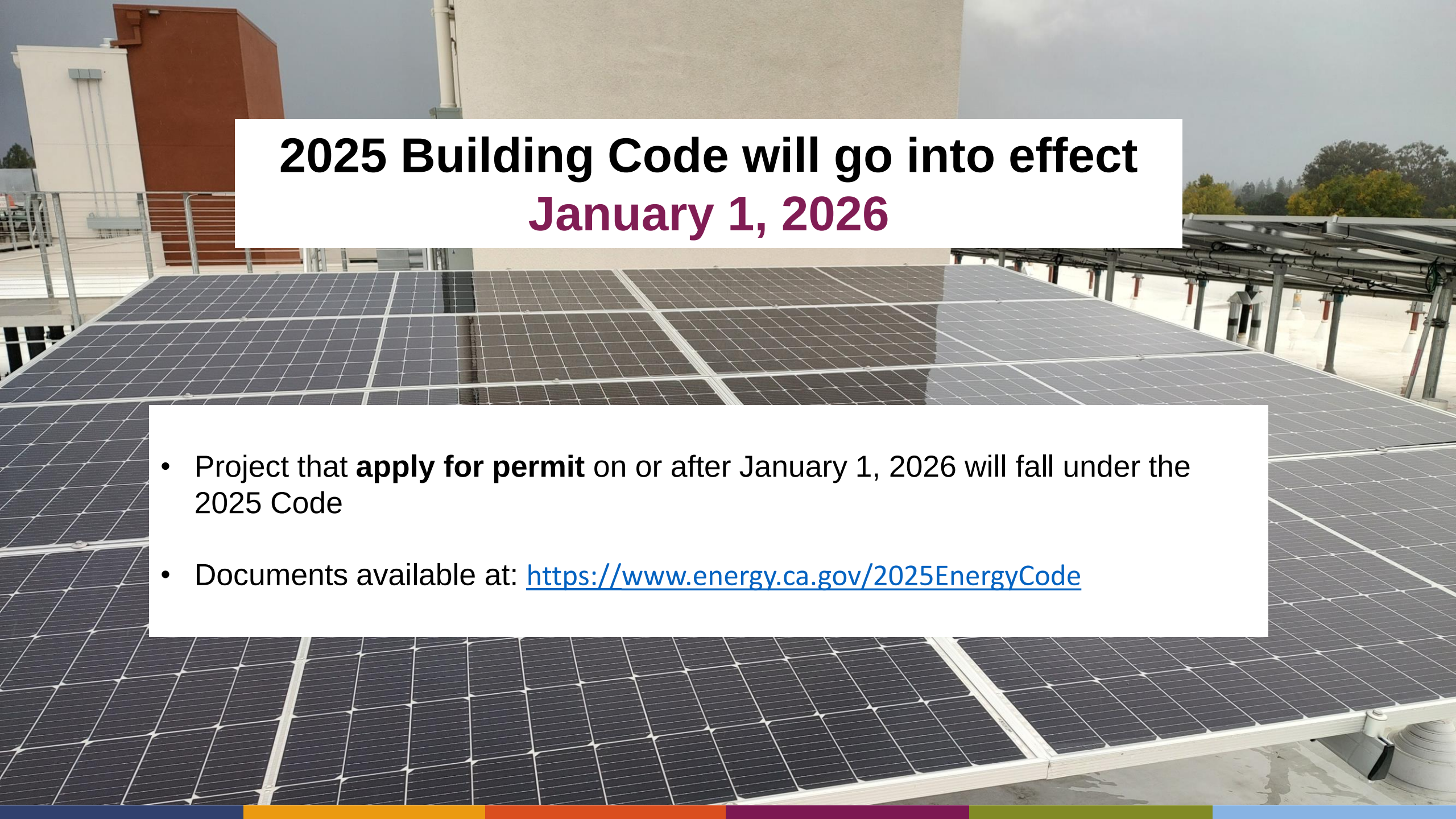
Learning Units:

1.5 AIA HSW LU approved for this course
0.15 ICC CEU approved for this course

Agenda

1. Energy Code –Overview and 2025 Updates
2. Mandatory Measures: All Occupancies – Service Water Heating
3. Mandatory Measures: Multifamily – Envelope, Ventilation, Heat Pumps, and Electric Ready
4. Prescriptive Measures: Envelope, Hot Water, Solar and Battery

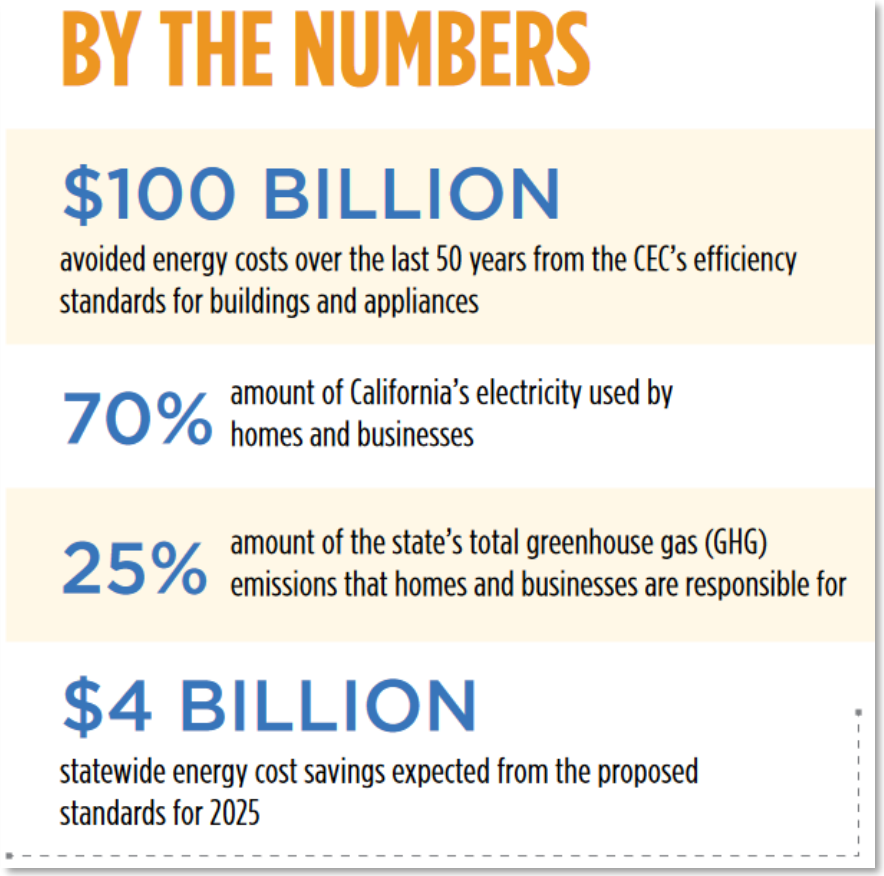
Energy Code Overview and 2025 Updates



2025 Building Code will go into effect
January 1, 2026

- Project that **apply for permit** on or after January 1, 2026 will fall under the 2025 Code
- Documents available at: https://www.energy.ca.gov/2025EnergyCode

Big Picture Goals for the 2025 Code Updates



2025 California Energy Code Fact Sheet
energy.ca.gov/2025EnergyCode

- Expand the use of heat pump technology for space and water heating
- Encourage electric-ready buildings to help owners for an easy transition to electric appliances and cooking
- Expand PV systems and battery storage standards to achieve cost effective installation
- Strengthen ventilation standards in Multifamily buildings

California Energy Commission (CEC)

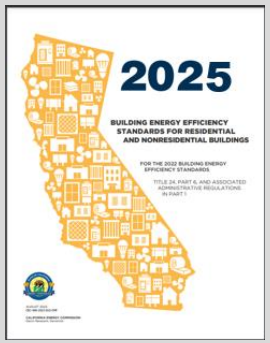
energy.ca.gov/2025EnergyCode

TITLE 24, Part 6

California's Building Energy Efficiency Standards (aka the Energy Code) is updated every three years by the CEC.

The process includes engagement with the public, industry experts, in-house expertise, and other stakeholders.

T24 Part 6 Energy Code – Subchapter Organization



All [*regulated*] Occupancies

(A, B, E, F, H, I, L, M, R, S, or U, except I-3 and I-4)

Subchapter 1 –All Occupancy –Scope, Definitions

Subchapter 2 –All Occupancies – Mandatory Requirements

Sec 100.0-100.3 & Sec 110.0-110.12

Non-Residential

Subchapter 3 – Nonresidential, Hotel/Motel, Covered Process –Mandatory Requirements [*HVAC and Ventilation*]

Sec 120.0-120.9

Subchapter 4 – Nonresidential, Hotel/Motel –Mandatory Requirements [*Lighting and Power*]

Sec 130.0-130.5

Subchapter 5 –Performance and Prescriptive [*New Construction*]

Sec 140.0-140.9

Subchapter 6 – Additions and Alterations

Sec 141.0-141.1

Single Family Res

Subchapter 7 –Single Family Residential Mandatory Measures

Sec 150.0

Subchapter 8 – Performance and Prescriptive [*New Construction*]

Sec 150.1

Subchapter 9 – Additions and Alterations

Sec 150.2

Single Family, Duplex and Townhomes

Multifamily Res

Subchapter 10 – Multifamily Residential Mandatory Measures

Sec 160.0-160.9

Subchapter 11 – Performance and Prescriptive [*New Construction*]

Sec 170.0-170.2

Subchapter 12 – Additions and Alterations

Sec 180.0-180.4

Dwelling Units and Common Use Areas

Title 24 Part 6, 2022 Standards and Manuals

Title 24 Part 6, 2025 Standards and Manuals

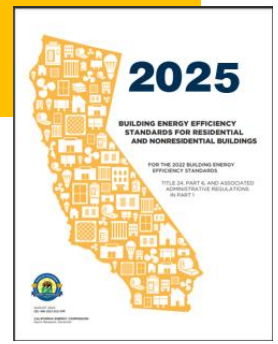
TABLE 100.0-A Application of Standards

TABLE 100.0-A APPLICATION OF STANDARDS (continued)

Occupancies	*Application*	*Mandatory*	*Prescriptive*	*Performance*	*Additions Alterations*
Multifamily	General	160.0	170.2	170.1	180.0
Multifamily	Envelope (conditioned)	110.6, 110.7, 110.8, 160.1	170.1(a)	170.1	180.0
Multifamily	Ventilation and Indoor Air Quality	160.2	N.A.	170.1	180.0
Multifamily	HVAC (conditioned)	110.2, 110.5, 160.3	170.2(c)	170.1	180.0
Multifamily	Water Heating	110.3, 160.4	170.2(d)	170.1	180.0
Multifamily	Indoor Lighting	110.9, 160.5	170.2(e)	170.1	180.0
Multifamily	Outdoor Lighting	110.9, 160.5	170.2(e)	170.1	180.0
Multifamily	Electrical Power Distribution	110.11, 160.6	N.A.	N.A.	180.0
Multifamily	Pool and Spa Systems	110.4, 110.5, 160.7	N.A.	N.A.	180.0
Multifamily	Solar Ready Buildings	110.10, 160.8	N.A.	N.A.	180.0
Multifamily	Electric Ready	160.9	N.A.	N.A.	N.A.
Multifamily	Solar PV and Battery Energy Storage Systems	N.A.	170.2(f), (g), (h)	170.1	N.A.

[1] Nonresidential and hotel/motel buildings that contain covered processes may conform to the applicable requirements of both occupancy types listed in this table.

Multifamily Excerpt



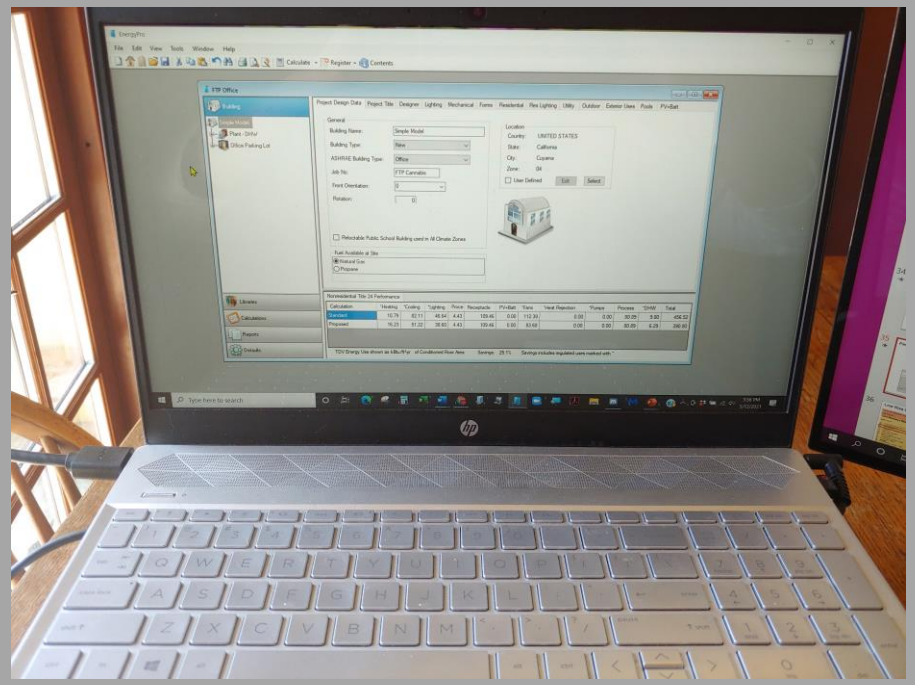
The Energy Code –Three Compliance Terms

Mandatory Requirements

Energy efficiency measures that are applicable to all projects.

Performance Method	**Prescriptive Component Package**
Mandatory Requirements are applicable	Mandatory Requirements are applicable
Other components or measures can be traded-off as long as the Proposed Design Building can be shown to be more energy efficiency than a similar sized Standard Design Building (baseline building)	Follow all the parts of the prescriptive package
	Note: used to determine the Standard Design Building
Energy modeling approach	Essentially a **checklist** approach

Performance Method Metric –*LSC* replaces *TDV*



TDV --Time Dependent Valuation represents the annual energy used in the building plus the additional amount of energy that went into delivering energy to the building. Based on a typical meteorologically year, expressed as “energy” (kbtu) use per square foot of building floor area.

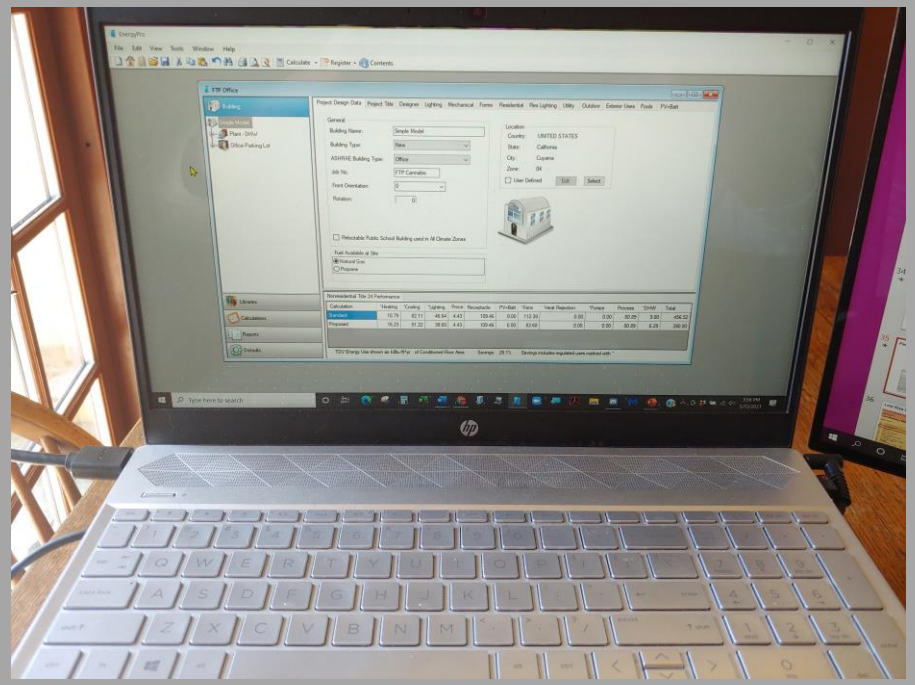
Source Energy represents the annual impact on carbon emissions for the creation and delivery of the energy used. This value is also expressed as kbtu per square foot of building floor area as a proxy for carbon.

Small Office Building Example in CBECC-Com

Overall Result[3]: **COMPLIES**

	Time Dependent Valuation: Efficiency[1] (kBtu/ft²-yr)	Time Dependent Valuation: Total[2] (kBtu/ft²-yr)	Source Energy use: Total[2] (kBtu/ft²-yr)
Standard Design	134.03	12.73	6.13
Proposed Design	131.10	1.06	5.66
Compliance Margins	**2.93**	**11.67**	**0.47**
	Pass	Pass	Pass

Performance Method Metric –*LSC* replaces *TDV*



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

Source Energy is defined as the long run marginal source energy of ***fossil fuels*** that are combusted as a result of the building energy consumed either directly at the building site or caused to be consumed to meet the electrical demand of the building…

Small Office Building Example in CBECC-Com

Overall Result[3]: **COMPLIES**

	LSC*e*	LSC*t*	Source Energy
Standard Design	134.03	12.73	6.13
Proposed Design	131.10	1.06	5.66
Compliance Margins	**2.93**	**11.67**	**0.47**
	Pass	Pass	Pass

HERS —Gets a New Name

HERS Rater:

- Duct Leakage Testing
- Blower Door / Envelope Leakage Testing
- Field Verifications:
  - Refrigerant Charge
  - Exhaust Fan and Kit Hood Fans
  - HVAC Efficiency and Capacity
- Assist/Complete: LMCI and LMCV, etc

Residential and Multifamily – *HERS* will be replaced by *ECC*

OLD

HERS

- Title 20 (Ch 4, Art 8, Sec 1670)
- 2022 and Prior Code Cycles
- HERS –Home Energy Rating System
- HERS Rater
  - HERS Field Verification and Diagnostic Testing

NEW

ECC Program

- Title 24, Art 1, Sec 10-103.3
- 2025 Code
- ECC –Energy Code Compliance
- ECC-Rater
  - Field Verification and Diagnostic Testing (FV&DT)

- Includes a **Quality Assurance Review** and audit process for the ECC-Rater.
- The ECC-Rater can achieve an ***Exemplary*** status.

Process for Low-Rise Multifamily Permitting

LMCC Compliance created and uploaded to HERS Registry

LMCI Installation completed and uploaded to HERS Registry

LMCV Verification completed and uploaded to HERS Registry

Building Official Confirms forms are uploaded and signed

HERS – Home Energy Rating System

CHEERS is the Provider organization for California Title 24 compliance. They are responsible for training and certifying HERS Raters, and supporting the California Energy Code HERS Registry.

Process for Low-Rise Multifamily Permitting

2025 Update HERS ⟶ ECC

LMCC Compliance created and uploaded to ECC Registry

LMCI Installation completed and uploaded to ECC Registry

LMCV Verification completed and uploaded to ECC Registry

Building Official Confirms forms are uploaded and signed

ECC – Energy Code Compliance

CHEERS is the Provider organization for California Title 24 compliance. They are responsible for training and certifying ECC Raters, and supporting the California Energy Code ECC Registry.

Excerpt from Compliance Report

CERTIFICATE OF COMPLIANCE - LOWRISE MULTIFAMILY MIXED USE PERFORMANCE COMPLIANCE METHOD

Lowrise Multifamily Mixed Use Performance Compliance Method **(Page 3 of 26)**

C1. COMPLIANCE SUMMARY

COMPLIES[3]

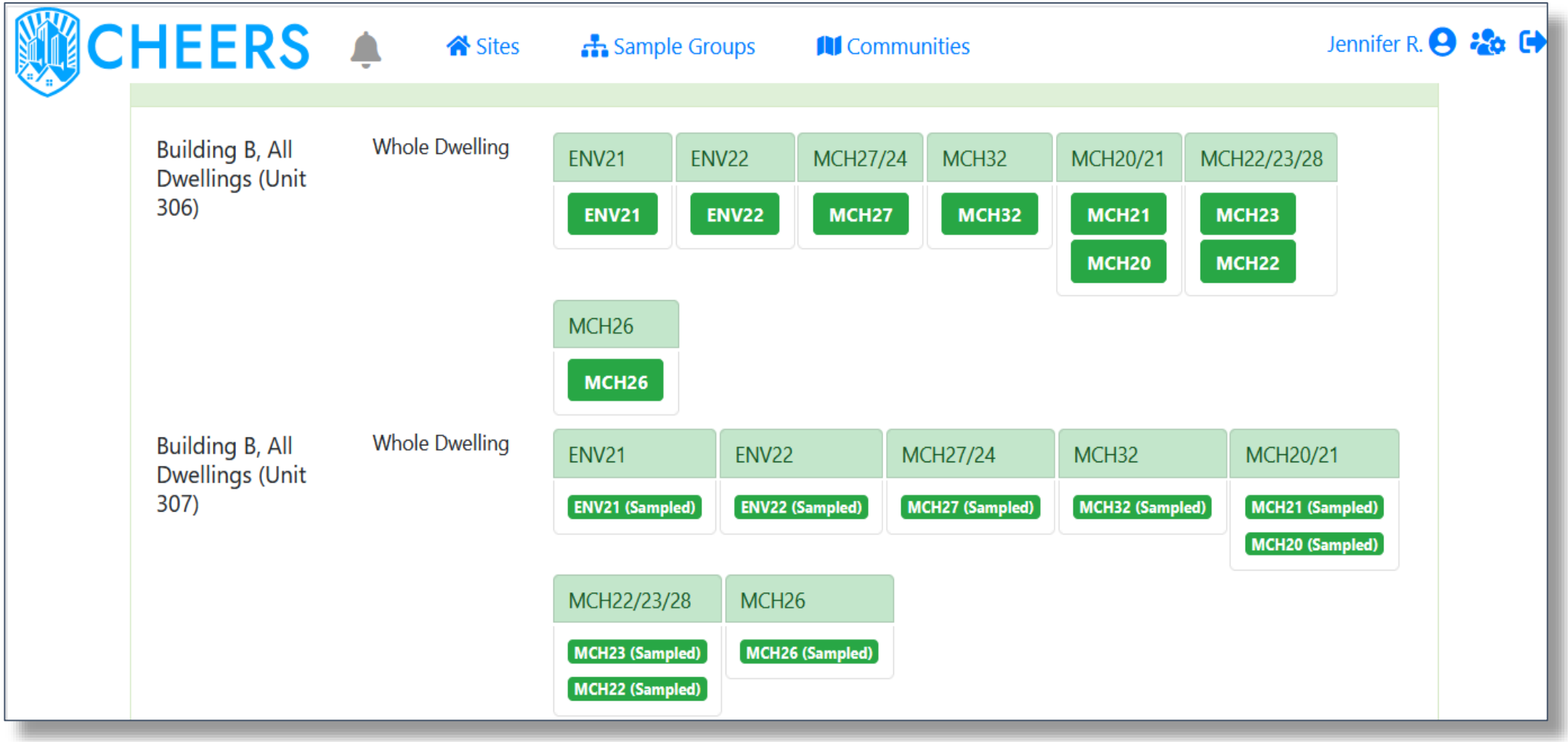
	Time Dependent Valuaton (TDV)		Source Energy Use
	Efficiency[1] (kBtu/ft² - yr)	**Total[2] (kBtu/ft² - yr)**	**Total[2] (kBtu/ft² - yr)**
Standard Design	76.36	29.66	11.58
Proposed Design	76.08	29.35	11.51
Compliance Margins	**0.28**	**0.31**	**0.07**
	Pass	**Pass**	**Pass**

[1] Efficiency measures include improvements like a better building envelope and more efficient equipment

[2] Compliance Totals include efficiency, photovoltaics and batteries

[3] Building complies when efficiency and total compliance margins are greater than or equal to zero and unmet load hour limits are not exceeded

Example Multifamily Project – CHEERS Registry



Mandatory Measures: All Occupancies

Service Water Heating

Heat Pump Water Heater Types Defined

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.

Integrated

A. O. Smith - Residential

AO Smith –Small Commercial

Aegis A -- Lync by Watts Large-Scale Commercial

Sanden – Multifamily – Grouped or Single Split System

Lochinvar Commercial Scale

Nyle –Industrial or Large Central Systems

Example of Split-Hydronic Heat Pump Water Heater System

Project: Harry's House – Santa Barbara County

New Mandatory Measures –All Occupancies

110.2 Space-Conditioning Equipment

- Some Appliance Tables Removed;
- Tables updated to meet the Federal Minimum Efficiencies;
- New Table for Heat Pump and Heat Recovery Chillers
- Updated Cooling Tower Water Quality/Properties

110.3 Service Water Heating

- Installation of Heat Pump Water Heater

110.4 Pool and Spa Systems and Equipment Installation

- Sizing
- Efficiency
- Supplementary heater and cut-on/cut-off controls

Key Take-Away:

As part of the water-energy nexus, many of these changes improve water and energy efficiency.

New Mandatory Requirements for HPWH Installations

Section 110.3 Service Hot Water

110.3 (c) Installation:

1. Outlet temperature controls
2. Control for hot water distribution systems
3. Insulation
4. Water heating recirculation loops serving multiple dwelling units
5. Service water heaters in state buildings
6. Isolation valves
7. Air-Source Heat Pump Water Heaters (HPWHs)

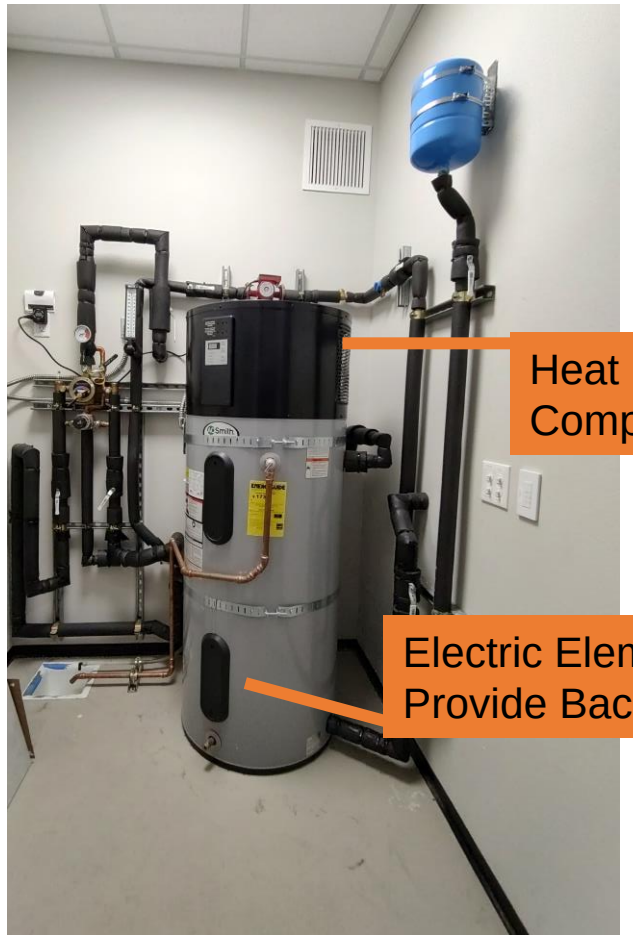
New Mandatory Requirements for HPWH

7. Air-Source Heat Pump Water Heaters (HPWHs). HPWH shall meet the following requirements:

A. Backup Heat. Backup heat is required for systems when inlet air is unconditioned, unless the compressor cut-off temperature is below the Heating Winter Median of Extremes for the closest location listed in Table 2-3 from Reference Joint Appendix JA2. Backup heat may be internal or external to the HPWH.

B. Ventilation. Consumer integrated HPWHs shall meet one of the ventilation requirements below. Minimum volume and opening size requirements shall be the sum of all HPWHs installed within the same space. Compressor capacity shall be determined using AHRI 540 Table 4 reference conditions for refrigeration with the “High” rating test point:

1. Installed using a method provided by the manufacturer to meet or exceed the level of performance provided by the ventilation requirements of Section 110.3(c)7B2 through Section 110.3(c)B4.



New Mandatory Requirements for HPWH *no Ducts*

2. For HPWH installation without ducts, the installation space shall have a volume not less than the greater of 100 cubic feet per kBtu per hour of compressor capacity, or the minimum volume provided by the manufacturer for this method; or

3. For HPWH installation without ducts, the installation space shall be vented to a communicating space via permanent openings, according to the following requirements:

i. Communicating space shall meet the minimum volume of section 110.3(c)7B2 above, minus the volume of the HPWH installation space; and

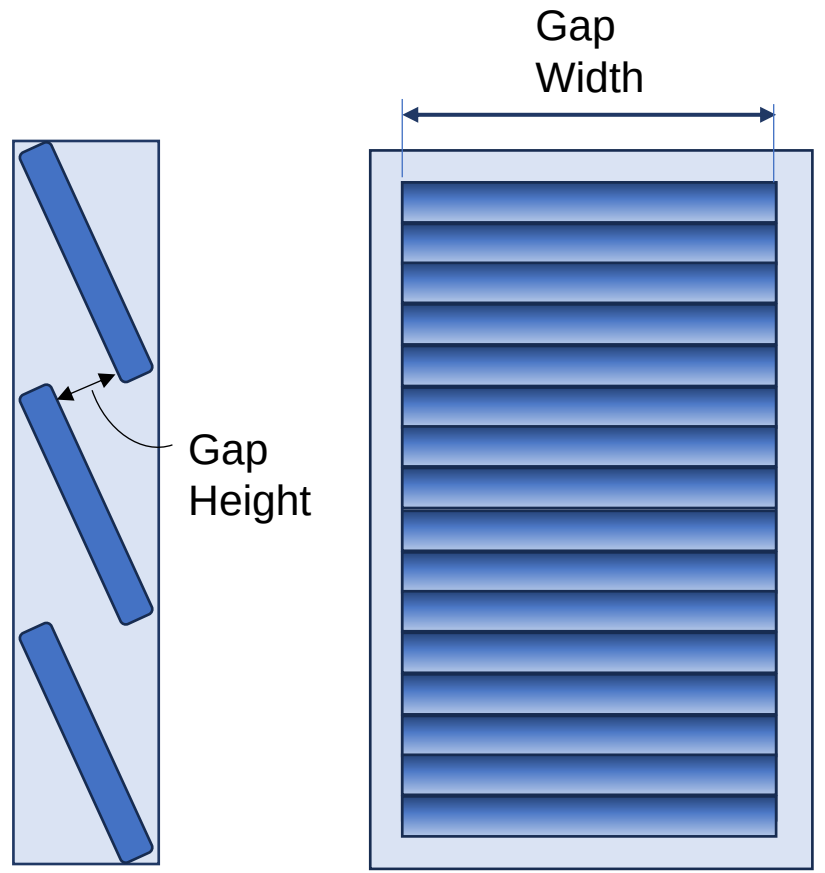
ii. Permanent openings shall consist of a single layer of fixed flat slat louvers or grilles, with a total minimum **Net Free Area (NFA)** the larger of 125 square inches plus 25 square inches per kBtu per hour of compressor capacity, or the minimum provided by the manufacturer for this method. The permanent openings shall be fully louvered doors or two openings of equal area, one in the upper half of the enclosure and one in the bottom half of the enclosure. The top of the upper opening must be 12 inches or less from the enclosure top and the bottom of the lower vent must be 12 inches or less from the enclosure bottom; or

Note:
4200 Btu/h or 4.2 kBtu/h compressor capacity is common for many residential units, i.e. 40-80 gal.

NFA = 125 sq in + 25 sq in per kBtu/h of compressor capacity or manufacturer specifications, whichever is larger.

Sidebar: New Definition –Net Free Area (NFA)

- 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.



New Mandatory Requirements for HPWH *with Ducts*

4. **For HPWH installations with ducts**, the following requirements shall be met:

   i. The space joined to the installation space via ducts shall meet the minimum volume of section 110.3(c)7B2 above, minus the volume of the HPWH installation space; and

   ii. All duct connections and building penetrations shall be sealed; and

   iii. Exhaust air ducts and all ducts which cross pressure boundaries shall be insulated to minimum of R-6; and

   iv. Where only the HPWH inlet or outlet is ducted, installation space shall include permanent openings which consist of a single layer of fixed flat slat louvers or grilles in the bottom half of the room, and/or a door undercut. With a ducted inlet, the minimum NFA shall be equal to the cross-sectional area of the duct. With a ducted exhaust, the minimum NFA shall be the larger of 20 square inches or the minimum NFA provided by the manufacturer for this method; and

   v. Where the inlet and outlet ducts both terminate within the same pressure boundary, airflow from the termination points shall be diverted away from each other;

Note: Ducting only the inlet or the exhaust across the pressure boundary could interfere with balanced ventilation systems. This should be considered when specifying HPWH location and ventilation method.

Mandatory Measures: Multifamily

Envelope, Ventilation, Heat Pumps, and Electric Ready

Multifamily Section 160.0

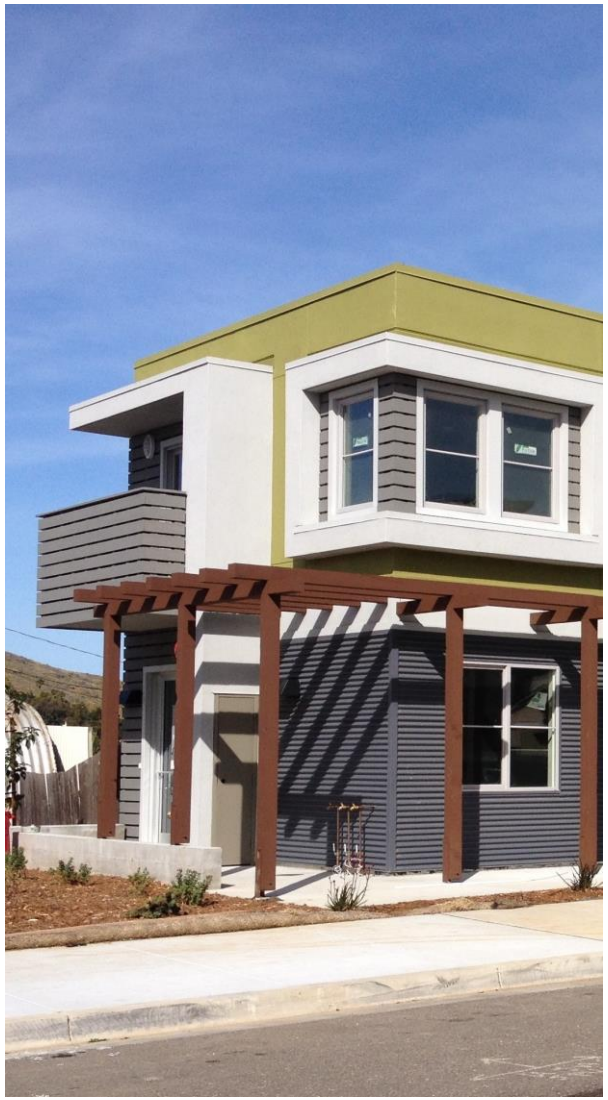
- Applies to new construction (but, is referenced for Additions and Alterations in Sec 180.0)
- Applies to dwellings units and common use areas in multifamily buildings.

Note:

- Nonresidential occupancies shall comply with Sections 120.0 through 141.1.

Section 160.0 Mandatory Requirements:

160.0 General Scope
160.1 Building Envelope
160.2 Ventilation and Indoor Air Quality
160.3 Space Conditioning Systems
160.4 Water Heating Systems
160.5 Lighting –Indoor and Outdoor
160.6 Electric Power Distribution Systems
160.7 Covered Process
160.8 Solar Ready Buildings
160.9 Electric Ready Buildings



New Window Exception for WUI

- U-0.58 continues to be the max U-factor allowable:
  - Exception: 0.5 % of the conditioned floor area
  - Exception: 30 sq ft per dwelling of dual-glazed greenhouse or garden windows
- Aligns with the new **Part 7** of Title 24

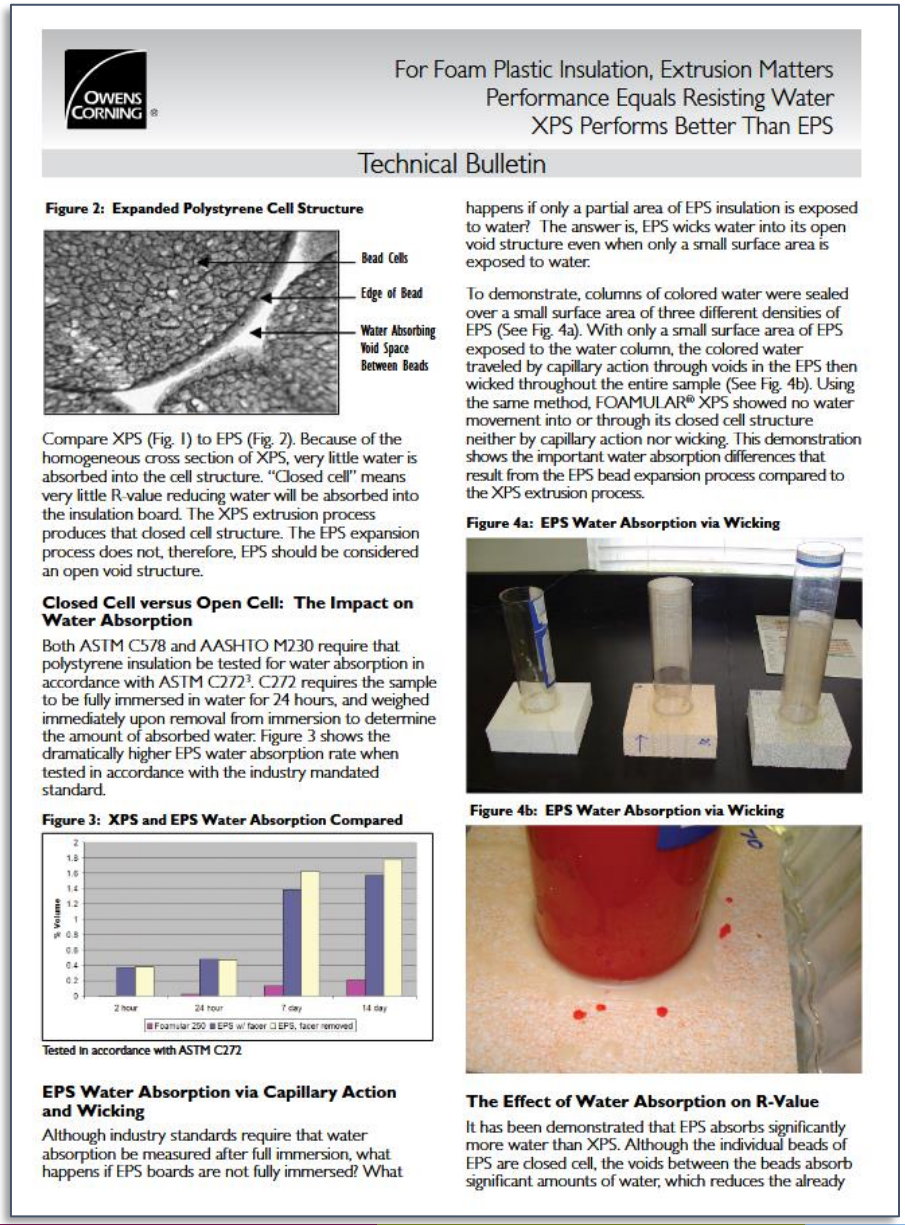
New Exception to Section 160.1(e):

Fenestration installed in buildings meeting Part 7 of the California Building Code, California Wildland-Urban Interface Code, where the building is located in *Fire Hazard Severity Zones or Wildland-Urban Interface* ***(WUI)*** *Fire Areas* as designated by the local enforcement agency.

New 2025 Item Under 160.1

(g) Slab edge Insulation. Slab edge insulation shall meet the following minimum specifications:

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



OWENS CORNING

For Foam Plastic Insulation, Extrusion Matters
Performance Equals Resisting Water
XPS Performs Better Than EPS

Technical Bulletin

Figure 2: Expanded Polystyrene Cell Structure

Bead Cells
Edge of Bead
Water Absorbing Void Space Between Beads

Compare XPS (Fig. 1) to EPS (Fig. 2). Because of the homogeneous cross section of XPS, very little water is absorbed into the cell structure. "Closed cell" means very little R-value reducing water will be absorbed into the insulation board. The XPS extrusion process produces that closed cell structure. The EPS expansion process does not, therefore, EPS should be considered an open void structure.

Closed Cell versus Open Cell: The Impact on Water Absorption

Both ASTM C578 and AASHTO M230 require that polystyrene insulation be tested for water absorption in accordance with ASTM C272[3]. C272 requires the sample to be fully immersed in water for 24 hours, and weighed immediately upon removal from immersion to determine the amount of absorbed water. Figure 3 shows the dramatically higher EPS water absorption rate when tested in accordance with the industry mandated standard.

Figure 3: XPS and EPS Water Absorption Compared

Tested in accordance with ASTM C272

EPS Water Absorption via Capillary Action and Wicking

Although industry standards require that water absorption be measured after full immersion, what happens if EPS boards are not fully immersed? What happens if only a partial area of EPS insulation is exposed to water? The answer is, EPS wicks water into its open void structure even when only a small surface area is exposed to water.

To demonstrate, columns of colored water were sealed over a small surface area of three different densities of EPS (See Fig. 4a). With only a small surface area of EPS exposed to the water column, the colored water traveled by capillary action through voids in the EPS then wicked throughout the entire sample (See Fig. 4b). Using the same method, FOAMULAR® XPS showed no water movement into or through its closed cell structure neither by capillary action nor wicking. This demonstration shows the important water absorption differences that result from the EPS bead expansion process compared to the XPS extrusion process.

Figure 4a: EPS Water Absorption via Wicking

Figure 4b: EPS Water Absorption via Wicking

The Effect of Water Absorption on R-Value

It has been demonstrated that EPS absorbs significantly more water than XPS. Although the individual beads of EPS are closed cell, the voids between the beads absorb significant amounts of water, which reduces the already

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Ventilation and Indoor Air Quality (IAQ)

Part (a) General Requirements

- Attached **dwellings** units –See part (b) –follows **Residential** Code
- HERS field verification and diagnostic testing for **three habitable stories or less** –See **Residential** Appendices

- Occupiable spaces **other than** attached dwelling units –See part (c) – follows **Non-Res** Code
- HERS for buildings with **four or more habitable stories** –See **Non-residential** Appendices NA1 and NA2.

- **Reminder**: Section 160.2 is **not applicable** to townhouses or dwellings that contain two dwelling units.
- **Reminder**: The outdoor air-ventilation rate and the air-distribution system design shall be **clearly identified on the building design plans**

Big Picture Change: The Multifamily Section addresses **both** the Residential and Non-Residential occupancies

Requirements for Ventilation and Indoor Air Quality (IAQ)

- Part (b) –ASHRAE 62.2 continues to be the basis for dwelling unit (residential) occupancies
- Part (c) –ASHRAE 62.1 continues to be the basis for common space (non-residential) occupancies

- Includes outside air (OA) ventilation and mechanical exhaust for bathrooms and kitchens

HERS/ECC Rater testing proper air flow with a flow hood.

Requirements for Ventilation Indoor Air Quality (IAQ)

This equation is for calculating the
'*Total required ventilation rate*' for the dwelling:

$$Q_{total} = 0.03A_{floor} + 7.5(N_{br} + 1)$$

Where:
Q_{total} = Total required ventilation rate (CFM)
A_{floor} = Conditioned floor area in square feet (ft^2)
N_{br} = Number of bedrooms (not fewer than one)

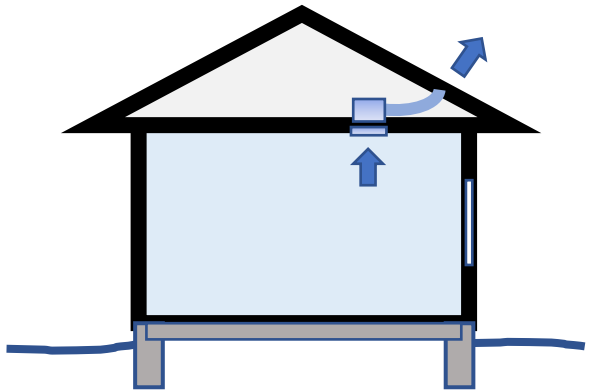
Required IAQ is based on the total required ventilation rate for the dwelling minus the calculated annually averaged infiltration rate.

This equation can be a good *estimate* for the required IAQ Ventilation.

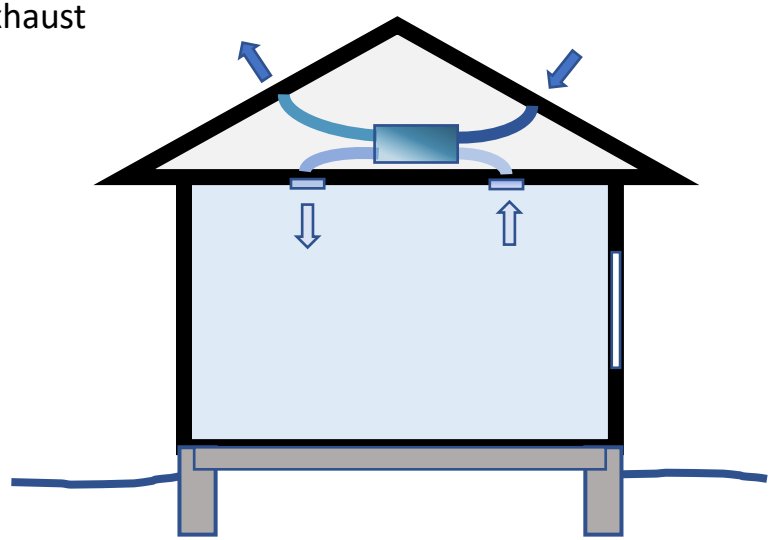
Mechanical Exhaust –Kitchens and Bathrooms

Local Mechanical Exhaust shall be installed in each kitchen and bathroom. Systems shall be rated for airflow in accordance with ASHRAE 62.2 section 7.1.

- **Open (Non-enclosed) Kitchens:** demand controls and meet min ventilation
- **Enclosed Kitchens and Bathrooms:** can use continuous ventilation systems that are part of ERV/HRV systems



Local Exhaust



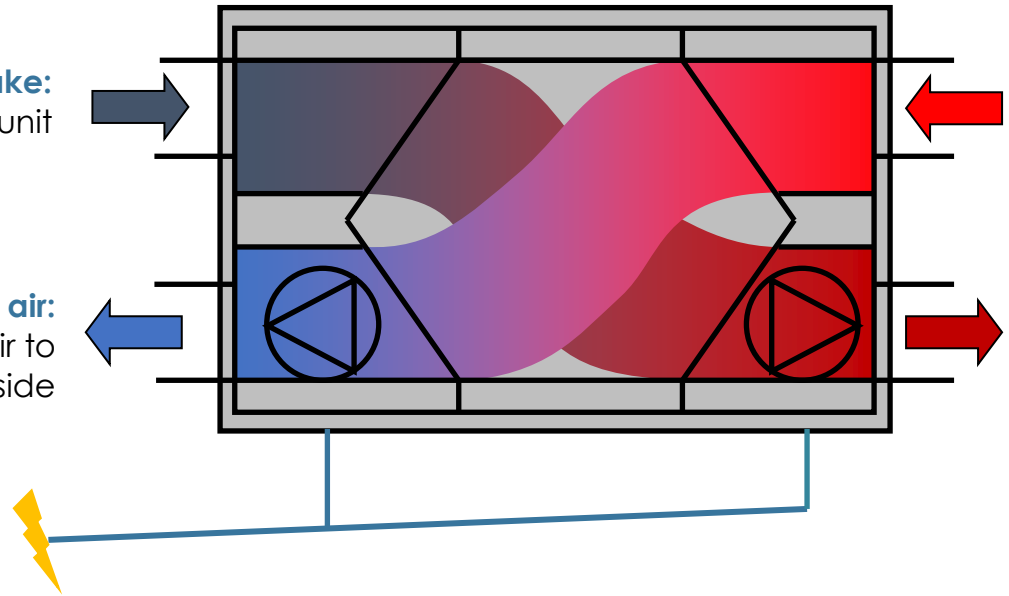
ERV/HRV Balanced Ventilation with **fan efficacy of ≤1.0 W/cfm**

All systems must have occupant **accessible ON-OFF** switches –and if part of IAQ ventilation system be label , "This switch controls the indoor air quality ventilation for the home. Leave it switch in the "on" position at all times unless the **outdoor air quality is very poor**."

Illustration of Energy / Heat Recovery Ventilation (ERV / HRV)

Outdoor air intake:
fresh air into unit

Exhaust / Extract air:
post-recovery air to outside



Exhaust / Extract air:
From inside conditioned space

Supply air (Outdoor air):
outside air into living rooms, offices, classrooms

HRV –Heat Recovery Ventilator
ERV –Energy Recovery Ventilator

- Thin membrane, multi-channel pathway for the Outdoor/Supply air going in and the Exhaust/Extracted air going out
- The air pathways do not mix

Multifamily IAQ:
Balance Ventilation per Each Dwelling Unit vs Dwelling Unit Compartmentalization

Balanced Ventilation
ERV Provides Outside Air (OA)

VS

Blower Door Compartmentalization Testing

Exhaust Only Fan System: Depends on leaky outside walls for OA and sealed interior shared walls to eliminate transferred air between dwelling units.

Indoor Air Quality and Mechanical Ventilation for Low-rise Multifamily LMCI-MCH-27-H

INDOOR AIR QUALITY AND MECHANICAL VENTILATION

CALIFORNIA ENERGY COMMISSION CEC-LMCI-MCH-27-H

SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

CERTIFICATE OF INSTALLATION

Note: This table completed by HERS Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

Title 24, Part 6, Section 160.2(b)2 **Ventilation and Indoor Air Quality for Attached Dwelling Units.** All dwelling units shall meet the requirements of ANSI/ASHRAE Standard 62.2-2019 Ventilation and Acceptable Indoor Air Quality in Residential Buildings subject to the amendments specified by Title 24, Part 6, Section 160.2(b)2A

A. Whole-Dwelling Mechanical Ventilation - General Information

Note:

Non-dwelling units do not meet the definition for a dwelling unit as defined in Section 100.1(b). Non-dwelling units are not designed to provide independent living facilities and do not provide permanent provisions for living…

03	**7.3 Exhaust Ducts.** 7.3.1 **Multiple Exhaust Fans Using One Duct.** Exhaust fans in separate dwelling units shall not share a common exhaust duct. If more than one of the exhaust fans in a single dwelling unit shares a common exhaust duct, each fan shall be equipped with a backdraft damper to prevent the recirculation of exhaust air from one room to another through the exhaust ducting system. 7.3.2 **Single Exhaust Fan Ducted to Multiple Inlets.** Where exhaust inlets are commonly ducted across multiple dwelling units, one or more exhaust fans located downstream of the exhaust inlets shall be designed and intended to run continuously, or a system of one or more backdraft dampers shall be installed to isolate each dwelling unit from the common duct when the fan is not running.
04	**7.4 Supply Ducts.** Where supply outlets are commonly ducted across multiple dwelling units, one or more supply fans located upstream of all the supply outlets shall be designed and intended to run continuously, or a system of one or more backdraft dampers shall be installed to isolate each dwelling unit from the common duct when the fan is not running.

Multifamily Project

Hardworking HERS Rater

Forms are similar to Single Family. Some big differences include backdraft dampers and air sealing to stop air movement between dwellings.

IAQ – Indoor Air Quality Ventilation – HRV or ERV
LMCI-MCH-27-H

INDOOR AIR QUALITY AND MECHANICAL VENTILATION

CALIFORNIA ENERGY COMMISSION CEC-LMCI-MCH-27-H

SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

CERTIFICATE OF INSTALLATION

Note: This table completed by HERS Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

Title 24, Part 6, Section 160.2(b)2 **Ventilation and Indoor Air Quality for Attached Dwelling Units.** All dwelling units shall meet the requirements of ANSI/ASHRAE Standard 62.2-2019 Ventilation and Acceptable Indoor Air Quality in Residential Buildings subject to the amendments specified by Title 24, Part 6, Section 160.2(b)2A

A. Whole-Dwelling Mechanical Ventilation - General Information

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INDOOR AIR QUALITY AND MECHANICAL VENTILATION

CALIFORNIA ENERGY COMMISSION CEC-LMCI-MCH-27-H

SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

C2. HRV or ERV serving Individual Dwelling Unit

- Heat or Energy Recovery Systems must have a fan efficacy of ≤ 1.0 W/cfm in all climate zones (Section 160.2(b)2Biii).

Heat or Energy Recovery Systems must prescriptively have a fan efficacy of ≤ 0.6 W/cfm and a minimum sensible heat recovery of 67% in climate zones 1, 2, and 11-16 (Section 170.2(c)3Biva).

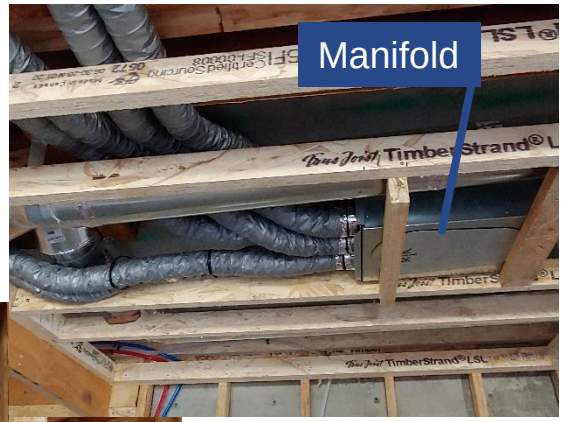
01	02	03	04
Manufacturer Make	Manufacturer Model Number	Fan Efficacy Performance Rating (W/CFM)	Sensible Recovery Efficiency (%)

D. Additional Envelope Requirements

01	Envelope Leakage	

MC

Duct System 'Home Runs' to the Heat Exchanger and Fan Unit



Heat Exchanger and Fan Unit

ERV / HRV Balanced Ventilation Example
ERV = Energy Recovery Ventilation
HRV = Heat Recovery Ventilation

High-Rise Dwelling Units –HERS or ATT Acceptance Testing
IAQ Ventilation NRCA-MCH-20c-H

Similar to Commercial Projects – '**Functional Testing**' of Systems is Required

CALIFORNIA ENERGY COMMISSION **IAQ VENTILATION** 2022-CEC-NRCA-MCH-20c-H

Project Name and Address	**Authority Having Jurisdiction**
Name: Project Name	Enforcement Agency: Agency
Address: Project Address	Permit Number: Permit Number
City, Zip: City, Zip Code	Permit Application Date: Date

Value	Room: Enter Value	Control/tag: Value

tional testing comply	Date Submitted to AHJ: Date

See 'Intent' and Code References for more information

Intent:	• This acceptance test is intended for multifamily dwelling units where CONTINUOUS ventilation is used. This acceptance test is not permitted for Central Fan Integration (CFI) systems or other intermittent ventilation systems. • Submit one Certificate of Acceptance for each ventilation system installed to verify conformance with the requirements of the Energy Standards §160.2(b)2, Nonresidential Reference Appendices NA7.18.1.1 and NA2.2, and California Energy Commission adopted version of ANSI/ASHRAE Standards 62.2-2019. • NRCA-MCH-20a-H must be completed prior to beginning NRCA-MCH-20c-H. • If using Supply-only or Exhaust-only ventilation, Certificate of Acceptance NRCA-MCH-21-H must be completed prior to beginning NRCA-MCH-20c-H. NOTE: HERS verification or ATT acceptance testing required

Table B-1: Functional Testing – IAQ Ventilation System

Step	Entry	Functional Test	Code Reference
1	☐ Pass ☐ Fail ☐ N/A	If multiple fans are specified to operate simultaneously to provide the total required ventilation airflow, the measurements within this functional test must be made with all applicable fans operating simultaneously. Verify that all fans are operational. (Pass, Fail, N/A)	NA2.2.4.1
2	☐ Pass ☐ Fail	Activate the ventilation system using the system control and record all values in Table B-2	NA2.2.4.1 NA2.2.4.1.1(b)

CALIFORNIA ENERGY COMMISSION **IAQ VENTILATION** 2022-CEC-NRCA-MCH-20c-H

Table B-3: Functional Testing – Required Calculations

Step	Entry	Functional Test	Code Reference
1	Enter Value	Record the design ventilation air flow rate for the dwelling unit. (CFM)	NRCC-MCH-E Table J
2	Percent or N/A	**BALANCED SYSTEM Only**: Calculate the percent difference between the exhaust and supply airflow rates. Calculate 100x(B-2,6.1–B-2,6.2)÷B-2,6.1 (Enter value in units of percent or N/A)	NA2.2.4.1.1.2(e)

Table B-4: Functional Testing – Conditions for Passing
Conditions for passing ventilation systems that serve one dwelling unit

Step	Entry	Functional Test	Code Reference
1	☐ Pass ☐ Fail ☐ N/A	**Supply Only or Exhaust Only** Ventilation System passes if ALL of the following are true: • B-2,6.2 >= B-3,1, AND • NRCA-MCH-21-H is completed and complies. (Pass, Fail, N/A)	NA2.2.4.1.1(c) §160.2(b)2Aivb2
2	☐ Pass ☐ Fail ☐ N/A	**Balanced Only Ventilation** System passes if ALL of the following are true: • B-3,2 < 20%, AND • Exhaust(B-2,7.1) >= B-3,1, AND • Supply(B-2,7.2) >= B-3,1 (Pass, Fail, N/A)	NA2.2.4.1.1(g) §160.2(b)2Aivb1

See Code References for more information

Table B-5: Functional Testing – Conditions for Passing
Conditions for passing ventilation systems that serve multiple dwelling-units

Step	Entry	Functional Test	Code Reference
		Supply Only or Exhaust Only Ventilation	

2025 Update: Mechanical IAQ Ventilation

Outside air (OA) ventilation and testing:

- Balanced Ventilation, or
- Supply Only Ventilation,

and

- Compartmentalization Testing – ECC-Rater

Note:
For ***new construction***, exhaust only IAQ ventilation is **no longer an option**.

For **additions**, balanced, supply or **exhaust only** IAQ ventilation remains **allowable**.

Compartmentalization Testing, i.e. Blower Door Testing

2025 Update: Balance Ventilation

xi. **Balanced and supply ventilation component accessibility**. Balanced and supply ventilation systems shall meet the following requirements for accessibility:

a. **IAQ filter and HRV/ERV accessibility**. System air filters and HRV/ERV heat/energy recovery cores shall be located such that they are accessible for service from within occupiable spaces, basements, garages, balconies, mechanical closets or accessible rooftops. Filters and heat/energy recovery cores behind access panels, access doors, or grilles located no more than 10 feet above a walking surface inside a space specified above comply with this requirement.

Exception to Section 160.2(b)2Axia: Systems that require servicing from inside the attic shall have the following:

1. **Fault Indicator Display** (FID) meeting the requirements of Reference Appendix JA 17; and

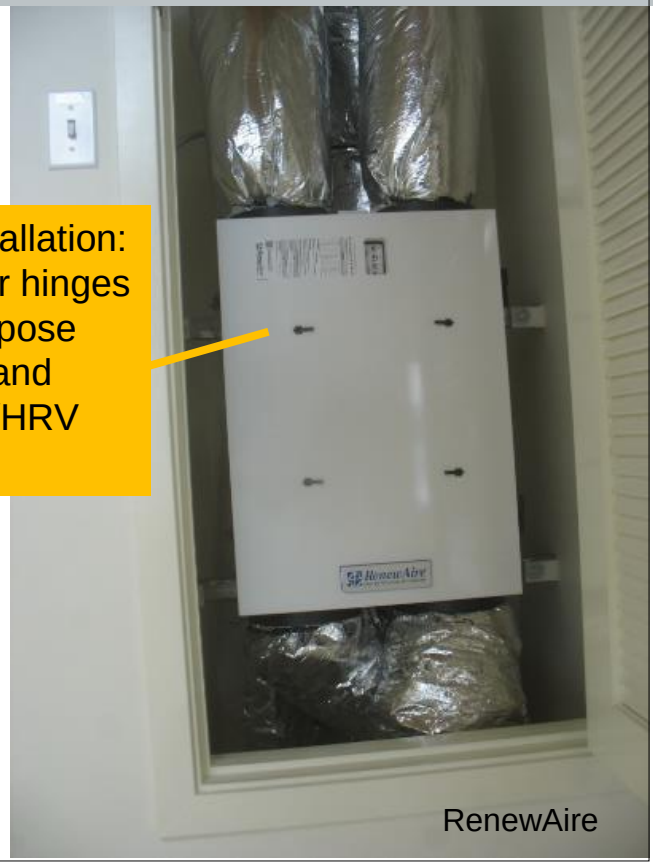
2. **An attic access door** located in a wall or, where attic access is provided through a ceiling, an attic access hatch that includes an integrated ladder; and

3. **A walkway** from the attic access door to the HRV/ERV.

b. **IAQ system component accessibility**. Fans, motors, heat exchangers, filters and recovery cores shall meet all applicable requirements of California Mechanical Code 304.0 accessibility of service.

Balanced Ventilation –Component Access

Accessible for Maintenance



Closet Installation: Front cover hinges open to expose Air Filters and Core ERV/HRV Filter

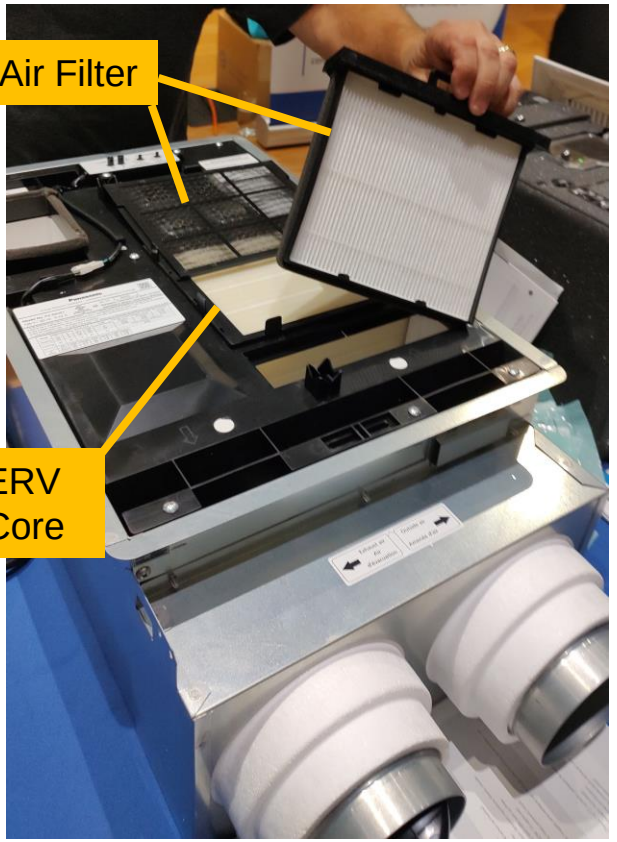
RenewAire

Fault Diagnostics

Fault Diagnostics

Fault Indicator Display (FID)

Broan AI Series



Panasonic ERV

Common Use Areas – Vz Outdoor Air (OA)

Updated Ventilation Zone (Vz) Formula:

Vz (cfm) = *larger of* **Rp x Pz** or **Ra x Az**

Where:

Rp = 15 cfm of OA per person

Pz = Expected number of people*

Ra = Area-based Min Ventilation (Table.160.2-B)

Az = Net occupiable floor area

*__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 120.1-A 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 Section 1004.6.

TABLE 160.2-B – Minimum Occupant Load Density and Ventilation Rates for Multifamily Common Use Areas

Space Type	Minimum Occupant Load Density (p/1000 ft²)[1]	Area-based Minimum Ventilation Ra (cfm/ft²)	Air Class	Notes
Coffee stations	33	0.15	1	F
Conference/meeting	33	0.15	1	F
Corridors	5	0.15	1	F

Note: The minimum occupant density is one half of the maximum occupant load assumed for egress purposes in the CBC.

Example:
2000 sf of Res Common Corridor

Vz = **Rp x Pz**
= 15 cfm (5/1000 sf) (2000 sf)
= 150 cfm

or

Vz = **Ra x Az**
= 0.15 cfm/sf (2000 sf)
= 300 cfm

Individual Dwelling Unit Space Conditioning – Heat Pumps

Heat Pump Defrost

A. If a heat pump is equipped with a defrost delay timer, the delay timer must be set to greater than or equal to 90 minutes.

B. The installer shall certify the Certificate of Installation

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

Heat Pump capacity variation with third-party thermostats.

Variable or multi-speed systems shall comply with the following requirements:

A. The space conditioning system and thermostat together shall be capable of responding to heating and cooling loads by modulating system compressor speed.

B. The installer shall certify the Certificate of Installation

Domestic Hot Water Pipe Insulation

(e) Pipe Insulation

All piping for multifamily domestic hot water systems shall be insulated and meet the applicable requirements 1 through 3 below:

1. General Requirements.

A. The first 8 feet of inlet cold water piping from the storage tanks, including piping between a storage tank and a heat trap shall be insulated.

B. Insulation on the piping and domestic hot water system appurtenances shall be continuous.

C. Pipe supports, hangers, and pipe clamps shall be attached on the outside of rigid pipe insulation to prevent thermal bridges.

D. All pipe insulation seams shall be sealed.

E. Insulation for pipe elbows shall be mitered, preformed, or site fabricated with PVC covers.

F. Insulation for tees shall be notched, preformed, or site fabricated with PVC covers.

G. Extended stem isolation valves shall be installed.

H. All plumbing appurtenances on hot water piping from a heating source to heating plant…

etc.

Pipes Insulated… But there is room for improvement

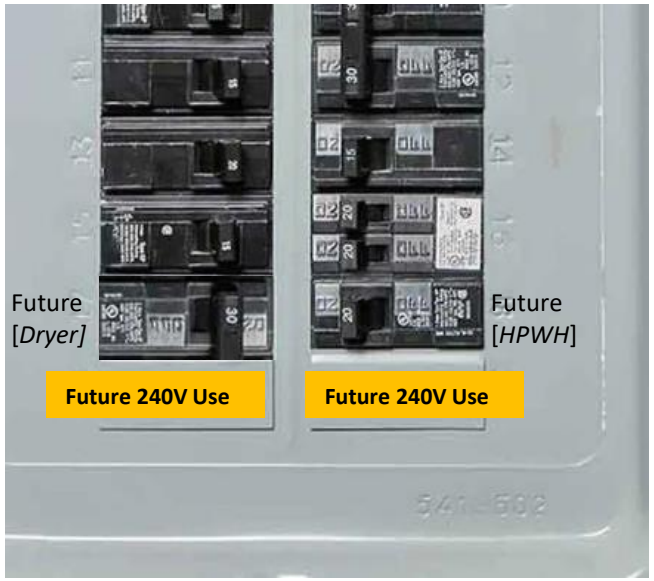
Pipe Clamp should be installed over the pipe insulation to prevent thermal bridging

Joints should be sealed, taped, or covered

Electric Ready …when installing gas appliances

- Water heaters: serving individual dwellings must install 125v/20amp outlet with spare conductor to allow for a 240v circuit - **160.4(a)**
- Furnaces: serving individual dwellings provide conductors rated at 240 volt/ 30 amp to the furnace for future heat pump installation- **160.9(a)**
- Cooktops: provide conductors rated at 240 volt/ 50 amp for future cooktop- **160.9(b)**
- Dryers –dwelling units: provide conductors rated at 240 volt/ 30 amp feed dryer - **160.9(c)1**
- Dryers –common space: provide conductors rated at 240 volt/ 24 amp feed per dryer or 2.6 kVA for each 10 kBtu/h gas dryer capacity- **160.9(c)2**

Electric ready items require breaker space and labeling in panel
AND
Electrical feed within 3 ft of non-electric appliance location



Example situation for a dwelling subpanel

Electric Clothes Dryer Ready –Common Space Laundry

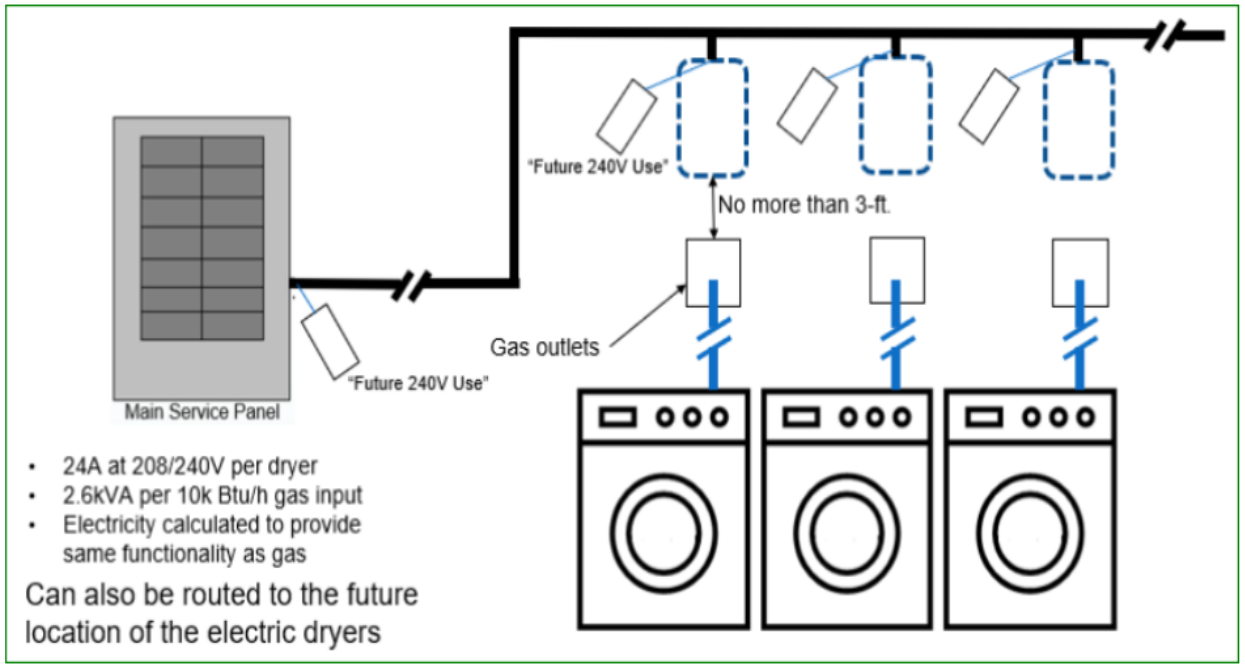


Figure 1: Example of electric ready system configuration for clothes dryers in common use area.

CALIFORNIA ENERGY COMMISSION

https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/online-resource-center/2022-3?utm_medium=email&utm_source=govdelivery

Electric Ready:

- Termination points for the conductors or raceways installed at the main panel, to a location 3 feet or less from each gas outlet
- Electrical conductors, raceway, panels, switchboards, and busbars must be sized to meet the future electric power requirements at the service voltage to the point at which the conductors serving the building connect to the utility distribution system
- The capacity requirements may be adjusted for demand factors in accordance with the California Electric Code and must meet one of the following:
    - 24 amps at 208V/240V per clothes dryer;
    - 2.6 kVA for each 10,000 Btu/hr of rated gas input or gas pipe capacity; or
    - The electrical power required to provide equivalent functionality of the gas-powered equipment, as calculated and documented by a project participant

Note: Gas flow rates must be determined in accordance with the California Plumbing Code

Electric Ready – 2025 Updates:

Section 160.9 Electric Ready Buildings:

(a) General Requirements

(b) Heat Pump Space Heating Ready

(c) Electric Cook Top Ready

(d) Electric Clothes Dryer Ready

(e) Individual Heat Pump Water Heater Ready

(f) Central Heat Pump Water Heater Ready

Note:

New Appendix JA15 –Qualification Requirements for Central Heat Pump Water Heater Ready

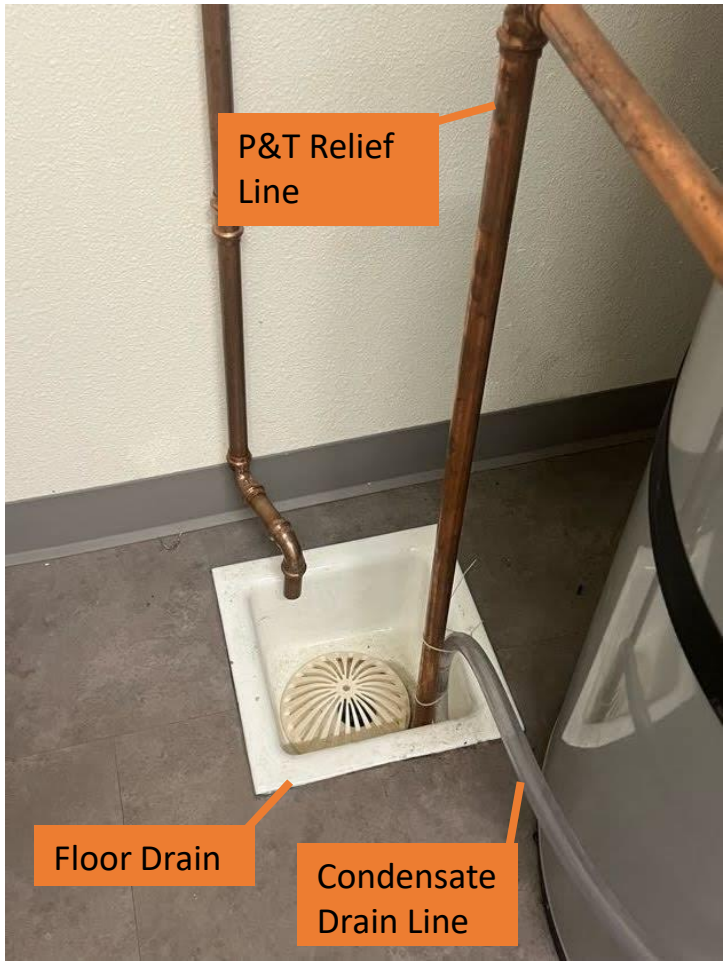
New Clarifying Language: Section (a) General Requirements:

- Building electrical system shall be sized to meet the future electric requirements of the electric ready equipment
- The following shall have sufficient capacity to supply full rated amperage at each electric ready appliance in accordance with the California Electrical Code:
  - Main service conduit,
  - Electrical system to the point specified in each subsection, and
  - Any on-site distribution transformers

Individual Heat Pump Water Heater Ready

If a gas or propane water heater is installed:

- Designate 39”x39”x96 for future HPWH, and
- Install a condensate drain
- Show in detail how the ventilation strategies will be met
- Specify electric panel, breaker space, and electrical feed prepared and labeled



Plan for future plumbing needs…

Central Heat Pump Water Heater Ready

Added electric-HPWH “Ready” requirements to Multifamily projects installing central gas water heating systems:

- Allocation of physical space for HPWH/Tanks, etc
- Provide for ventilation path/strategy
- Provide condensate drainage piping/receptacle
- Reserve physical space for electrical power and bus system of the main/distribution electrical switchboard
- References JA15 throughout

Gas Water Heating is Allowable, but …

Appendix JA15 – Qualification Requirements for Central Heat Pump Water Heater Ready

JA15.1 Purpose and Scope

Joint Appendix JA15 provides sizing requirements, for electric ready infrastructure installed with gas or propane water heating systems to meet the requirement for electric readiness specified in Title 24, Part 6, Section 160.9(f).

JA15.2 Electric Ready Requirements

JA15.2.1 Heat Pump Space Requirements

Space shall be reserved for future installation of central heat pump water heaters. The space reserved shall meet the following requirements:

(a) If the gas water heating system has an input capacity less than 200,000 Btu per hour, the minimum space reserved for the heat pump shall be 2.0 square feet per 10,000 Btu per hour input of the gas or propane water heating system, and the minimum linear dimension of the space reserved shall be 48 linear inches.

(b) If the gas water heating system has an input capacity greater than or equal to 200,000 Btu per hour, the minimum space reserved for the heat pump shall be 3.6 square feet per 10,000 Btu per hour input of the gas or propane water heating system, and the minimum linear dimension of the space reserved shall be 84 linear inches.

New Section 2025 Code

- Requirements based on size of GAS water heater, i.e.
  - < 200 kBtuh, or
  - > or equal to 200 kBtuh
- Solutions based on a factor of 10 kBtuh

JA15.2.2 Storage Tank Space Requirements

Space shall be reserved for future installation of hot water storage tanks. The space reserved shall meet the following requirements:

(a) If the input capacity of the gas water heating system is less than 200,000 Btu per hour, the minimum space reserved for the storage and temperature maintenance tanks shall be 4.4 square feet per 10,000 Btu per hour input of the gas or propane water heating system.

(b) If the input capacity of the gas water heating system is greater than or equal to 200,000 Btu per hour, the minimum physical space reserved for the storage and temperature maintenance tanks shall be 3.1 square feet per 10,000 Btu per hour input of the gas or propane water heating system.

JA15.2.3 Ventilation Requirements

The reserved pathway and penetrations through the building envelope shall meet the following requirements:

(a) If the input capacity of the gas water heating system is less than 200,000 Btu per hour, the minimum air flow rate shall be 70 CFM per 10,000 Btu per hour input of the gas or propane water heating system and the total external static pressure drop of ductwork and louvers shall not exceed 0.17 inches water column when the future heat pump water heater is installed.

(b) If the input capacity of the gas water heating system is greater than or equal to 200,000 Btu per hour, the minimum air flow rate shall be 420 CFM per 10,000 Btu per hour input of the gas or propane water heating system and the total external static pressure drop of ductwork and louvers shall not exceed 0.17 inches water column when the future heat pump water heater is installed.

JA15.2.4 Condensate Drainage Piping Requirements

The condensate drainage piping shall meet the following requirements:

(a) If the input capacity of the gas water heating system is less than 200,000 Btu per hour, condensate drainage shall be sized for 0.2 tons of refrigeration capacity per 10,000 Btu per hour input.

(b) If the input capacity of the gas water heating system is greater than or equal to 200,000 Btu per hour, condensate drainage shall be sized for 0.7 tons of refrigeration capacity per 10,000 Btu per hour input.

JA15.2.5 Electrical Requirements

The electrical system serving the heat pump shall meet the following requirements:

(a) If the input capacity of the gas water heating system is less than 200,000 Btu per hour, provide 0.1 kVA per 10,000 Btu per hour input.

(b) If the input capacity of the gas water heating system is greater than or equal to 200,000 Btu per hour, provide 1.1 kVA per 10,000 Btu per hour input.

The electrical system serving the temperature maintenance tank shall meet the following requirements:

(c) If the input capacity of the gas water heating system is less than 200,000 Btu per hour, provide 1.0 kVA per 10,000 Btu per hour input.

(d) If the input capacity of the gas water heating system is greater than or equal to 200,000 Btu per hour, provide 0.6 kVA per 10,000 Btu per hour input.

end.

New Construction Prescriptive

New Multifamily Section 170.0

- Section 170. –General
- Section 170.1 –Performance Approach
- Section 170.2 –Prescriptive Approach
- Apply to dwelling units and common use areas in multifamily buildings.
- Nonresidential occupancies in a mixed occupancy building shall comply with nonresidential requirements in Sections 120.0 through 141.1.

Section 170.2 Prescriptive Approach:

(a) Building Envelope

(b) Daylighting –Large Enclosed Spaces

(c) Space Conditioning and Ventilation Systems

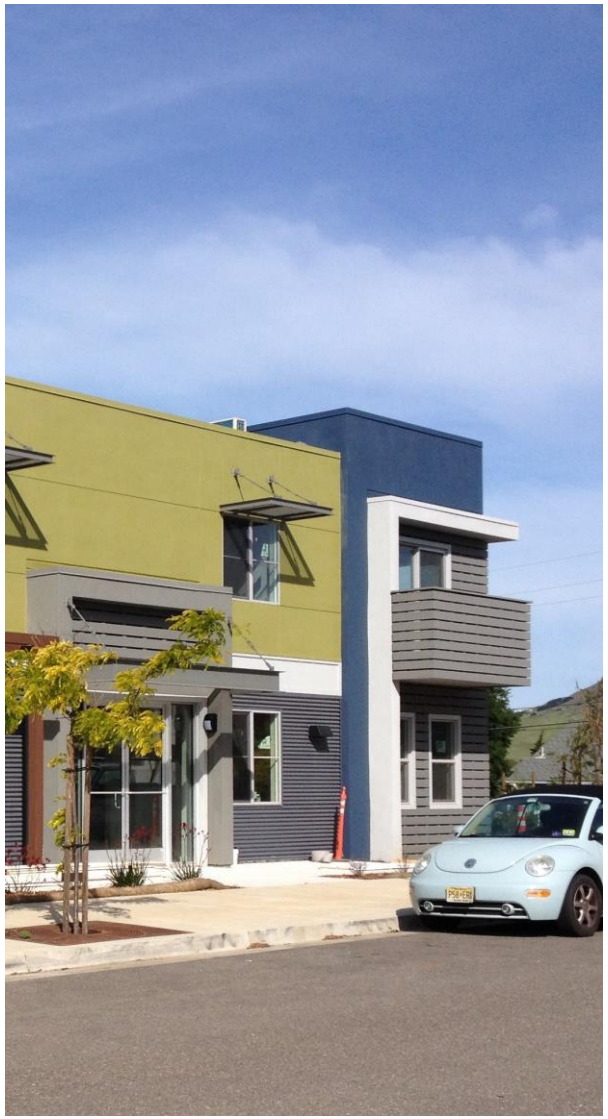
(d) Water Heating Systems

(e) Lighting –Indoor, Outdoor, Signs

(f) Photovoltaic (PV/Solar) -3 Stories or less

(g) Photovoltaic (PV/Solar) -4 Stories or more

(h) Battery Storage Systems



Roof and Ceiling Insulation

- **Table 170.2-A** outlines prescriptive multifamily requirements by climate zone and Roof Type
- Option B: Attic –Ducts in attic
- Option C: Attic –Ducts in conditioned space
- Option D: Non-Attic Roof

Few changes between 2022 and 2025

Note: Option B and C roof types are described with R-values, but Option D is described with U-factors.

Option D –Non-Attic Roof or 'Cathedral Ceiling'

TABLE 170.2-A ENVELOPE COMPONENT PACKAGE – Multifamily Standard Building Design

Building Component - Roofs and Ceilings	CZ 1	CZ 2	CZ 3	CZ 4	CZ 5	CZ 6	CZ 7	CZ 8	CZ 9	CZ 10	CZ 11	CZ 12	CZ 13	CZ 14	CZ 15	CZ 16
Option D[11]-Metal Building U-factor	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041	0.041
Option D[11]-Wood Framed and Other U-factor	0.028	0.028	0.034	0.028	0.034	0.034	0.039	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028	0.028
Option D[11] Low-Sloped-Aged Solar Reflectance	NR	~~NR~~0.63	NR	~~NR~~0.63	NR	~~NR~~0.63	~~NR~~0.63	~~NR~~0.63	0.63	0.63	0.63	~~NR~~0.63	0.63	0.63	0.63	NR
Option D[11] Low-Sloped-Thermal Emittance	NR	~~NR~~0.75	NR	~~NR~~0.75	NR	~~NR~~0.75	~~NR~~0.75	~~NR~~0.75	0.75	0.75	0.75	~~NR~~0.75	0.75	0.75	0.75	NR
Option D[11] Low-Sloped-Solar Reflectance Index	NR	~~NR~~75	NR	~~NR~~75	NR	~~NR~~75	~~NR~~75	~~NR~~75	75	75	75	~~NR~~75	75	75	75	NR
Option D[11] Steep-Sloped-Aged Solar Reflectance	NR	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	NR
Option D[11] Steep-Sloped-Thermal Emittance	NR	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	NR
Option D[11] Steep-Sloped-Thermal Emittance	NR	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	NR

Reminder:

- Low-Sloped has rise to run ratio < 2:12
- Steep-Sloped has rise to run ration 2:12 or greater

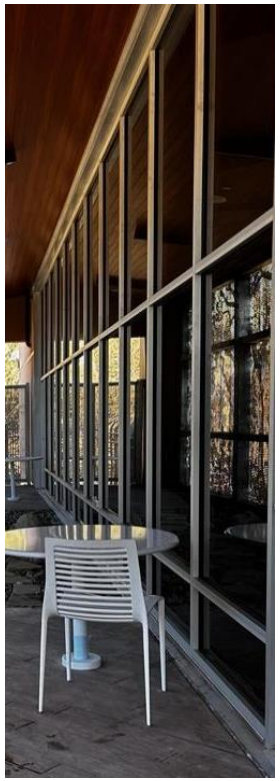
Key Take Away for 2025:
Low-Sloped –Climate Zones (CZ) 2, 4, 6-8, and 12 have new Cool Roof requirements

Window Energy Performance Values –2025 Update

Curtain Wall / Storefront Excerpt:

TABLE 170.2-A ENVELOPE COMPONENT PACKAGE – Multifamily Standard Building Design (continued)

Building Component - Fenestration	CZ 1	CZ 2	CZ 3	CZ 4	CZ 5	CZ 6	CZ 7	CZ 8	CZ 9	CZ 10	CZ 11	CZ 12	CZ 13	CZ 14	CZ 15	CZ 16
Curtain Wall/ Storefront[7] - 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[7] - Maximum RSHGC~~, three or fewer habitable stories~~	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[7] - Maximum RSHGC, four or more habitable stories~~	~~0.35~~	~~0.26~~	~~0.26~~	~~0.26~~	~~0.26~~	~~0.26~~	~~0.26~~	~~0.26~~	~~0.26~~	~~0.26~~	~~0.26~~	~~0.26~~	~~0.26~~	~~0.25~~	~~0.26~~	~~0.25~~
Curtain Wall/ Storefront[7] - Minimum VT, ~~four or more habitable stories~~ common use area	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



Other Windows UPDATES:

- **U-0.28** decrease for CZ 1, 3-5, 11, and 13-16.
- **U-0.30** no change for CZ 2, 8-10, and 12
- **U-0.34** no change for CZ 6 and 7

- **RSHGC - NR** no change for CZ 1, 3, 5, and 16
- **RSHGC-0.23** no change for CZ 2, 4, 6-15

Reminder: RSHGC = *Relative* Solar Heat Gain Coefficient

Key Take Away for 2025:

- Low-rise / high-rise distinction eliminated; most values 'rolled into' the low-rise requirements
- Some high-rise catagories became "common use area" requirements

Space Conditioning –Dwelling Units Only

- **3 Stories or less**
  - CZ 1-15: space conditioning shall be a **heat pump**
  - CZ 16: space conditioning shall be a **furnace with air conditioner**
- **4+ Stories**
  - CZ 2-15: space conditioning shall be a **heat pump**
  - CZ 1 and 16: space conditioning shall be **a dual-fuel heat pump**

Note: No space conditioning equipment requirement for the common areas

No Change for 2025

Low Leakage Ducts in Conditioned Space Performance Credit - LMCV-MCH-21-H

DUCT LOCATION

CALIFORNIA ENERGY COMMISSION CEC-LMCV-MCH-21-H

SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

CERTIFICATE OF VERIFICATION

Note: This table completed by HERS Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

A. General Information

Note: Submit one Installation Certificate for each duct system that is taking credit for duct location.

01	SC System Identification or Name	
02	SC System Location or Area Served	
03	Indoor Unit Name or Description of Area Served	
04	Status – Less than 12 ft Ducts in Conditioned Space Performance Credit	
05	Status – Ducts Located In Conditioned Space Performance Credit	
06	Status – Duct System Located Entirely in Directly Conditioned Space, No Insulation Requirement	
07	Status – Portions of Ducts Located in Conditioned Space, R-6 Exception	

B. 12 Linear Feet or Less of Duct Located Outside of Conditioned Space - RA3.1.4.1.2

01	A visual inspection shall confirm space conditioning systems with air handlers located outside the conditioned space have 12 linear feet or less of duct located outside the conditioned space including air handler and plenum.	
02	Verification Status:	☐ Pass - all applicable requirements are met; or ☐ Fail - one or more applicable requirements are not met. Enter reason for failure in corrections notes field below; or ☐ All N/A - This entire table is not applicable
03	Correction Notes:	

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met unless otherwise noted in the Verification Status and the Correction Notes.

C. Ducts Located In Conditioned Space - RA3.1.4.1.3

01	A visual inspection shall confirm the space conditioning system is located entirely in conditioned space.	
02	Verification Status:	☐ Pass - all applicable requirements are met; or ☐ Fail - one or more applicable requirements are not met. Enter reason for failure in corrections notes field below; or ☐ All N/A - This entire table is not applicable

Benefits:

- Performance Method 'Credit' for improved energy efficiency
- Trade-Off 'Credit' can be used to off-set other energy losing features
- Ducts entirely in conditioned space - insulation not required

HERS Scope:

- Visual Inspection of Duct Location
- Testing: Duct Leakage to Outside from Fan Pressurization of Ducts

Variable Capacity Heat Pump Compliance Credit
LMCI-MCH-33-H

VARIABLE CAPACITY HEAT PUMP COMPLIANCE CREDIT

CALIFORNIA ENERGY COMMISSION

CEC-LMCI-MCH-33-H

SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

CERTIFICATE OF INSTALLATION

Note: This table completed by HERS Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

A. VCHP System Information

Procedures for verification of VCHP compliance credit eligibility are described in the Energy Code Reference Appendices Section RA3.4.4.3.

01	SC System ID/Name from LMCC	
02	SC System Description of Area Served	
03	Conditioned Floor Area Served by the System (ft²)	
04	Status: Refrigerant charge verification from MCH-25	
05	Verification: Is conditioned airflow supplied to all habitable rooms in accordance with the procedure in RA3.1.4.1.7?	
Notes:		

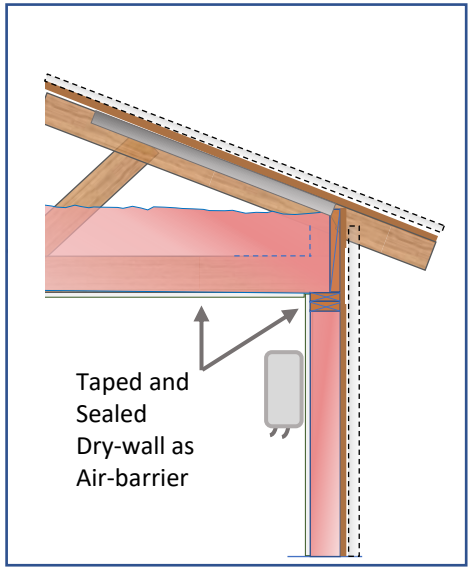
B. VCHP Indoor Unit Information

Ducted indoor units are required to be certified to the Energy Commission as low static systems, and included in the list of certified indoor units published on the Energy Commission website at https://www.energy.ca.gov/rules-and-regulations/building-energy-efficiency/manufacturer-certification-building-equipment

01	02	03	04	05	06	07	08	09
Indoor Unit Name or Description of Area Served	Installed Indoor Unit Type	Indoor Unit Duct Status	Conditioned Floor Area Served By The Indoor Unit (ft²)	Number of Air Filter Devices on Indoor Unit	Indoor Unit Required Minimum System Airflow Rate (cfm)	Status: Airflow Rate Verification from MCH-23	Is Field Verification of Default Non-Continuous Fan Operation Required?	Verification: Is Ducted Low Static Indoor Unit Certified to CEC?
Notes:								

Registration Number: Registration Date/Time: HERS Provider:

CA Building Energy Efficiency Standards - 2022 Low-Rise Multifamily Compliance January 2022



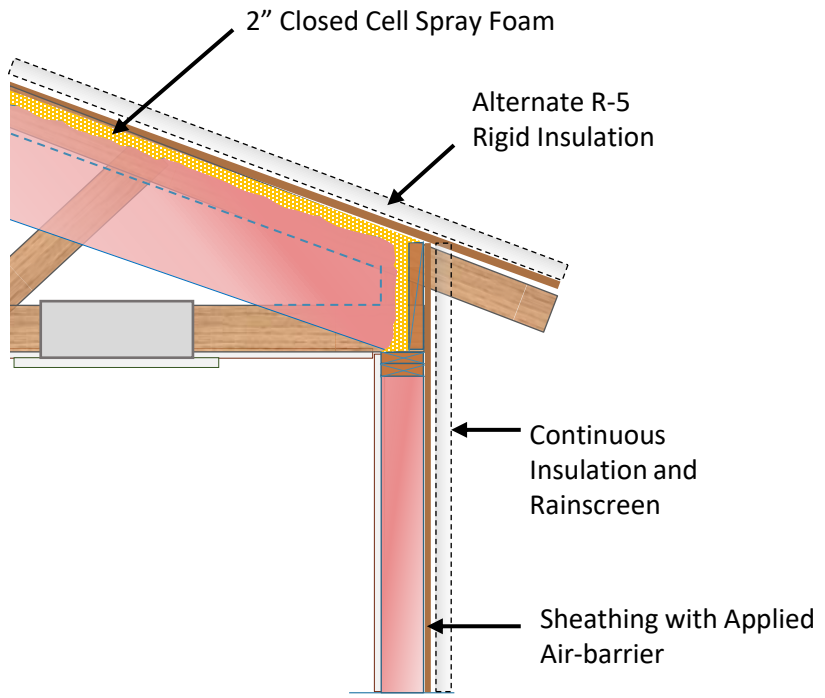
Ductless Indoor Unit within the Air and Thermal Boundary

HERS Work Flow:

- Triggered on CF1R
- Framing Stage - Construction Site Meeting
- Triggers MCH-25-H Refrigerant Charge
- Verification at both Install and Final

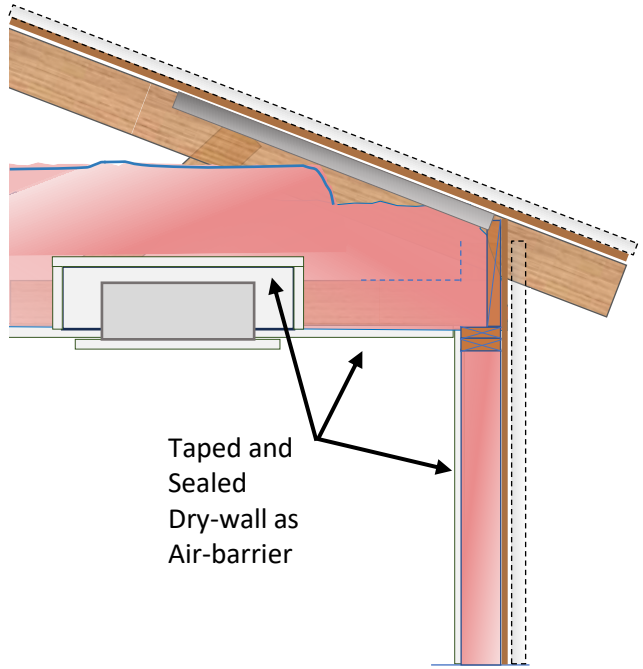
Reminder: VCHP Compliance Option –Ceiling Recessed Units Impacts Envelope Enclosure

Indoor units shall be installed within the air and thermal boundaries



Unvented Attic with a Continuous Air and Thermal Boundary

Ductless Recessed-Ceiling



Vented Attic with a Continuous Air and Thermal Boundary

ERV & HRV –see Table 170.2-K Mech Component Package

3 stories or less in ~~CZ 4-10~~: **CZ 5-10, and 15 –2025 Update**

- **If heat pump** space conditioning system is installed to meet requirements, a balanced ventilation system without an ERV or HRV shall have a **fan efficacy ≤0.4 W/cfm**

4+ stories in ~~CZ 1, 2, 11-16~~: **CZ 1, 2, 4, 11-14, 16 –2025 Update**

- Balanced ventilation systems using ERV or HRV for **individual dwelling** units shall have a min sensible **recover efficiency ≥67% rated at 32ºF and fan efficacy ≤0.6 W/cfm**
- Balanced ventilation systems using ERV or HRV **serving multiple units** shall have a min sensible **recover efficiency ≥67%** rated at 32ºF; **Fan efficacy per 170.2(c)4a** (common area fans); and Recover bypass or control to directly **economize** with ventilation air based on outdoor air temperature limits per **Table 170.2-G**

New 2025 Subsection: v. Dwelling unit ventilation system requirements.

All HRV/ERV systems serving individual dwelling units shall have a Fault Indicator Display (FID) that is manufacturer certified in compliance with the requirements in Joint Appendix JA17.4. The FID certification shall be verified by an ECC-Rater.

Domestic Hot Water

Water Heating Systems –Revised language and minor updates under the 2025 Code

Individual Dwelling Units

- 240-volt HPWH and ‘compact distribution’
- NEEA-rated Tier 3 HPWH
- Gas or propane 200 kBtuh or less instantaneous water heater

HPWH Central System

- HW return to recirc tank
- Recirc WH - electric
- Single pass plumbed in series & parallel for multipass
- Primary storage tank temp setpoint ≥135ºF and recirc loop ≤ 10ºF than primary
- Minimum HPWH compressor cut-off temp ≤ 40ºF

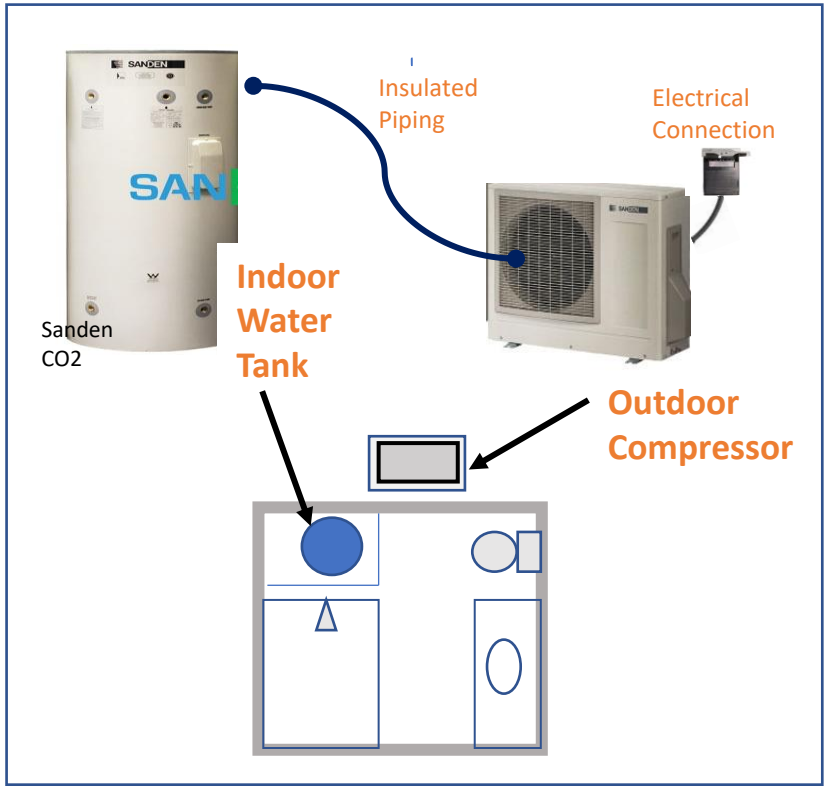
Gas/Propane Central

- CZ 1-9: Total input rating ≥1,000,000 Btu/hr & min. 90% thermal efficiency
- Solar WH system w/ min. solar savings fraction of:
  - CZ 1-9: 0.20
  - CA 10-16: 0.35
  - 5% reduction w/ DWHR
- Recirc System (<8 units exempt)

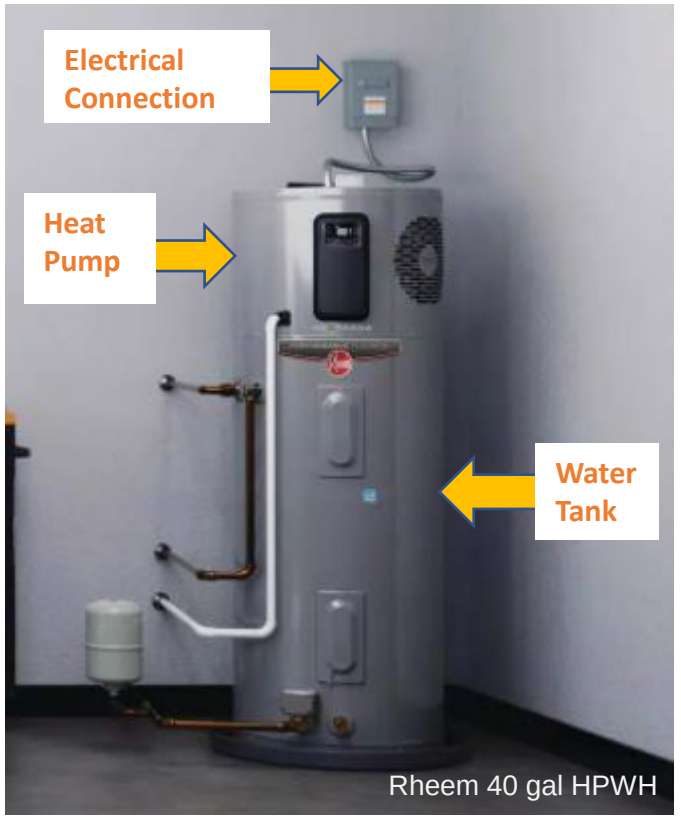
Prescriptive –Individual Dwelling Units

170.2(d)1

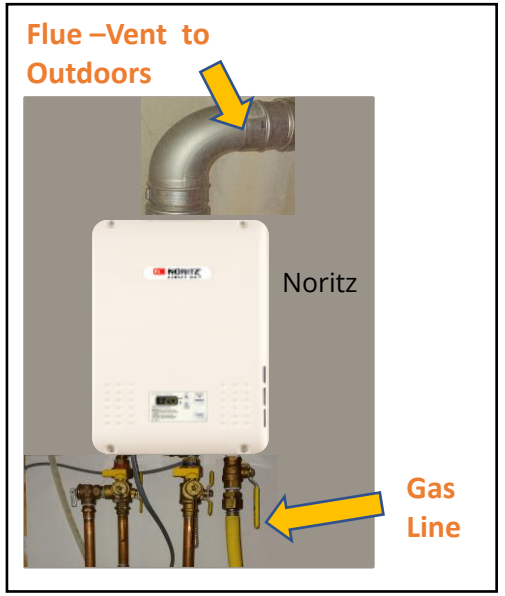
Split-System Heat Pump



Integrated Heat Pump



Gas On-Demand

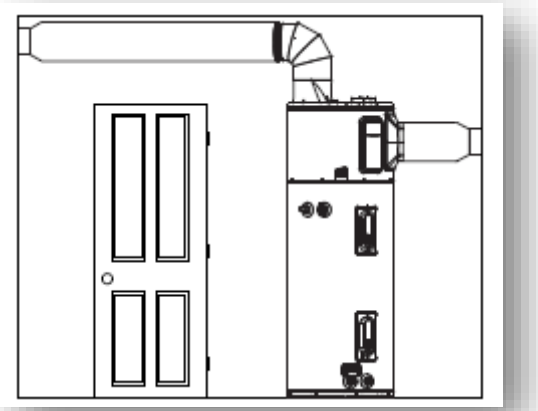


Under 2025 Code:
Allowable only for buildings 4 habitable stories or greater.

Under 2025 Code:
A 120V HPWH may be installed for new dwelling unit with one bedroom or less.

Design Considerations – Integrated HPWH

- Integrated HPWH tanks taller than standard gas or electric units
- Requires clearances on the sides, top and back, for air flow and access to the air filters
- Operating Temp between 45 F and 90 -110F
- Noise typically around 50 db
- System creates cold dehumidified air and condensate
- Need 700 – 1000 cubic feet volume, or ducted vent kit



Central Domestic Hot Water

Gas or propane system is allowed with the following:

- A recirculation system (does not have to be dual loop)
- CZ 1-9: Total input rating ≥1,000,000 Btu/hr with a minimum thermal efficiency of 90%
- Solar water heating system with a minimum solar savings fraction of:
  - CZ 1-9 require 0.20 SSF
  - CZ 10-16 require 0.35 SSF

Performance Method is often used to avoid the solar thermal system requirement.

New Under 2025:
The central system shall have a recirculation system with a mechanical or digital thermostatic master mixing valve on each distribution supply and return loop. Exception for building with 8 dwellings or less.

Central Domestic Hot Water

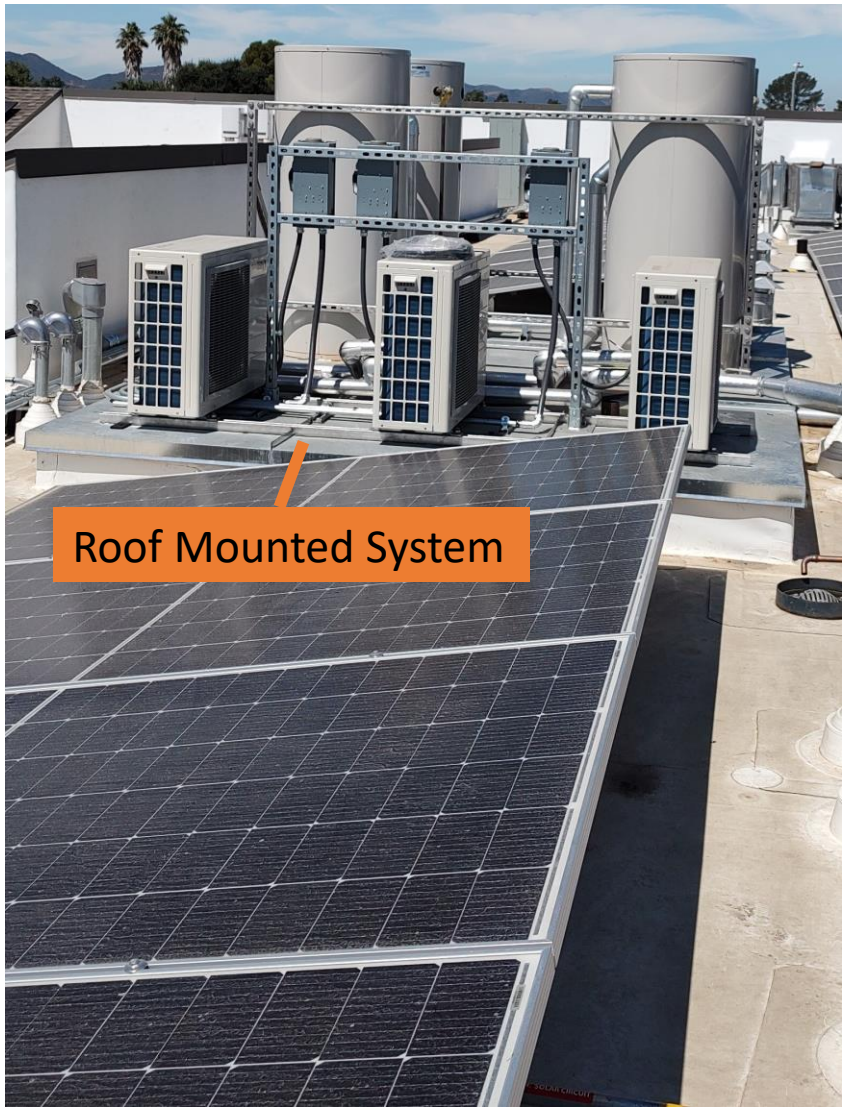
Heat Pump System with the following:

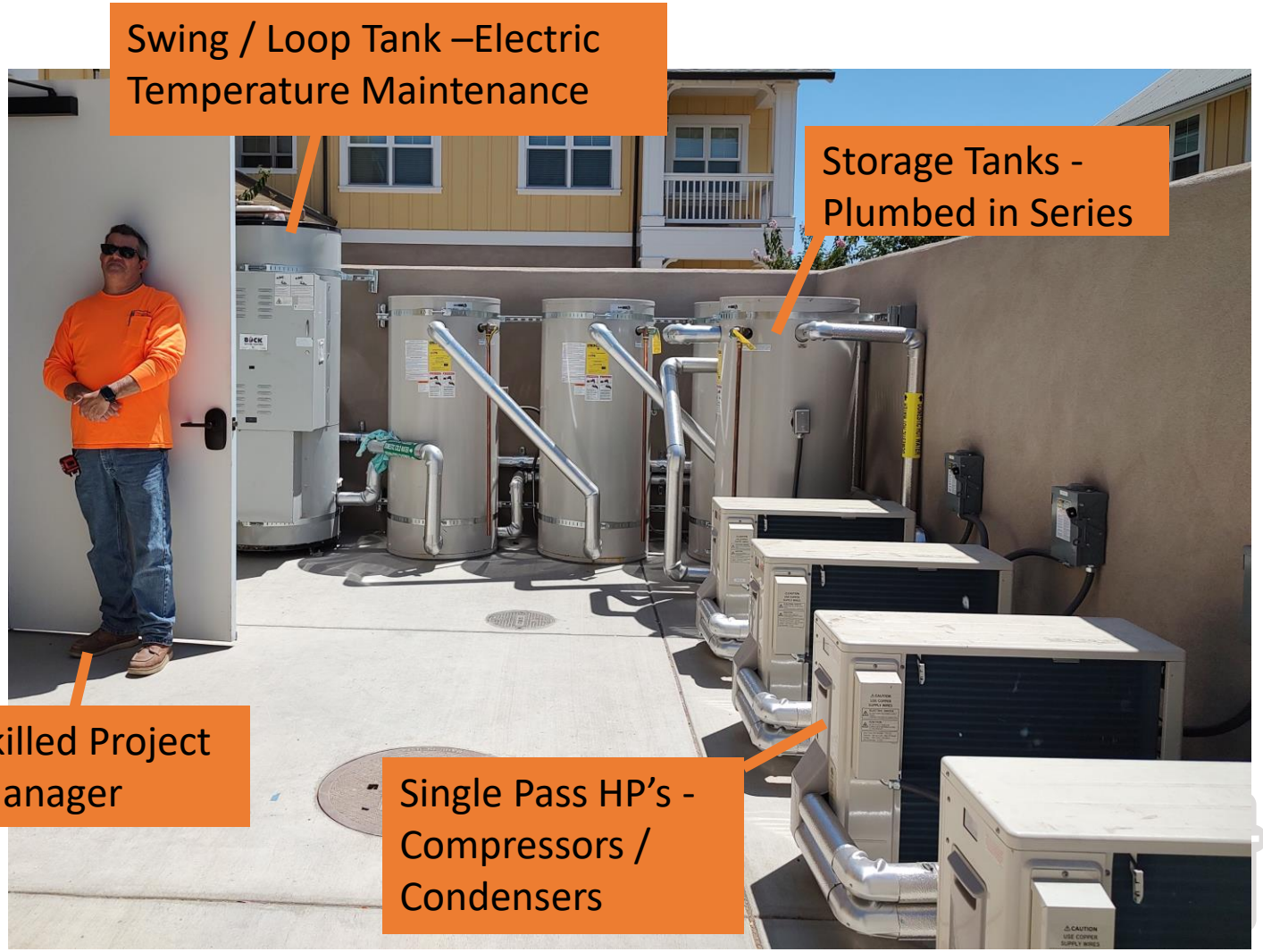
2025 Code Update:
The primary heat pump water heater shall be a single-pass heat pump water heater

- ~~For systems with *single pass primary heat pump* water heater, the primary thermal storage *tanks shall be plumbed in series* if multiple tanks are used~~
- *Hot water return* from recirculation loop shall *connect to a recirculation loop tank*
- Fuel source for the recirculation *loop tank* shall be *electricity*
- Primary storage tank temp setpoint ≥135ºF
- Recirculation loop tank temp setpoint should be at least 10ºF lower than primary thermal storage tank
- Minimum HPWH compressor cut-off temp ≤ 40ºF

New Under 2025:
The central system shall have a recirculation system with a mechanical or digital thermostatic master mixing valve on each distribution supply and return loop. Exception for building with 8 dwellings or less.

Central Heat Pump System – Distributed SanCO2 Systems





Project: Harry's House – Santa Barbara County

Solar Photovoltaic (PVs) and Battery Energy Storage Systems (BESS)

Low-Rise Multifamily (3 Stories or less)

- **Solar Ready (Mandatory Measure 110.10),** if PV is *not* triggered/installed
- **Solar PV** is required, exceptions apply.
- **BESS** is optional; *credit is available* under the Performance Method

Note: "Battery Ready" is only for Single Family Occupancy types.

High-Rise Multifamily (4 Stories or more)

- **Solar Ready (Mandatory Measure 110.10),** if PV is *not* triggered/installed, *up to 10 story building*.
- **Solar PV** is required, exceptions apply.
- **BESS** is required when Solar PV is triggered, exceptions apply.

Solar Photovoltaic (PV)

PV System Size (kW dc)

Prescriptive sizing equation is determined by the number of stories, i.e. low-rise (3 stories or less) or high-rise (4 stories or more)

SARA –Solar Access Roof Area

Area of a buildings' roof space capable of supporting PV system

- Including covered parking areas, and carports and other newly constructed structures onsite that are compatible with supporting a PV system per CBC 1511.2
- Exceptions: Any roof area that has <70% annual solar access

PV System for ≤3 stories

$$kW_{PV} = \frac{CFA \times A}{1000} + (N_{DU} \times B)$$

EQUATION 170.2-C

CFA: Conditioned Floor Area

N_{DU}: Number of Dwelling Units

A: Climate Zone Factor

B: Dwelling Adjustment Factor

OR *2025 Code Update:*

PV size = 14 W/sq ft x SARA for low-sloped

PV size = 18 W/sq ft x SARA for steep-sloped

No PV required if:

- PV size < ~~1.8 kWdc~~; 4 kWdc –2025 Update
- SARA < 80 sq ft contiguous

Bonus: Size reduction of 25% if installed with battery

Pismo Terrace Apartments, Pismo Beach, CA

CFA = 16,032 SF Climate Zone 5

N_{DU} = 27

kW_{PV} = [(16,032 x 0.585)/1000]+(27 x 1.06)

kW_{PV} = 9.378 + 28.62

kW_{PV} = 37.99 = 38 kW system

2025 Code Update: New minimum SARA PV sizes

Table for Adjustment Factors

Table 170.2-T: CFA (A) & Dwelling Unit (B) Adjustment Factors					
Zone	A	B	**Zone**	A	B
1	0.793	1.27	**9**	0.613	1.36
2	0.621	1.22	**10**	0.627	1.41
3	0.628	1.12	**11**	0.836	1.44
4	0.586	1.21	**12**	0.613	1.40
5	0.585	1.06	**13**	0.894	1.51
6	0.594	1.23	**14**	0.741	1.26
7	0.572	1.15	**15**	1.56	1.47
8	0.586	1.37	**16**	0.59	1.22

PV System for >4 stories

$$kW_{PV} = \frac{CFA \times A}{1000}$$

EQUATION 170.2-D

CFA: Conditioned Floor Area

A: Climate Zone Factor

No PV required if:

- PV size < 4 kWdc;
- SARA < 80 sq ft contiguous or < 3% of the CFA
- Snow loading parameters

OR

2025 Code Update:

PV size = 14 W/sq ft x SARA for low-sloped

PV size = 18 W/sq ft x SARA for steep-sloped

VTA Housing Ohlone Station, San Jose, CA

HIGHRISE (6 Stories, 73 units)	HIGHRISE (12 Stories, 190 units)
CFA = 56,168 SF	CFA = 174,483 SF
Climate Zone 4	Climate Zone 4
kW_{PV} = 56,168 x 2.21/1000	kW_{PV} = 174,483 x 2.21/1000
kW_{PV} = 124,131.28/1000	kW_{PV} = 385,607.43/1000
kW_{PV} = 124.13 = 125 kWdc	**kW_{PV} = 385.61 = 386 kWdc**

2025 Code Update: New minimum SARA PV sizes

Table for Capacity Factors –2022 Code

Table 170.2-U: PV CAPACITY FACTORS			
Building Use	Zones 1, 3, 5, 16	Zones 2, 4, 6-14	Zone 15
Grocery	2.62	2.91	3.53
High-Rise Residential	1.82	2.21	2.77
Office	2.59	3.13	3.80
Retail	2.62	2.91	3.53
School	1.27	1.63	2.46
Warehouse	0.39	0.44	0.58
Auditorium, Hotel, Library, Restaurant, Theatre	0.39	0.44	0.58

Table for Adjustment Factors –2025 Code

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

Building Type	CZ 1	CZ 2	CZ 3	CZ 4	CZ 5	CZ 6	CZ 7	CZ 8	CZ 9	CZ 10	CZ 11	CZ 12	CZ 13	CZ 14	CZ 15	CZ 16
Events & 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 & 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

Battery Energy Storage – Applies to high-rise (4 stories or more) when PV systems are required

Energy Capacity (kWh)

- $kWh_{batt} = kW_{PVdc} \times B/D^{0.5}$

Power Capacity (kW)

- $kW_{batt} = kW_{PVdc} \times C$

where, PV Size = kW_{PVdc} from Equation 170.2-D, and

D = Rated single charge-discharge cycle AC to AC (round-trip) efficiency of the battery storage system.

Table 170.2-V – Battery Storage Capacity Factors

	Factor B – Energy Capacity	Factor C – Power Capacity
Storage-to-PV Ratio	**Wh/W**	**W/W**
Grocery	1.03	0.26
High-Rise Multifamily	1.03	0.26
Office, Financial Institutions, Unleased Tenant Space	1.68	0.42
Retail	1.03	0.26
School	1.87	0.46
Warehouse	0.93	0.23
Auditorium, Convention Center, Hotel/Motel, Library, Medical Office Building/Clinic, Restaurant, Theater	0.93	0.23

Battery Exemptions:

- If installed PV system size is less than 15% of the size determined by Equation 170.2-D
- If less than 10 kWh rated energy capacity
- Single tenant buildings <5,000 sq.ft CFA

Battery Energy Storage System (BESS) – 2025 Code

All buildings **required** to have a **PV system** shall also have a **battery storage system**.

Reminder: Battery system must meet **both** rated **energy** capacity (kWh) and the rated **power** capacity (kW) Calculate the energy and power capacities for each occupancy type in mixed use buildings, and sum the values.

New formulas

Rated Energy Capacity :

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

CFA: Conditioned Floor Area
B: BESS Capacity Factor in Wh/sf from Table 170.2-V
C is the rated single charge-discharge cycle AC to AC efficiency of the BESS
(Between 0.80 and 0.95 is common.)

SARA Adjusted Rated Energy Capacity :

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

kW_{PVdc} : From PV Capacity calculation

Rated Power capacity:

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

Table for Capacity Factors –2025 Code

TABLE *170.2-V – BESS Capacity Factors (Wh/ft² of conditioned floor area)*

Building Type	CZ 1	CZ 2	CZ 3	CZ 4	CZ 5	CZ 6	CZ 7	CZ 8	CZ 9	CZ 10	CZ 11	CZ 12	CZ 13	CZ 14	CZ 15	CZ 16
Events & 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, Medical Office Building/Clinic	NR[1]	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[1]	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 & 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

Footnote to TABLE 170.2-V:

1. NR = Not Required

Battery Storage

Exceptions:

- If installed PV system size < 15% of the size determined by Equation 170.2-D
- In buildings with system requirements with < 10 kWh rated capacity

Example of a Commercial System

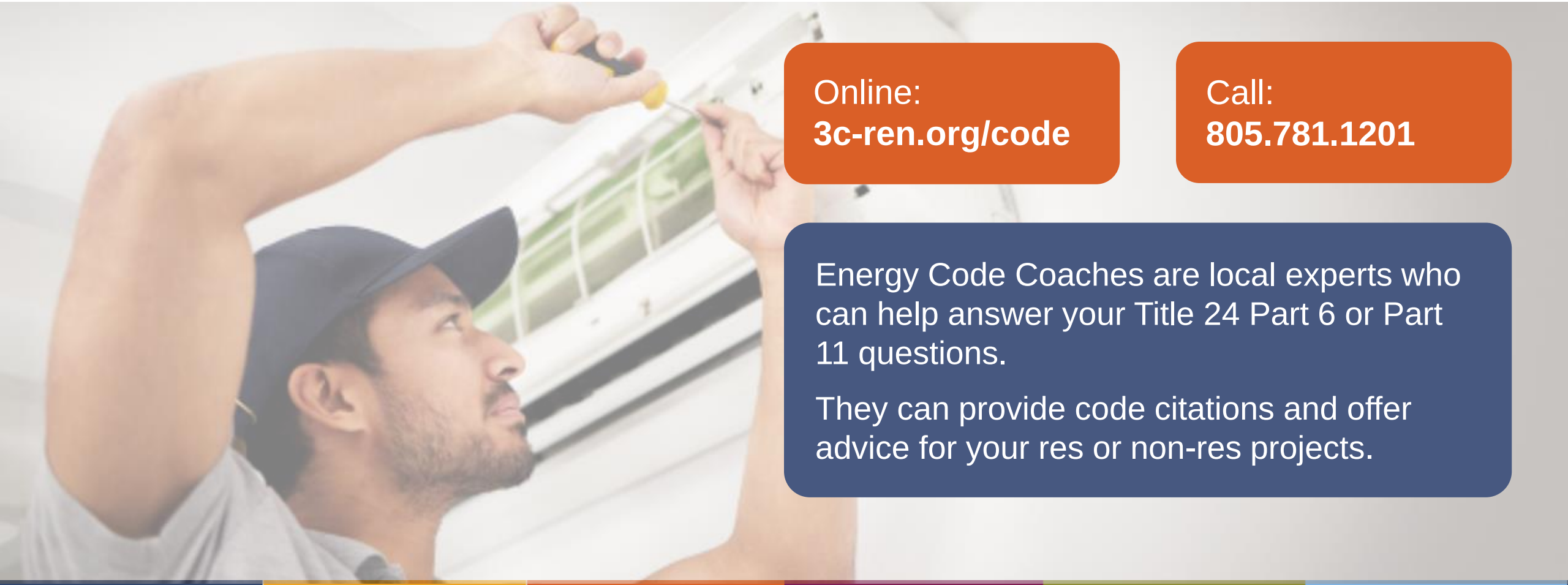
eSpire 280 Energy Storage System

Safe Technology & Multi-level Protection

The solution uses the best-in-class Tier 1 Lithium Iron Phosphate (LFP) chemistry forthe highest level of safety, thermal stability, and reliability; An integrated, multi-levelBattery Management System (BMS) monitors, optimizes, and balances the system.

Questions about Title 24?

3C-REN offers a *free* Code Coach Service



Online:
3c-ren.org/code

Call:
805.781.1201

Energy Code Coaches are local experts who can help answer your Title 24 Part 6 or Part 11 questions.

They can provide code citations and offer advice for your res or non-res projects.

Multifamily Home Energy Savings

Rebates for eligible multifamily buildings

Who does this program serve?

Owners of multifamily properties with 5+ units in San Luis Obispo, Santa Barbara and Ventura Counties.

What rebates are available?

Up to $1,000 per unit when 3 or more energy upgrades are installed. Additional rebates ranging from $250-$1,500 per upgrade for advanced high-performing technologies such as heat pumps.

Why should I participate?

To reduce operating and maintenance costs, improve the comfort and safety of residents, and minimize your carbon footprint.

What upgrades are covered?

No-cost energy consulting is available to scope upgrades such as:

- **Central and in-unit domestic hot water systems**
- **Wall, window, and roof insulation**
- **Lighting and appliances**
- **Heating and cooling systems**

How to Participate

1. Fill out an interest form online at www.3C-REN.org/multifamily-form
2. A Technical Assistant will reach out to learn more about your goals and needs.
3. You and your Technical Assistant will work together to select an eligible scope of work.
4. Reserve your rebates!
5. A contractor of your choice installs approved property enhancement measures.
6. Claim and deposit rebates as you and your tenants enjoy reduced bills and greater comfort!

QUESTIONS?

multifamily@3C-REN.org

Closing

Continuing Education Units Available

- Contact dresurreccion@co.slo.ca.us for AIA and ICC LUs

Coming to Your Inbox Soon!

- Slides & Recording

2025 Energy Code Implementation Series:

- On-demand: Single Family
- On demand: Nonresidential
- On-demand: Single Family Additions and Alterations
- On-demand: ADU

Upcoming Courses:

- July 29 – What Energy Consultants Need to Know About QII
- Aug 12 – Next Generation Passive Solar in Santa Barbara
- Aug 13 – CALGreen Code – 2025 Update

Any phone numbers who joined? Please share your name!

Thank you!

More info: **3c-ren.org**

Questions: **info@3c-ren.org**

Email updates: **3c-ren.org/newsletter**

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