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

2025 Energy Code in Practice: Single Family Residential

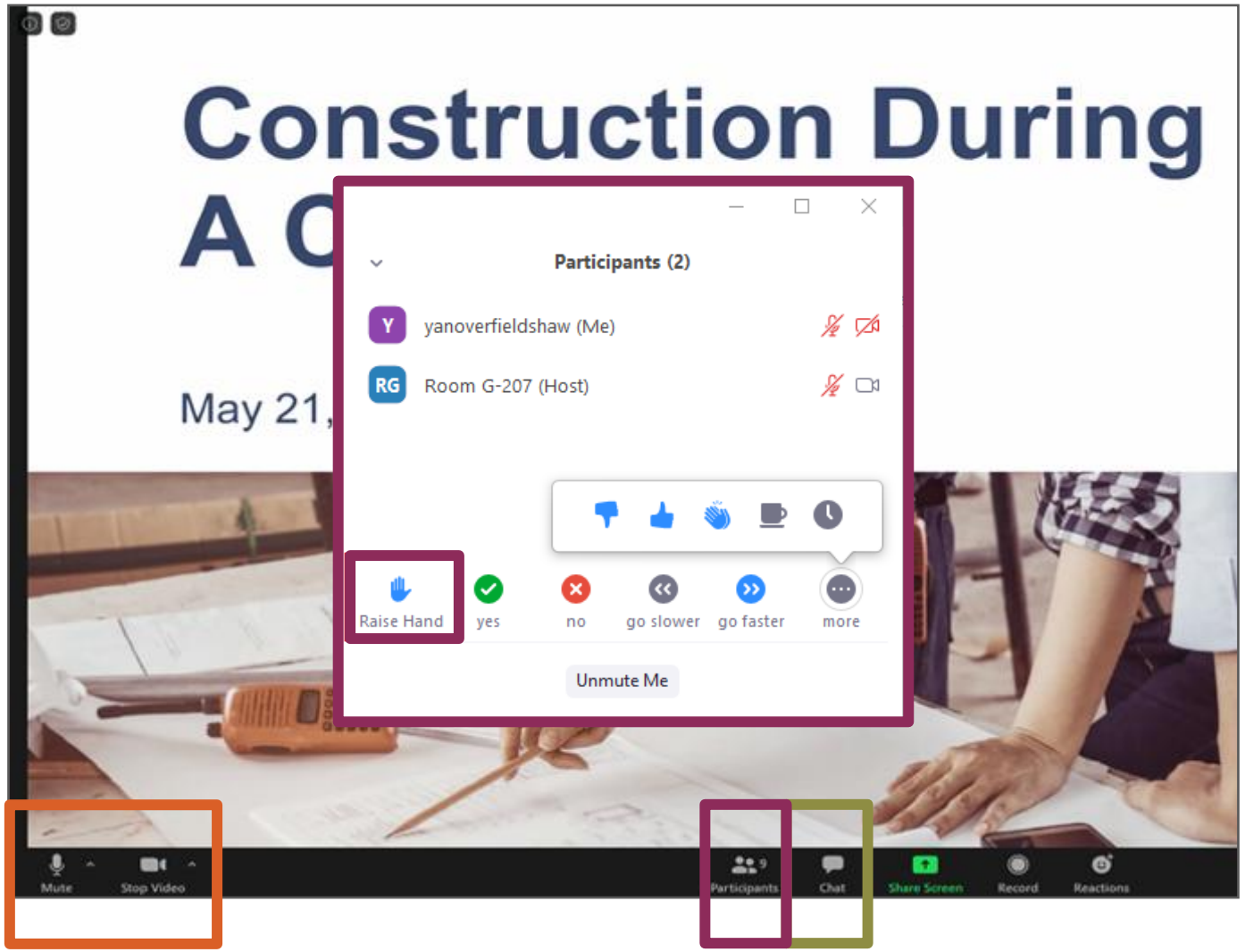
Jennifer Rennick & Grant Murphy
In Balance Green Consulting

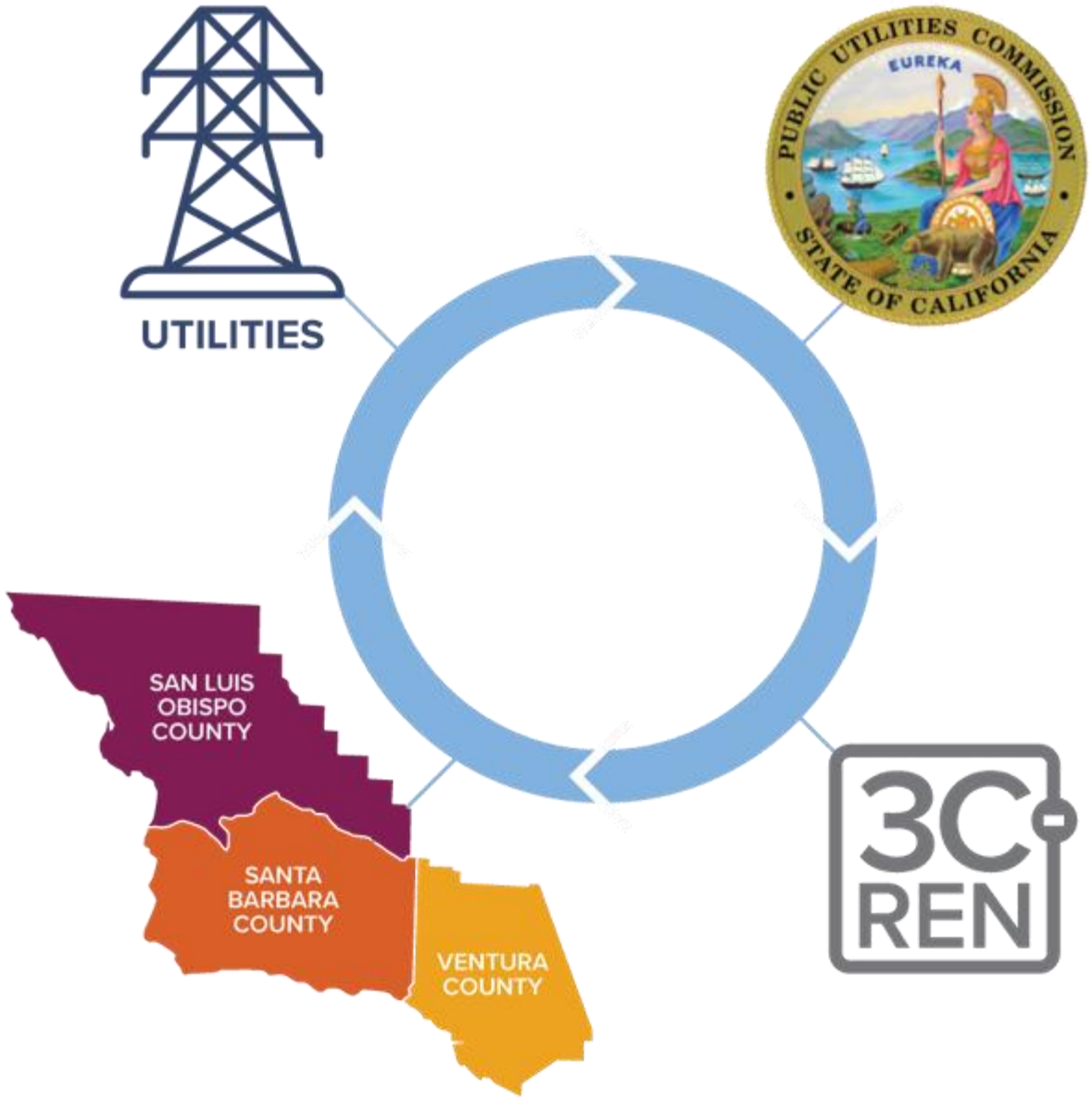
February 4, 2026

Before We Begin

Here are some quick reminders:

- Call in? Please **share** full name to confirm attendance
- To receive AIA LUs, you **must attend** at least 80% of the training. Attendance will be verified
- Use the "**Chat**“ to share questions or comments
- Slides/recording are **shared** after most events and can be found on 3C-REN's on-demand page
- 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

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2025 Energy Code in Practice

In this series, we'll walk through key components for each building occupancy type, providing sample details, photos of installations and potential pitfalls to avoid. Highlighting 2025 changes throughout, this course is intended for designers, builders and building officials.

- ***2025 Energy Code in Practice: Single Family Residential (SFR)***
- 2025 Energy Code in Practice: Single Family Residential Additions and Alterations
- 2025 Energy Code in Practice : Accessory Dwelling Units (ADUs)
- 2025 Energy Code in Practice : Multi-Family Residential
- 2025 Energy Code in Practice : Non-Residential

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

Today's Learning Objectives

- Understand the 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.

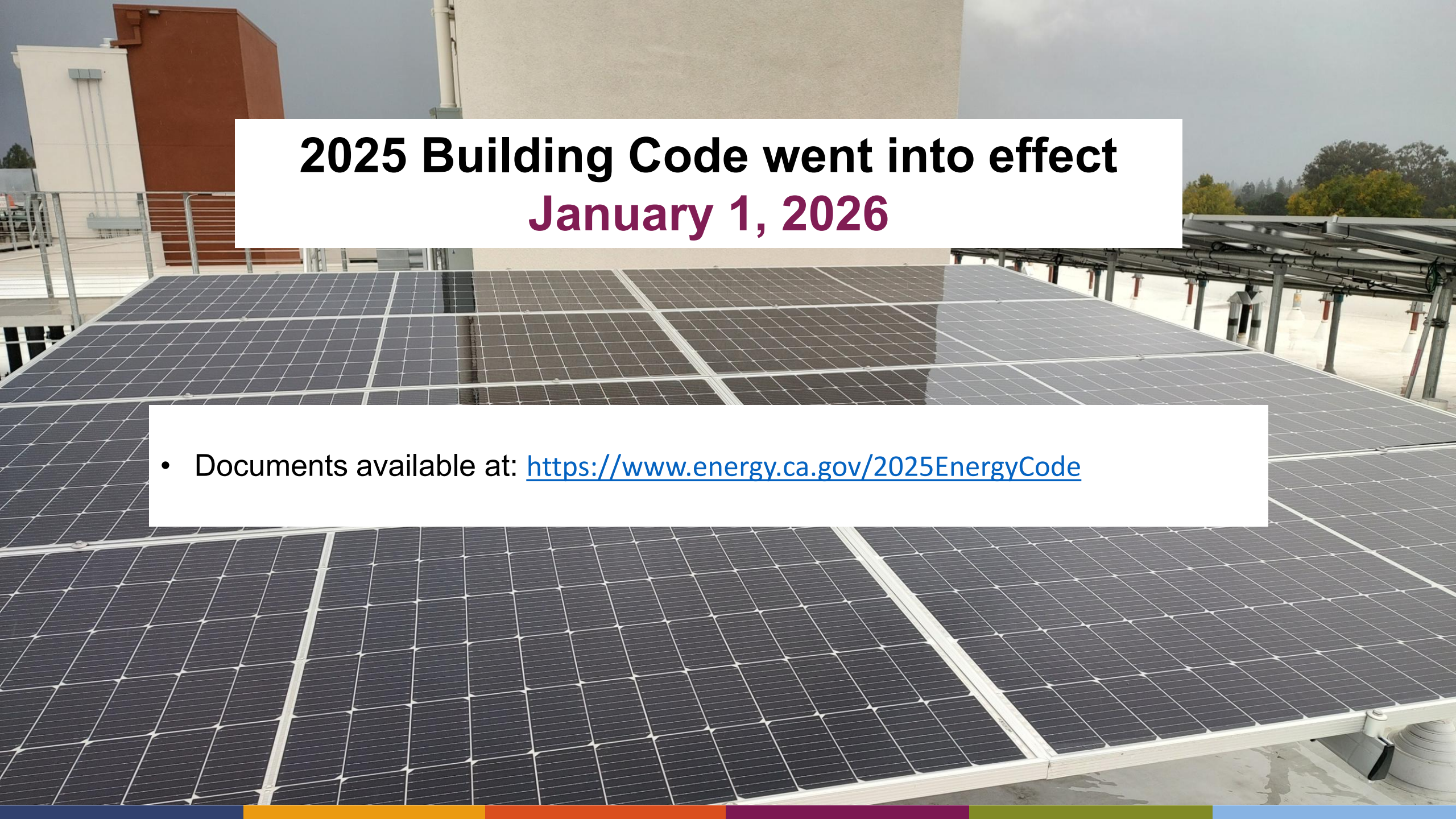
Learning Units:

- 1.50 AIA LUs approved for this course
- 0.15 ICC CEUs approved for this course
- 1.50 CEA CEUs approved for this course

Agenda

1. 2025 Energy Code Overview
2. Single Family Residential –High Level
3. Domestic Water Heating
4. Windows and Attics/Rafter Roof Insulation
5. Battery and Electric Ready
6. Heat Pump for Space Conditioning
7. IAQ Ventilation

2025 Energy Code Overview



2025 Building Code went into effect
January 1, 2026

- Documents available at: https://www.energy.ca.gov/2025EnergyCode

Steady Progress in California

All electric

1978

Title 24 Energy Standard

2008

Energy Efficiency Strategic Plan

2020

PV's for homes; expanded to non-residential in 2023

2030

40% Reduction GHG in Buildings

2045

100% Carbon-Free Electric Generation

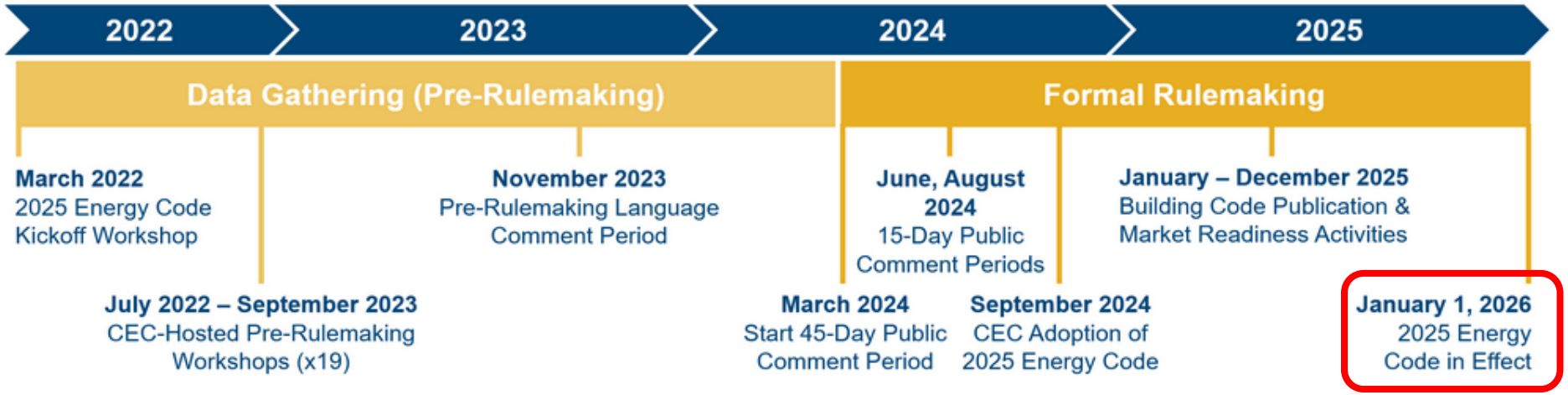
2050

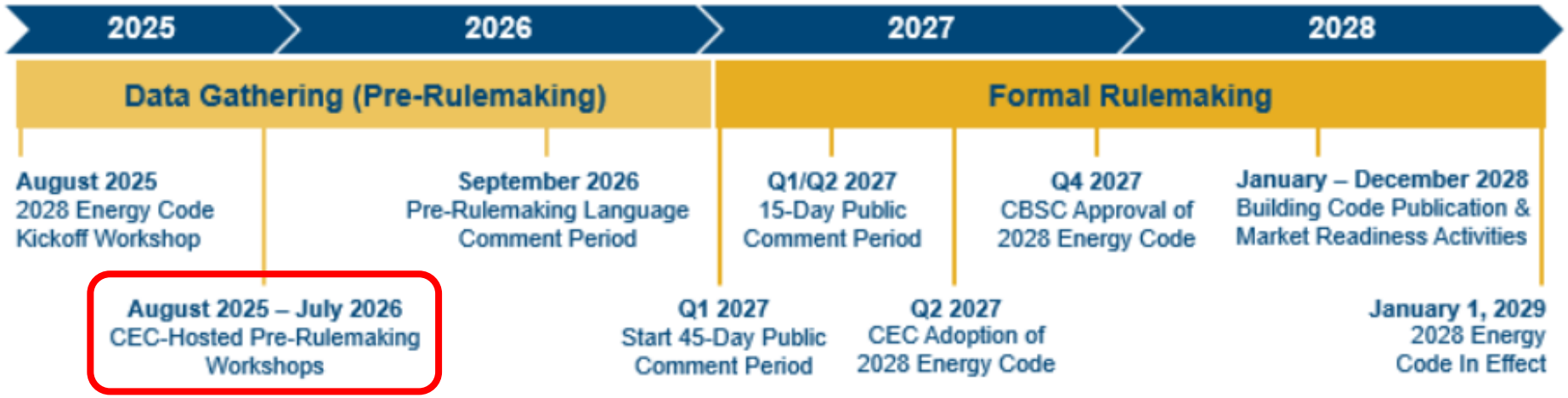
80% Reduction GHG in Buildings

Big Picture Goals for the 2025 Code

- Encourage energy efficient heat pump technology for space and water heating
- Expand PV systems and battery storage standards
- Improve indoor air quality by strengthening ventilation standards
- Save water and save energy by reducing water use in homes and nonresidential buildings
  - References to following Plumbing Code for pipe sizing
  - New Requirements for Chillers and Cooling Towers

Multi-year Adoption Cycle





For more information visit energy.ca.gov

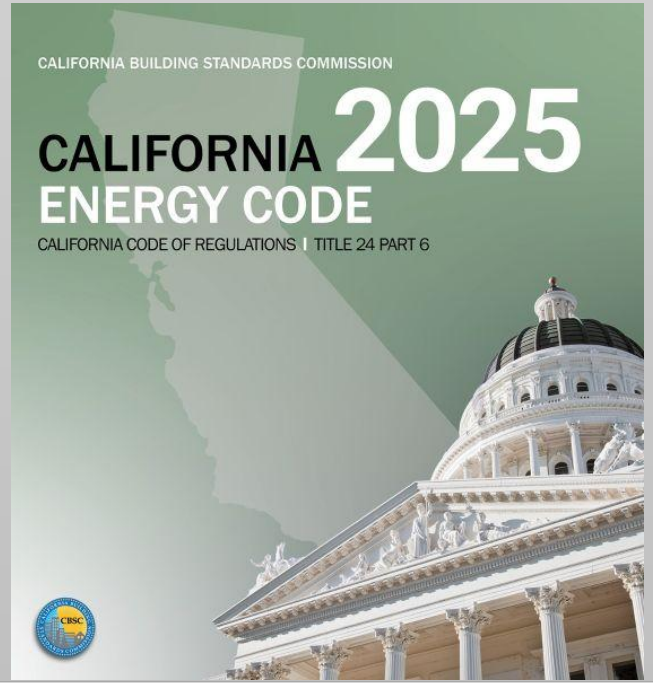
Except…
AB 130: Pause on parts of the 2028 Code Cycle

Residential Standards	**2025 Code** Effective 1/1/2026 (No 2028 Residential Code)		**2031 Code** Effective 1/1/2032
Nonresidential Standards	**2025 Code** Effective 1/1/2026	**2028 Code** Effective 1/1/2029	**2031 Code** Effective 1/1/2032

**2028 Code…? May depend on substance and breadth of allowed changes*

Available in Print on Online

ICC

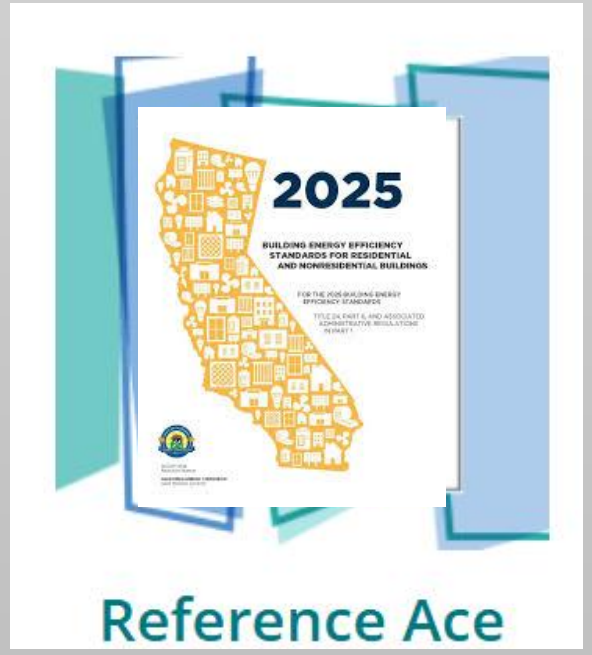


https://codes.iccsafe.org/content/CAEC2025P2

CA Energy Commission

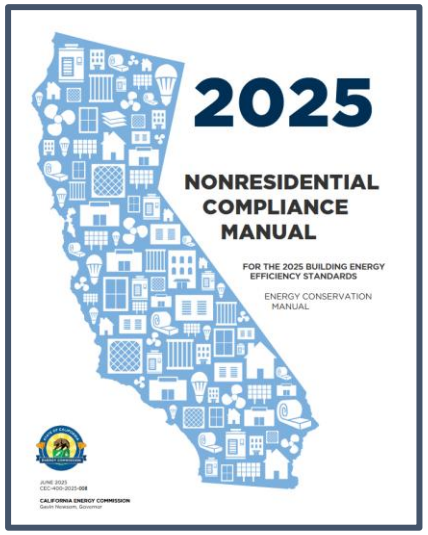
https://www.energy.ca.gov

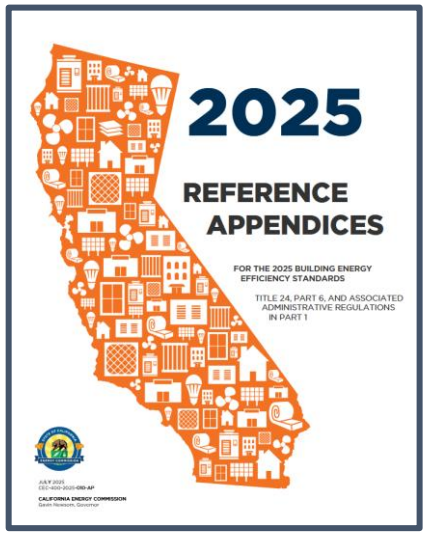
Energy Code Ace

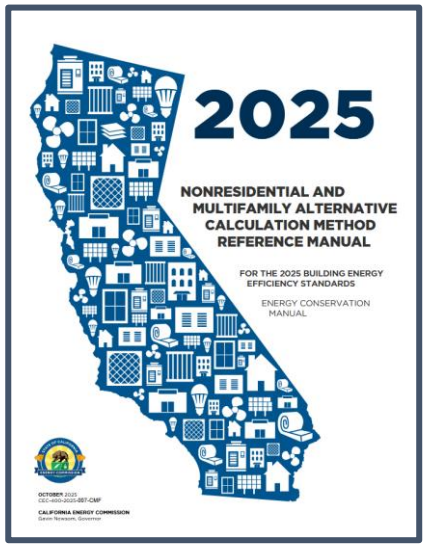


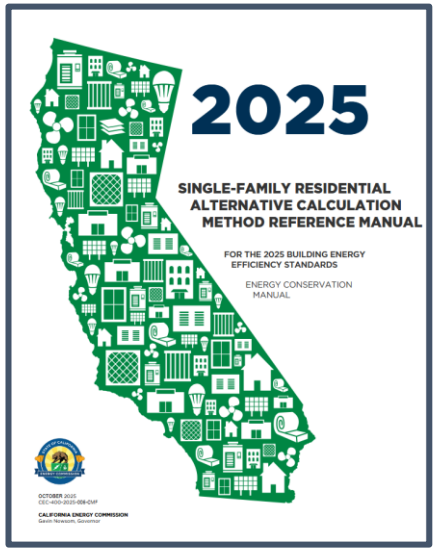
https://energycodeace.com

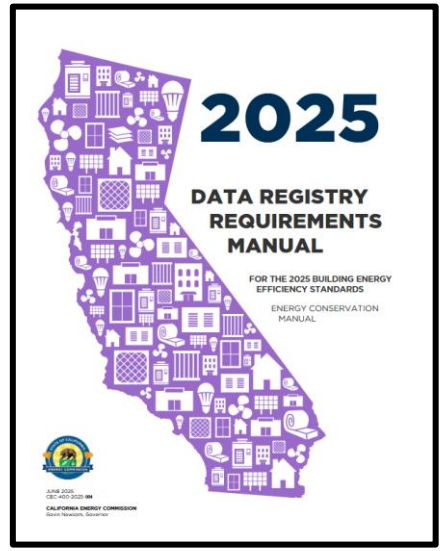
Title 24 Part 6, 2025 Standards and Manuals











https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2025-building-energy-efficiency

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)

Article 1 –Energy Building Regulations — Sec 10-101 – 10-116

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

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

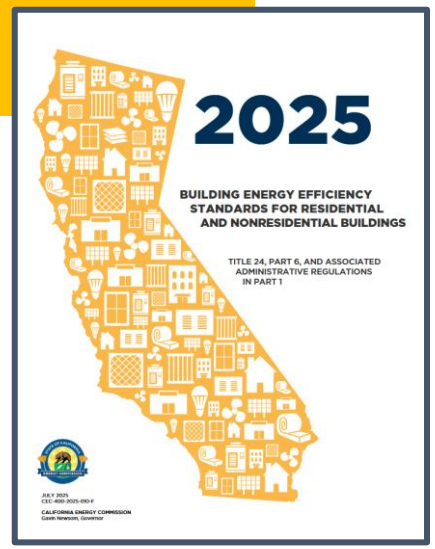
Subchapter 12 – Additions and Alterations — Sec 180.0-180.4

TABLE 100.0-A Application of Standards

TABLE 100.0-A APPLICATION OF STANDARDS (continued)

Occupancies	Application	Mandatory	Prescriptive	Performance	Additions Alterations
Single-Family	General	150.0	150.1(a, c)	150.1(a), 150.1(b)	150.2(a), 150.2(b)
Single-Family	Envelope (conditioned)	110.6, 110.7, 110.8, 150(a), 150.0(b), 150.0(c), 150.0(d), 150.0(e), 150.0(g), 150.0(q)	150.1(a, c)	150.1(a), 150.1(b)	150.2(a), 150.2(b)
Single-Family	HVAC (conditioned)	110.2, 110.5, 150.0(h), 150.0(i), 150.0(j), 150.0(m), 150.0(o)	150.1(a, c)	150.1(a), 150.1(b)	150.2(a), 150.2(b)
Single-Family	Water Heating	110.3, 150.0(j, n)	150.1(a, c)	150.1(a), 150.1(b)	150.2(a), 150.2(b)
Single-Family	Indoor Lighting (conditioned, unconditioned and parking garages)	110.9, 130.0, 150.0(k)	150.1(a, c)	150.1(a), 150.1(b)	150.2(a), 150.2(b)
Single-Family	Outdoor Lighting	110.9, 130.0,150.0(k)	150.1(a, c)	150.1(a), 150.1(b)	150.2(a), 150.2(b)
Single-Family	Pool and Spa Systems	110.4, 150.0(p)	N. A.	N.A.	150.2(a), 150.2(b)
Single-Family	Solar Ready Buildings	110.10	N. A.	N.A.	N.A.
Single-Family	Electric Ready	150.0(s), 150.0(t), 150.0(u), 150.0(v)	N.A.	N.A.	N.A.
Single-Family	Solar PV Systems	N.A.	150.1(c)14	150.1(a), 150.1(b)	N.A.

Single Family Excerpt



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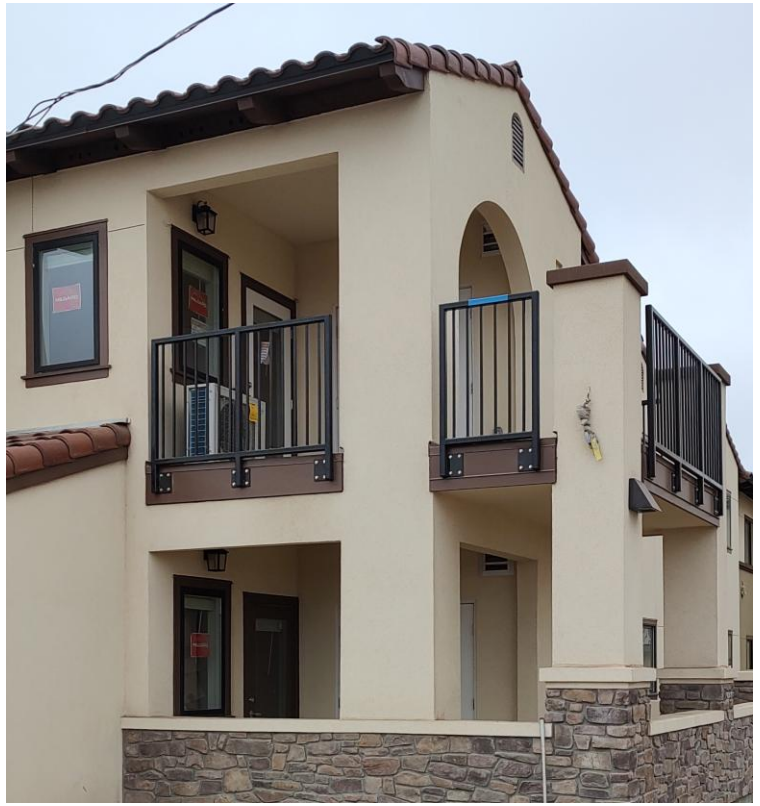
Single Family Residence

High-Level Changes 2025 Code

- EDR Metric is Replaced
- Revised IAQ Ventilation
- Prescriptive requirements expanded
  - Fenestration
  - Heat Pumps
  - ERV/HRV
- Envelope Insulation Increased for some climate zones



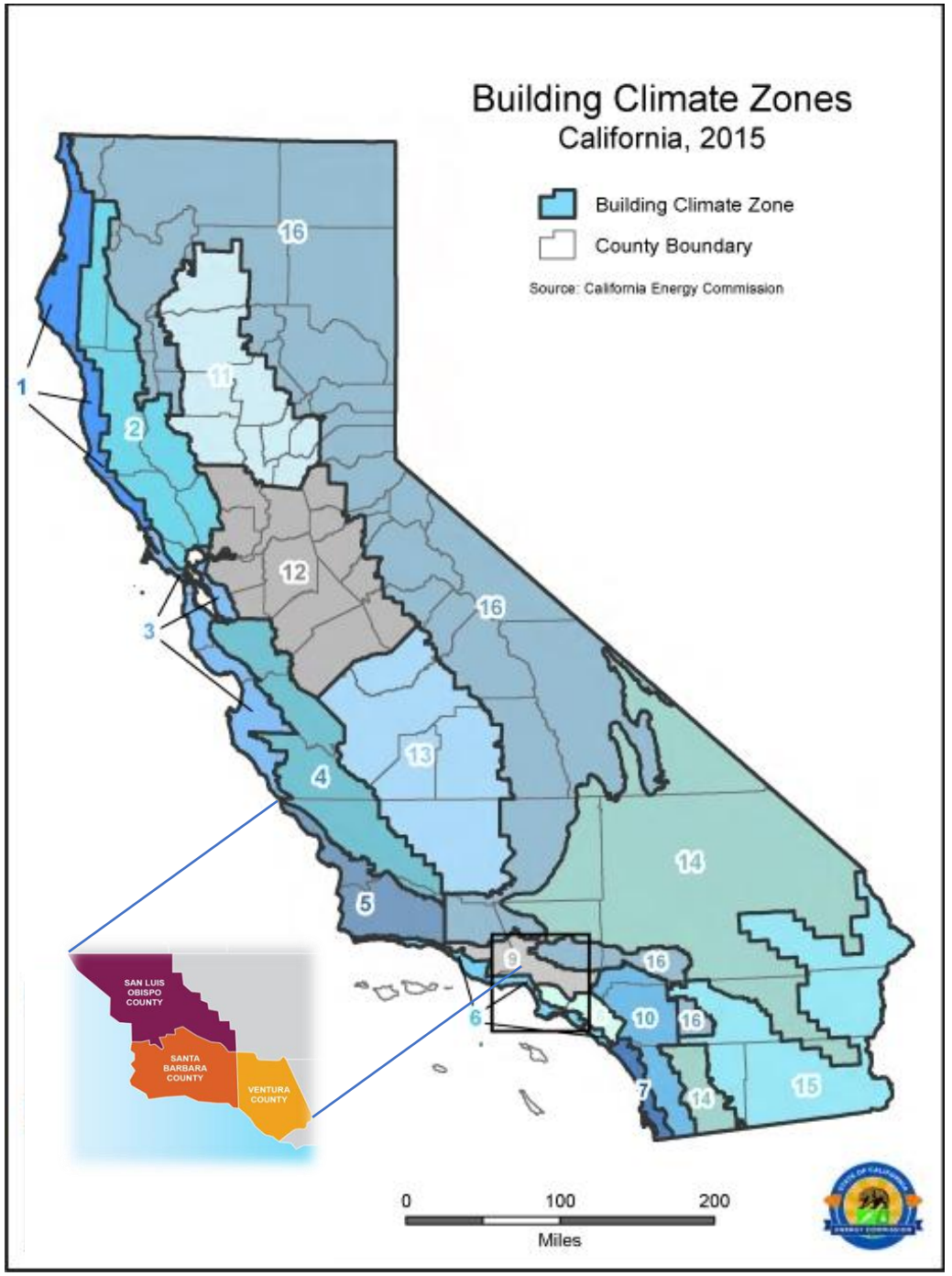
Focus on 3C-REN Tri-County Region

San Luis Obispo, Santa Barbara, and Ventura

CZ's: 4, 5, 6, 9, and 16

Under the Building Energy Efficiency Standards California has 16 defined Climate Zones (CZ)

To find yours search "California EZ Building Climate Zone Search Tool"



The Energy Code –Three Compliance Terms

Mandatory Requirements

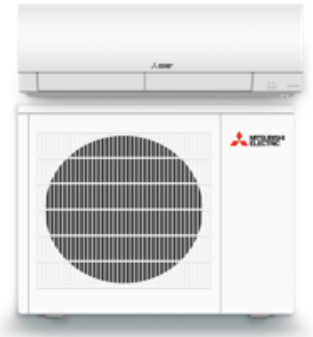
Energy efficiency measures that are applicable to all projects.

Prescriptive Component Package	**Performance Method**
Mandatory Requirements are applicable	Mandatory Requirements are applicable
Follow all the parts of the prescriptive package	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)
Note: used to determine the Standard Design Building	
Essentially a **checklist** approach	**Energy modeling** approach

2025 New Prescriptive Requirements –Applies to CZ 1-16

- **Heat Pump Space Conditioning**; Gas no longer applicable for Prescriptive compliance
- **Heat Pumps Refrigerant Charge Verification**; ECC-Rater to verify –all CZs
- **Fault Indicator Display** (FID) required, if ERV/HRV is installed –ECC field verified.
- **Heat Pump Water Heaters**; Gas water heaters allowed only under the Performance method.

Ducted Heat Pump



Ductless Mini-Split Heat Pump

ERV/HRV

HPWH

New 2025 Performance Method Metrics

- **Long-term system cost (LSC)** -– All electricity, gas or propane used within the modeled buildings shall be converted to LSC. LSC includes the efficiency LSC, which is the sum of LSC energy for space-conditioning, water heating, and mechanical ventilation, and total LSC, which includes efficiency LSC and LSC energy from photovoltaic, energy storage systems, lighting, demand flexibility, and other plug loads.
- **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** – The energy used within the modeled buildings shall be represented as long-run marginal, hourly source energy.
- **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.
- **Peak Cooling –** kWh upper threshold for new construction homes in Climate Zones (CZ) 4 and 8-15.
- **Peak Cooling** allowable is 120% of the Standard case peak cooling. Peak cooling energy is the total annual mechanical cooling site energy, in kWh, that occurs at peak hours between 4 pm and 9 pm for July to November.

Single Family Metrics for Performance Method

Code Cycle	New Construction (Includes Stand-Alone ADU's)				Additions &/or Alterations
2022	EDRe	EDRt	EDRs	-	TDV
2025	LSCe	LSCt	Source	Peak Cooling	LSCe

TDV = Time Dependent Valuation (kbtu/ft2-yr)
EDR*e* = Energy Design Rating -*efficiency* (Score 0-100)
EDR*t* = Energy Design Rating -*total* (Score 0-100)
EDR*s* = Source Energy Design Rating (kbtu/ft2-yr as a proxy for carbon)

LSC*e* = Long-term System Cost -*efficiency* ($/ft2)
LSC*t* = Long-term System Cost -*total* ($/ft2)
Source = Total Annual Source Energy
Peak Cooling = 120% of Baseline (kWh). Applies to CZ 4 and 8-15.

Example –Performance Method Results (CZ 1-3, 5-7, 16)

✓ 1 CA Residential 2025, Vers. 2 (CA Res 2025.bin)

Compliance Summary | Energy Use | Emissions | Project Details

	Standard Design	Proposed Design	Compliance Margins	
Long-term System Cost[1]				
Efficiency[2] ($/ft²-yr)	64.22	61.38	2.84	**Pass**
Total[3] ($/ft²-yr)	162.48	159.33	3.15	**Pass**
Source Energy				
Total[3] (kBtu/ft²-yr)	63.38	38.63	24.75	**Pass**
Peak Cooling**				
Electricity (kWh)	23	13	n/a	

Result*: COMPLIES

[1] Long-term System Cost (LSC) is a 30-year present value cost to California's energy system. LSC is not a predicted utility bill.
[2] Efficiency measures include energy efficiency improvements such as better building envelope and more efficient mechanical equipment.
[3] Total includes the sum of efficiency measures, solar photovoltaic (PV) measures and battery storage measures.
* Building complies when the Proposed Design is equal to or less than the Standard Design in all compliance categories.
** Peak cooling target represents 120% of the standard design building peak cooling energy use.

When all three –LSC Efficiency, LSC Total, and Source Total –have a positive compliance margin value, the project complies.

Note: Peak Cooling is applicable in CZ 4 and 8-15.

Example –Performance Method Results (CZ 4, 8-15)

✓ 1 CA Residential 2025, Vers. 2 (CA Res 2025.bin)

Compliance Summary | Energy Use | Emissions | Project Details

	Standard Design	Proposed Design	Compliance Margins	
Long-term System Cost[1]				
Efficiency[2] ($/ft²-yr)	73.32	71.22	2.10	**Pass**
Total[3] ($/ft²-yr)	171.04	168.79	2.25	**Pass**
Source Energy				
Total[3] (kBtu/ft²-yr)	64.21	40.63	23.58	**Pass**
Peak Cooling**				
Electricity (kWh)	154	131	23	**Pass**

Result*: COMPLIES

[1] Long-term System Cost (LSC) is a 30-year present value cost to California's energy system. LSC is not a predicted utility bill.
[2] Efficiency measures include energy efficiency improvements such as better building envelope and more efficient mechanical equipment.
[3] Total includes the sum of efficiency measures, solar photovoltaic (PV) measures and battery storage measures.
* Building complies when the Proposed Design is equal to or less than the Standard Design in all compliance categories.
** Peak cooling target represents 120% of the standard design building peak cooling energy use.

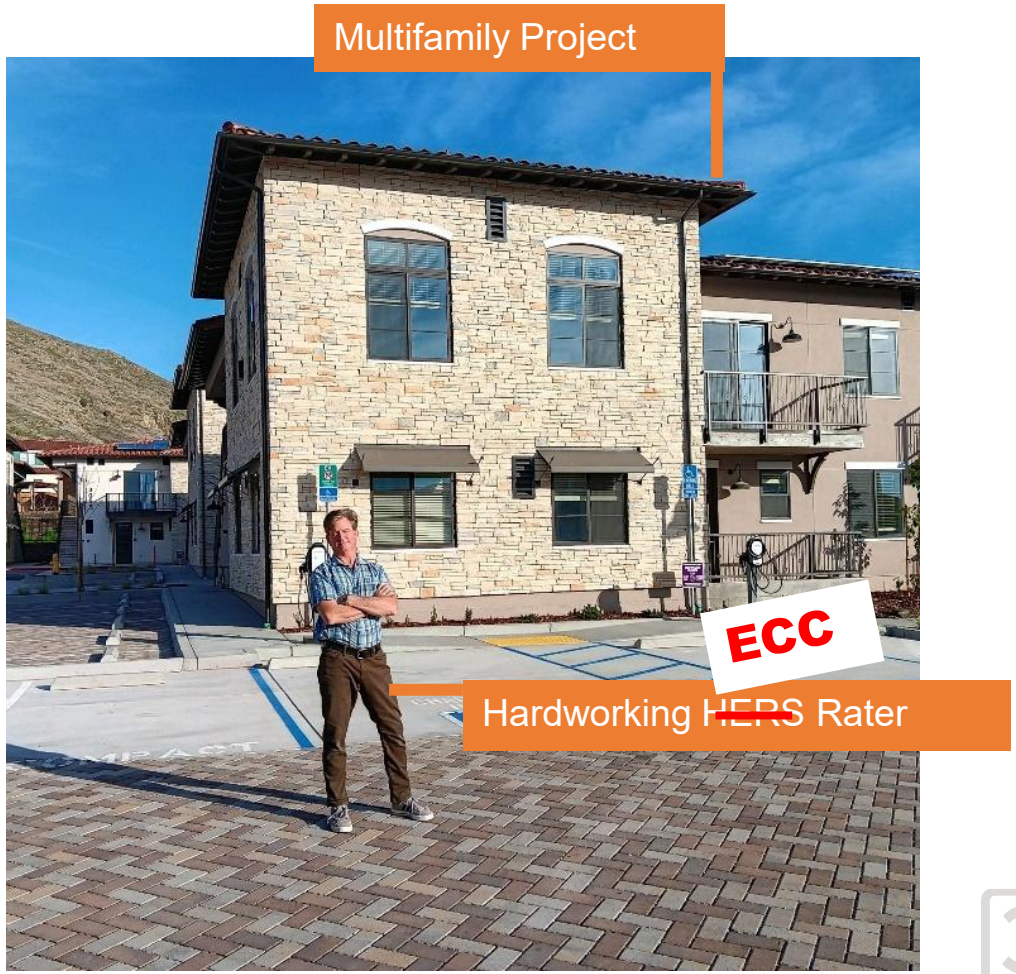
When all metrics –LSC Efficiency, LSC Total, Source Total, and Peak Cooling –have a positive compliance margin value, the project complies.

Note: Peak Cooling is applicable in CZ 4 and 8-15.

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: CF-2R and CF-3R, 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.

Service/Domestic Hot Water

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

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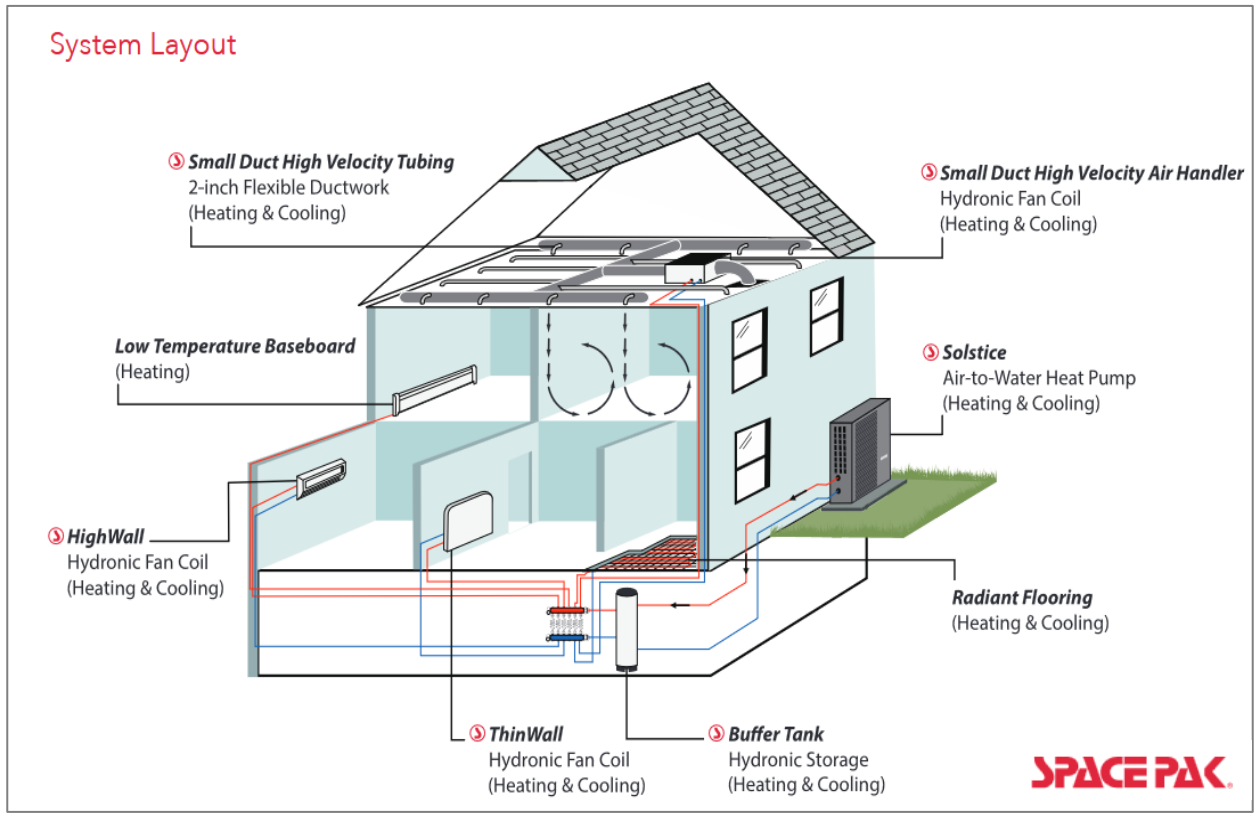
Air-to-Water Heat Pump (AWHP)

Added Definition:

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, and/or and domestic hot water loads, or both.

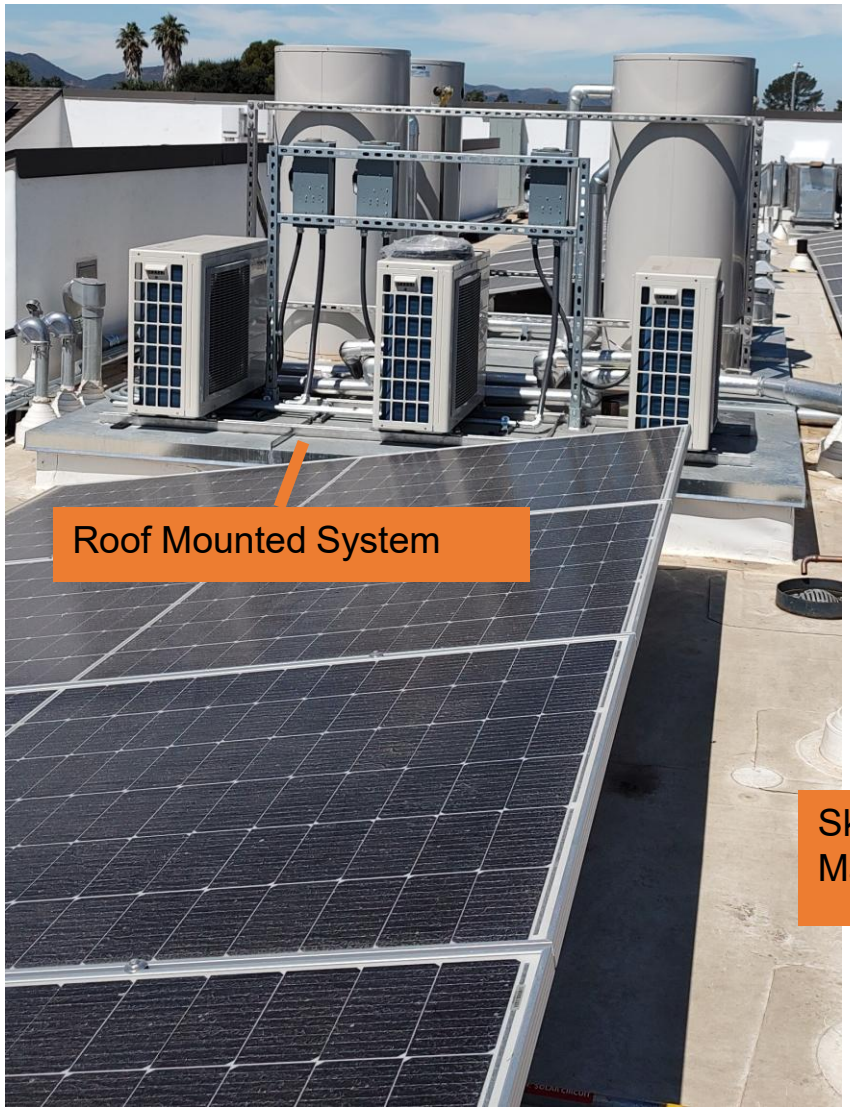


Solstice® Inverter Monobloc

Air-to-Water Heat Pump

- Hot or Cold water circulates within the house –not refrigerant
- Uses a ducted system to deliver cooling
- Uses Mitsubishi Inverter for high performance

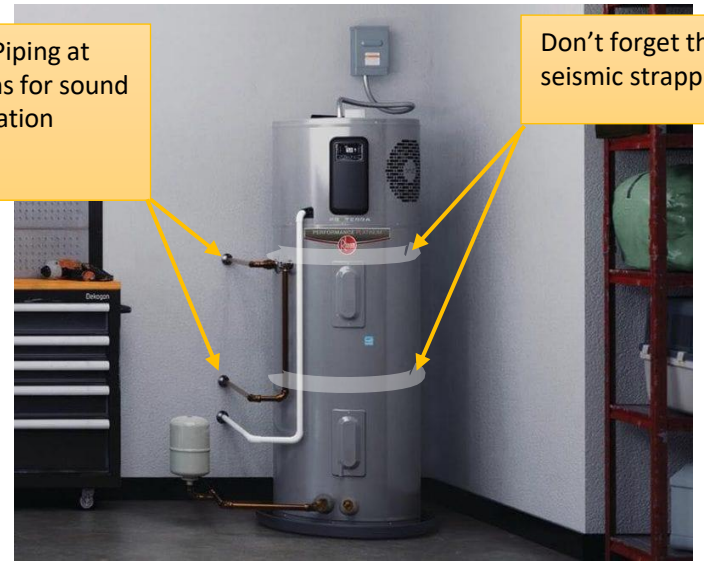
Example of Split-Hydronic Heat Pump Water Heater System



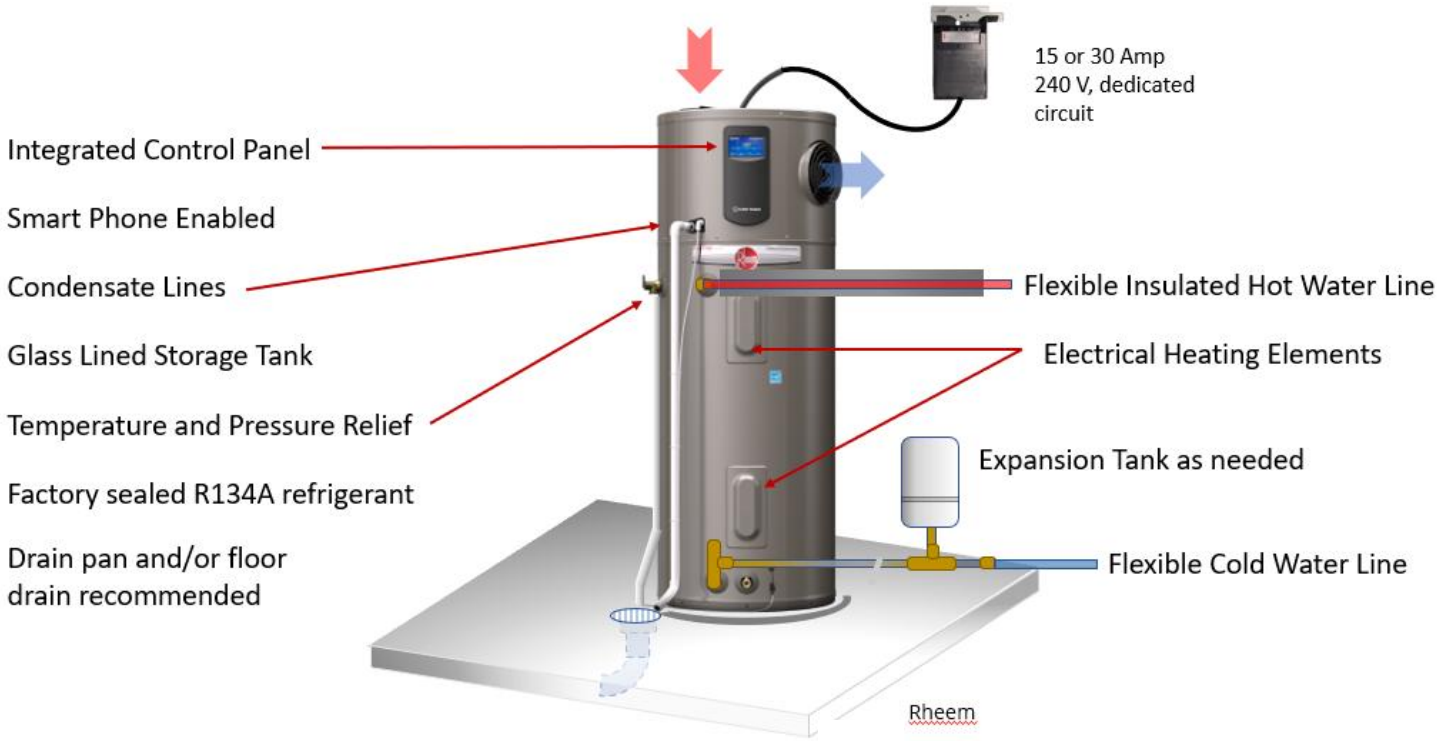
Project: Harry's House – Santa Barbara County

Integrated HPWH

- **Integrated HPWH tanks taller than standard gas or electric units**
- **Sound Level is typically around 50 db**
- **Condensate Drainage needs to be addressed**
- **Ventilation for HP needs to be designed: Older models need 700 – 1000 cubic feet volume, or ducted vent kit, newer models only need 450 cu ft**
- **Operating temperature starts around 45 deg F, some models 37 deg F**



Rheem marketing



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)

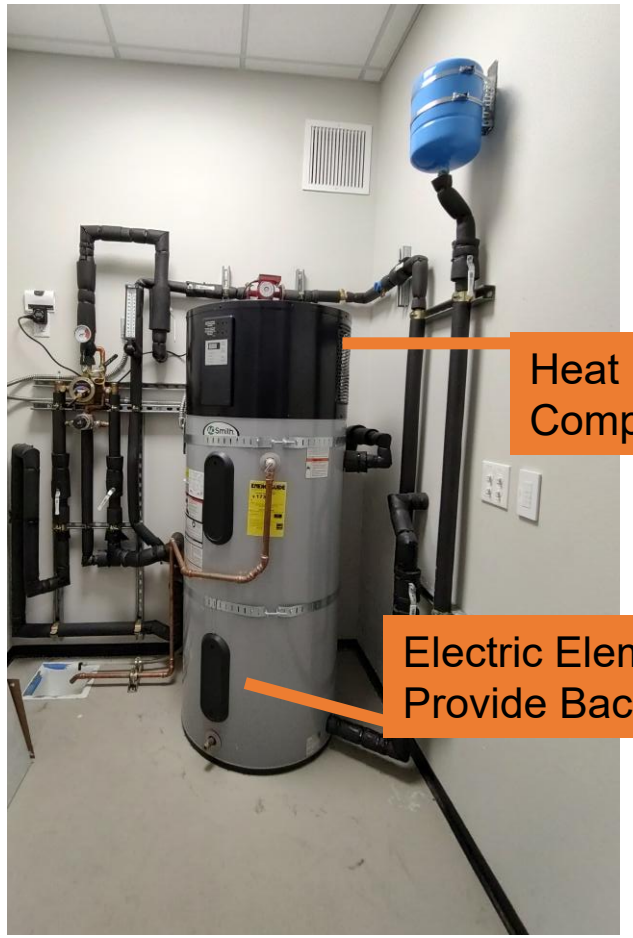
New Mandatory Requirements for HPWH

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

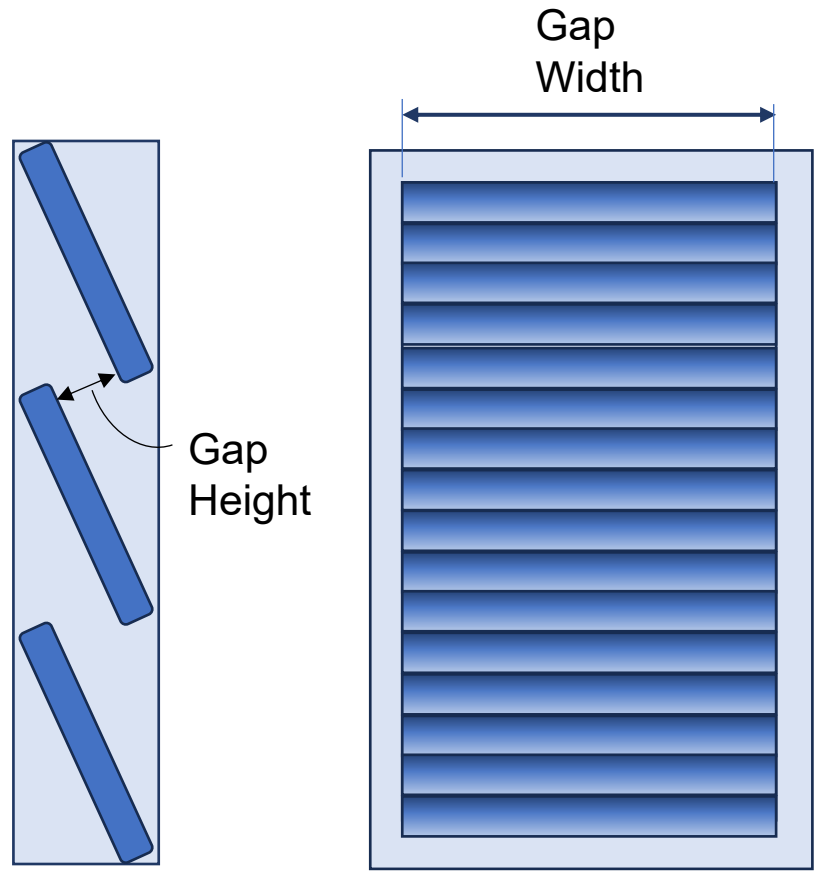
ii. Permanent openings shall consist of a single layer of fixed flat slat louvers or grilles, with a total minimum **Net Free Area (NFA)** the larger of 125 square inches plus 25 square inches per kBtu per hour of compressor capacity, or the minimum provided by the manufacturer for this method. The permanent 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

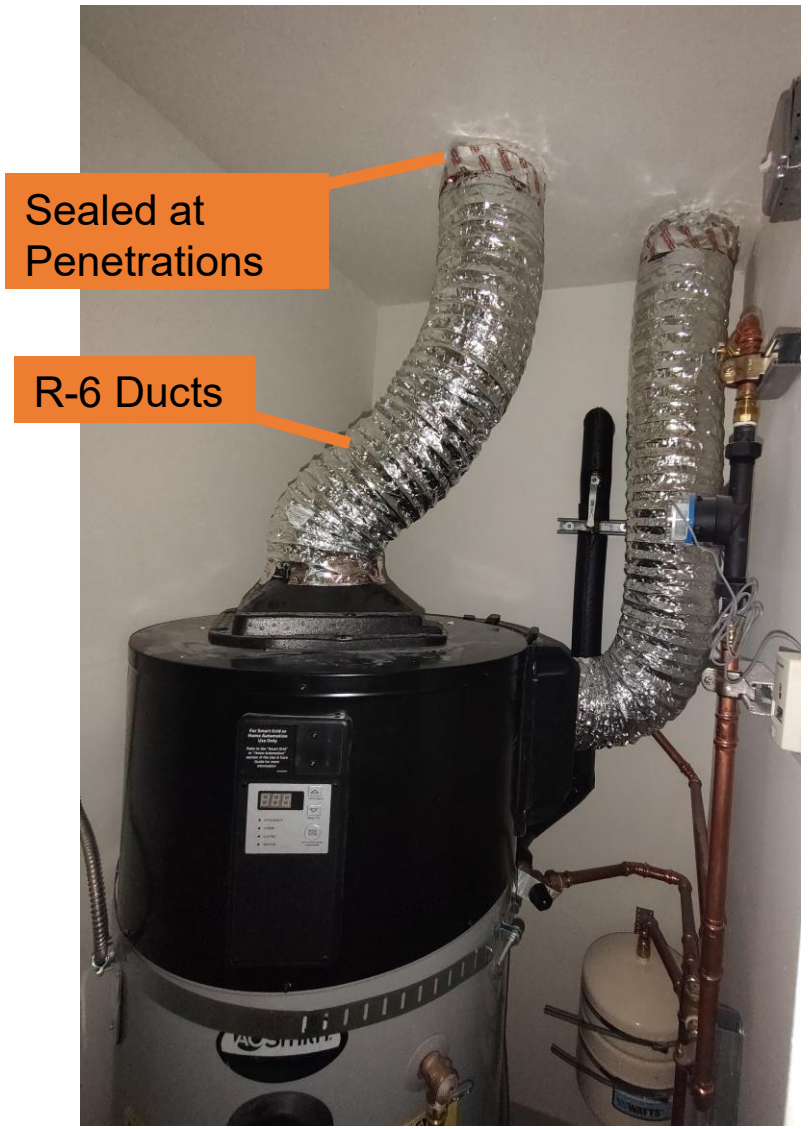
   ii. All duct connections and building penetrations shall be sealed; and

   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.



Water Heaters –New Construction (all Climate Zones)



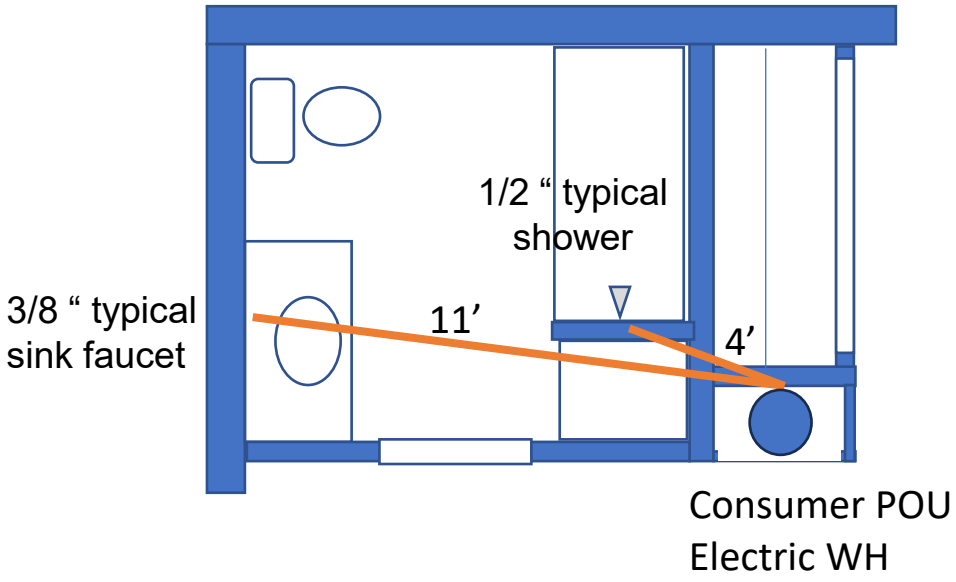
SanCO2

- 240V heat pump water heater
- Solar thermal with electric back-up
- For new dwelling unit with 1 bedroom or less, a 120V HPWH may be installed in place of a 240V HPWH.
- For new dwelling units that are 500 sq ft or less, an electric water heater with ***point of use distribution (POU)*** as specified in RA4.4.5 is allowable


Instantaneous POU (12 kW Rated Input)


Consumer POU Electric
(20 gal Storage Tank)

Point of Use (POU) – Required when Exemption is taken.



Plan check Item: Show the horizontal measurements and piping size on plans.
ECC Provider/Rater Installation: Water heater installation CF2R-PLB02 - “Consumer POU Electric”

POU - Point of Use Distribution
Reference Appendices –RA4.4.5

Table 4.4.5

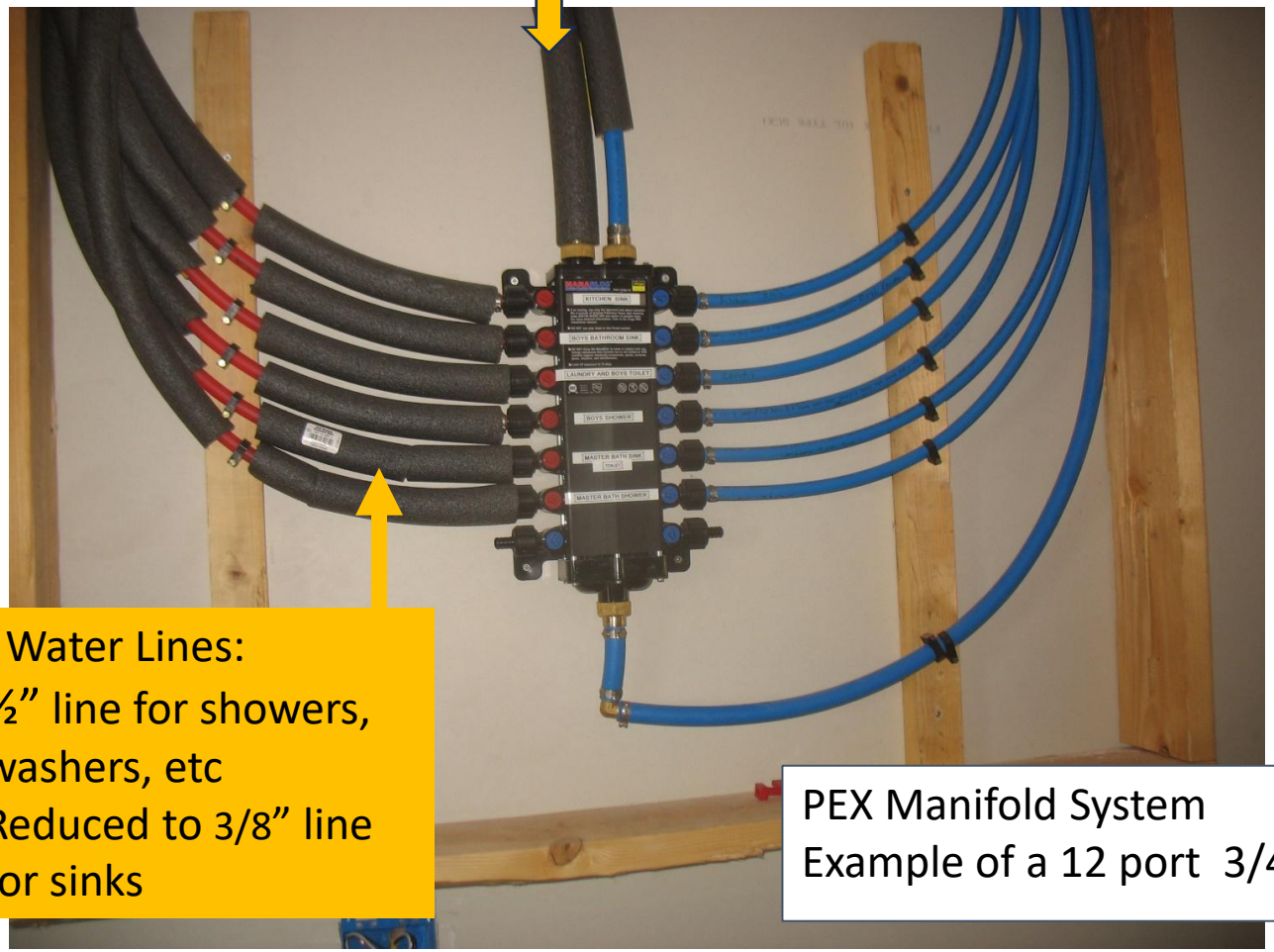
Size Nominal (Inch)	Length of Pipe (feet)
3/8”	15
1/2”	10
3/4”	5

Line size vs Length for each run.

- Take most direct path with truck-branch line.
- If two pipe sizes are used in a single run, half the length of pipe shall be considered for each pipe size.

Example of a Manifold System that can be use for POU, Parallel Plumbing and Compact Plumbing Distribution

¾” Hot Water Line Directly from Water Heater



Hot Water Lines:

- ½” line for showers, washers, etc
- Reduced to 3/8” line for sinks

PEX Manifold System
Example of a 12 port 3/4 x 1/2

¾” lines connection typical

Insulation for Piping and Tanks

- **All hot water piping** shall be insulated per 609.12 (previously 609.11) of the CA Plumbing Code, i.e. Title 24, Part 5.

- **Exceptions**: Piping surrounded with a
  - 1” min. of wall insulation
  - 2” min. of crawl space insulation
  - 4” min. of attic insulation

Reference: Section 609.12 (previously 609.11) of the CA Plumbing Code

609.12 Pipe Insulation. Insulation of domestic hot water piping shall be in accordance with Section 609.12.1 and Section 609.12.2.

609.12.1 Insulation Requirements. Domestic hot water piping shall be insulated.

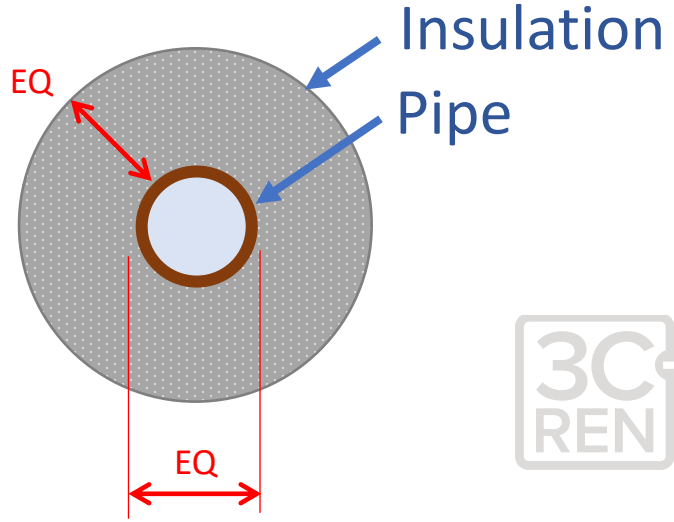
609.12.2 Pipe Insulation Wall Thickness. Hot water pipe insulation shall have a minimum wall thickness of not less than the diameter of the pipe for a pipe up to 2 inches (50 mm) in diameter. Insulation wall thickness shall be not less than 2 inches (51 mm) for a pipe of 2 inches (50 mm) or more in diameter.

Exceptions:

(1) Piping that penetrates framing members shall not be required to have pipe insulation for the distance of the framing penetration.

(2) Hot water piping between the fixture control valve or supply stop and the fixture or appliance shall not be required to be insulated.

Pipe insulation thickness shall be at least as thick as the pipe diameter.



Envelope: Roof/Attic, Walls, and Windows

Mandatory Insulation at Roof and Walls

Roof Assemblies

Climate Zones (CZ) 4 and 8-16:

- Weighted average U-factor U-0.184 at roof deck only
- Examples: R-19 under roof-deck, or R-5 exterior continuous insulation.

All Climate Zones :

- Weighted average U-factor U-0.043 at ceilings and rafter roof assemblies
- Example: R-22 at ceiling of a vented attic

Wall Assemblies

2x4 Wood Framing:

- U-factor U-0.095
- R-15 Cavity (16” o.c.)

2x6 Wood Framing:

- Max. U-factor U-0.069
- R-21 Cavity (16” o.c.)

Opaque Non-Framed:

- Max. U-factor U-0.102
- [Roughly equal to R-10]

New Construction– Vented Attics and Cathedral Roof

NR = Not Required
REQ = Required

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
Ducts in the Attic: Option B[13] Below Roof Deck Insulation[1,2] (with Air Space)	NR	NR	NR	R-19	NR	NR	NR	R-19	R-19	R-19	R-19	R-19	R-19	R-19	R-19	R-19
Ducts in the Attic: Option B[13] Ceiling Insulation	R-38	R-38	R-30	R-38	R-30	R-30	R-30	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38
Ducts in the Attic: Option B[13] Radiant Barrier	NR	REQ	REQ	NR	REQ	REQ	REQ	NR	NR	NR	NR	NR	NR	NR	NR	NR
Ducts and Air-handler in the Conditioned Space: Option C[14] Ceiling Insulation for Vented Attics	R-38	R-30	R-30	R-30	R-30	R-30	R-30	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38
Ducts and Air-handler in the Conditioned Space: Option C[14] Radiant Barrier for Vented Attics	NR	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	REQ	NR
Ducts and Air-handler in the Conditioned Space: Option C Roof Deck Insulation for Cathedral Ceilings[1,4]	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38

New Construction –Option B, Vented Attic - Ducts in the Attic

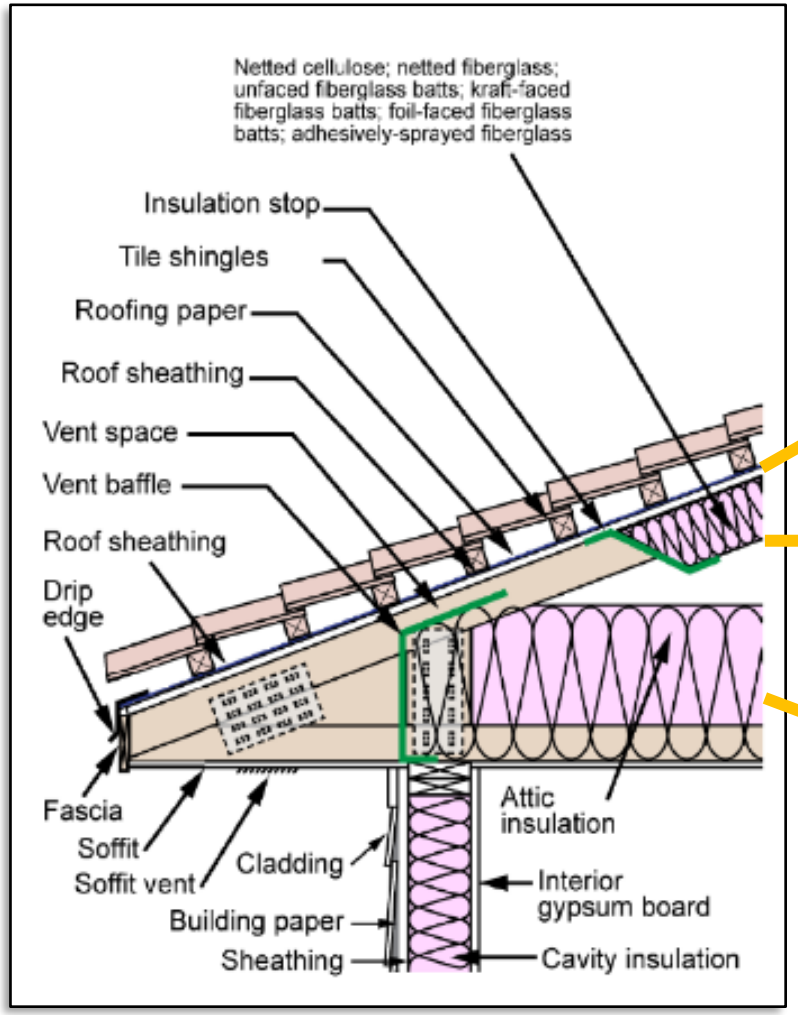


Image credit: CEC

Note: Applies to Climate Zones 4 and 8-16

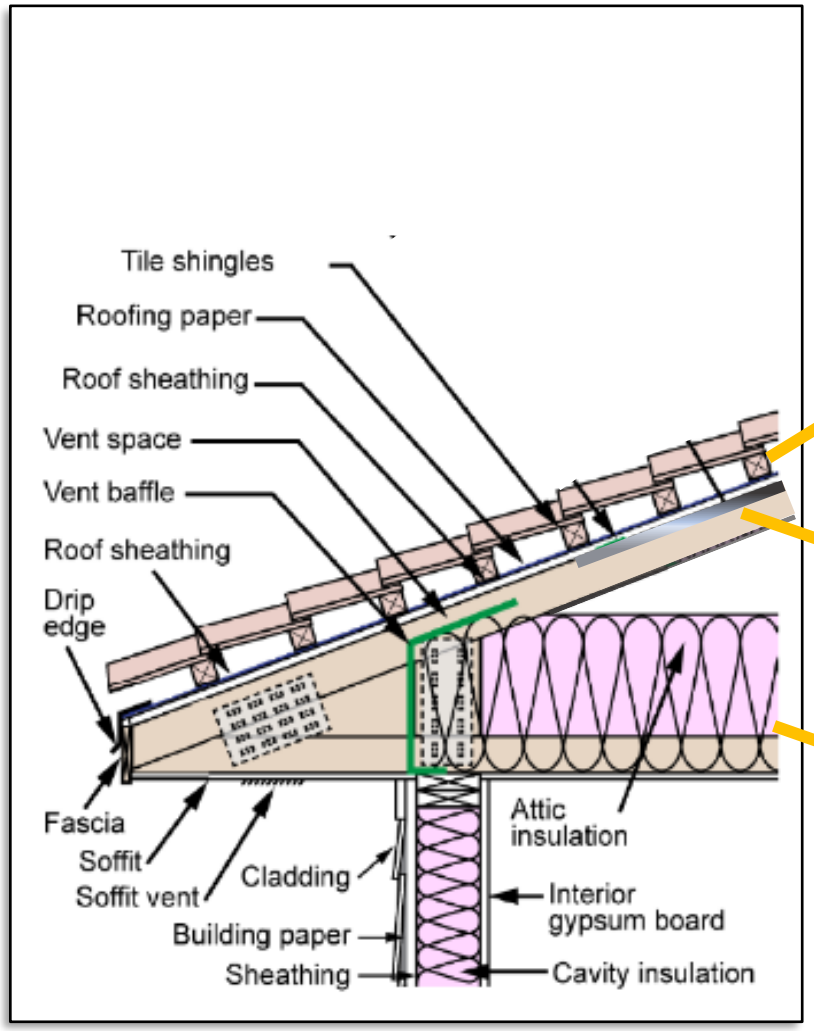
Footnote 1: Air-space between the *Roofing* and the *Roof-Deck* (aka Roof Sheathing)

R-19 Prescriptive Below Roof-Deck Insulation

R-38 Prescriptive Ceiling Insulation

This is the Baseline for the Performance Method

New Construction –Option B, Vented Attic - Ducts in the Attic



Modified CEC Image

Note: Applies to Climate Zones (CZ) 1-3 and 5-7

Footnote 1: Air-space between the *Roofing* and the *Roof-Deck* (aka Sheathing)

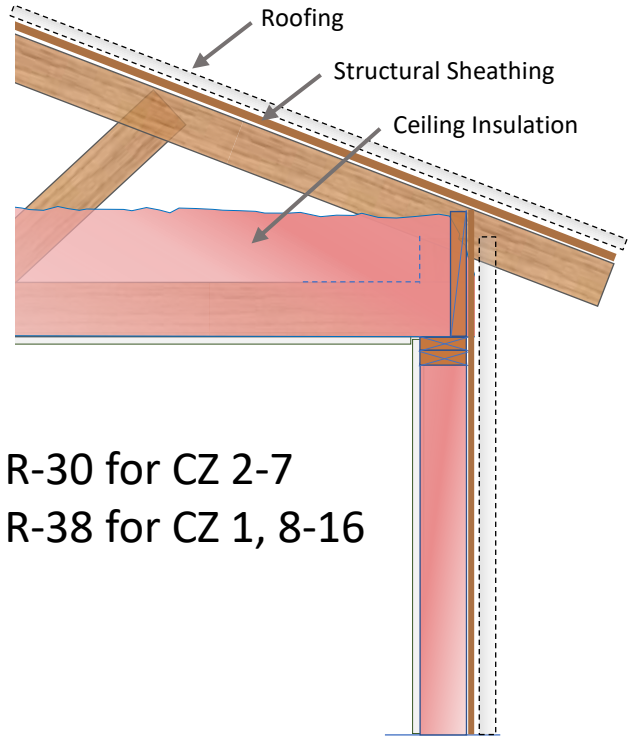
Radiant Barrier, per CZ

R-30 or R-38, per CZ Prescriptive Ceiling Insulation

This is the Baseline for the Performance Method

2025 New Construction –Option C, Vented Attic or Rafter Roof - Ducts in Conditioned Space

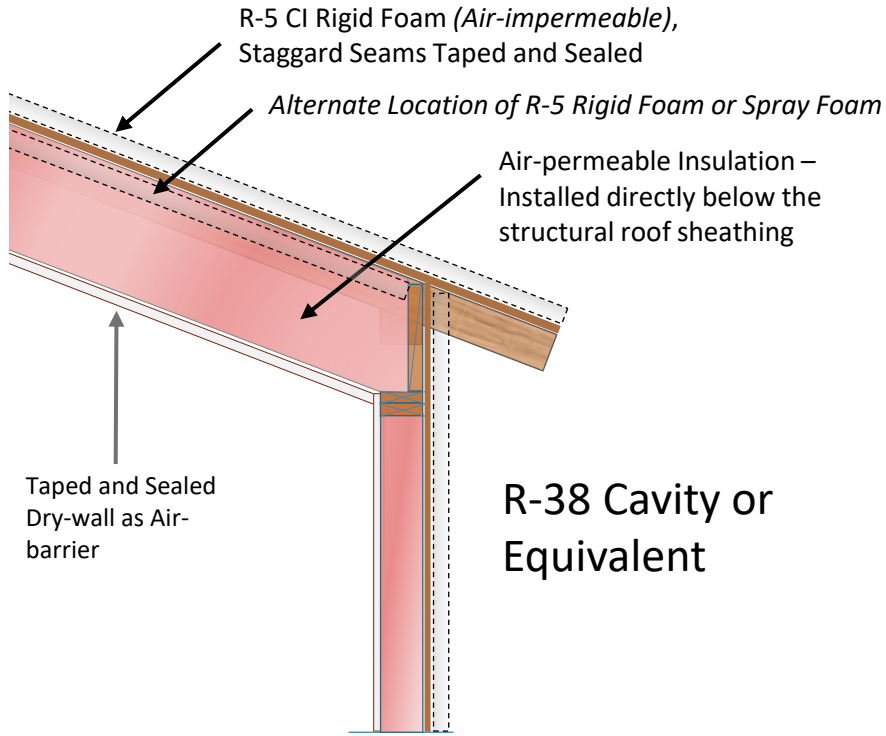
2025 Update – Climate Zones (CZ) 8, 9, and 10 got an upgrade to R-38



R-30 for CZ 2-7
R-38 for CZ 1, 8-16

Vented Attic with Ceiling Insulation (Option C)

2025 Update –New Prescriptive Option: All Climate Zones are R-38



R-38 Cavity or Equivalent

Unvented Cathedral / Rafter Roof

Performance Method

Vented Attic with above Roof-Deck Continuous Insulation (CI)

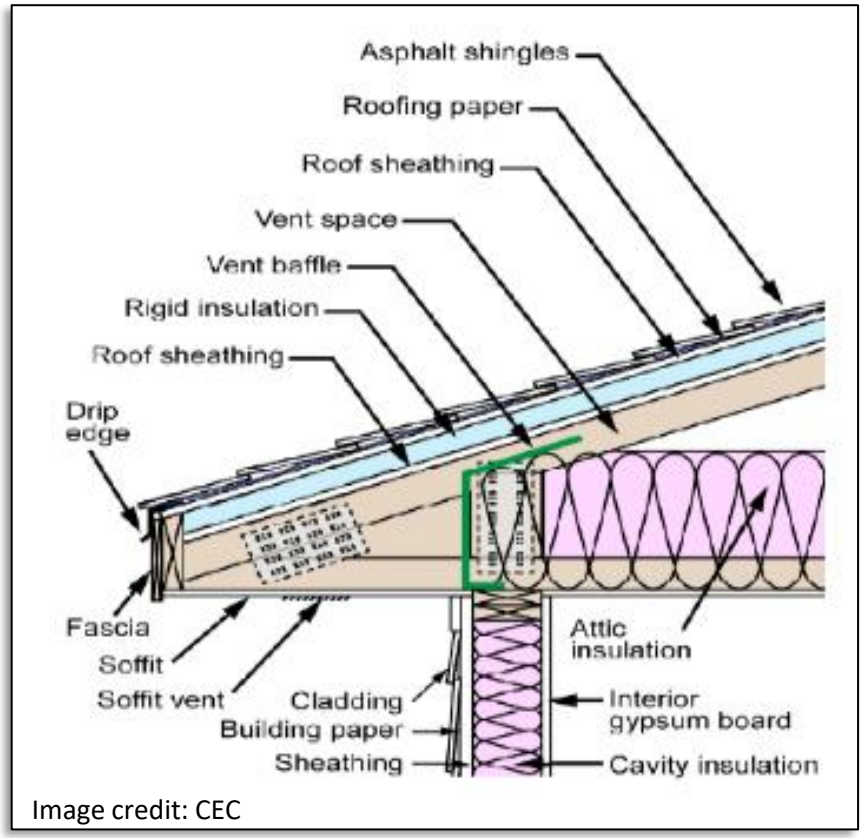
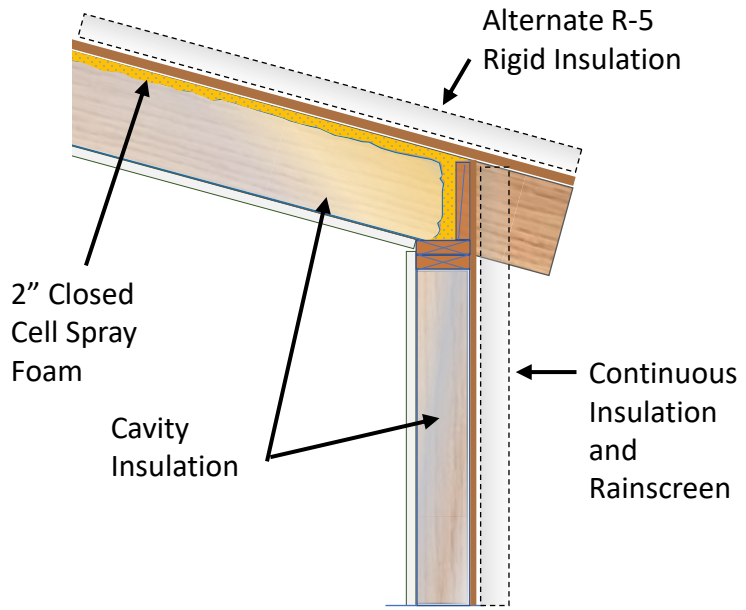


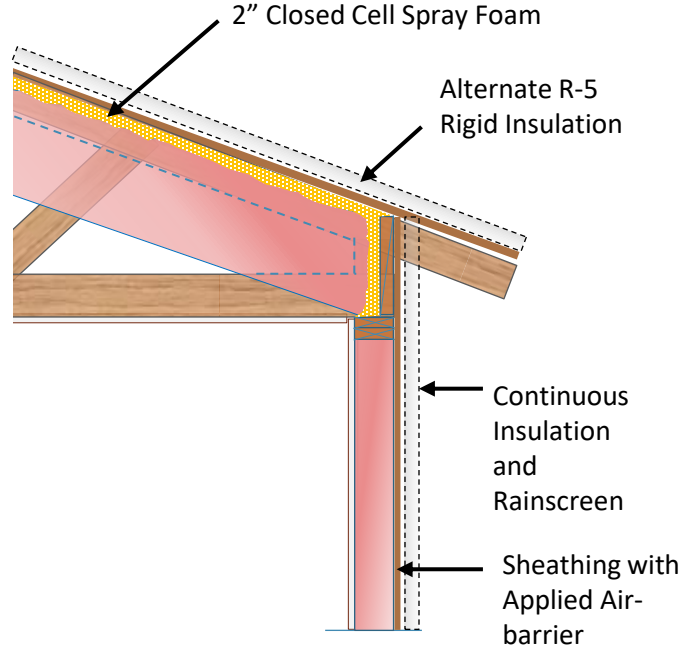
Image credit: CEC

Rafter Roof Assemblies – Vented or Unvented



Unvented Rafter Roof with a Continuous Air and Thermal Boundary

Un-Vented Attics



Unvented Attic with a Continuous Air and Thermal Boundary

Performance Method –Key Attributes (Inputs)

Vented or Unvented Attic

Re: Insulation Depth at Roof Deck

Location and Total R-value, with or without Framing

General | JA4 | Residential T24 Performance | Layers

Attic

☑ Unventilated

Truss Heel Height: 9.5 inches

☑ Insulation covers framing at underside of roof deck

This tab is used to edit the attributes of the assembly used for Residential Title 24 Performance calculations in the software.

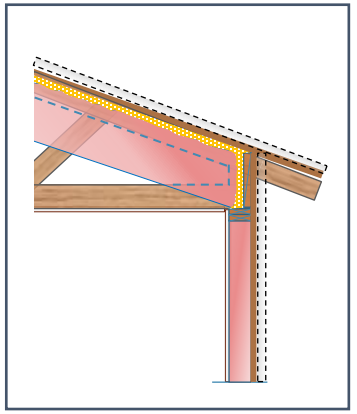
Insulation

Location	Insulation	Framing	Thickness
Ceiling:	- no insulation -	2x4 @ 24 in. O.C.	
Above Roof Deck:	0 R-value	None	0 inches
Below Roof Deck:	30 R-value	Wood	3.5 inches

Other

Exterior Wall Finish: Stucco

☐ Non standard spray foam insulation requiring QII Inspection



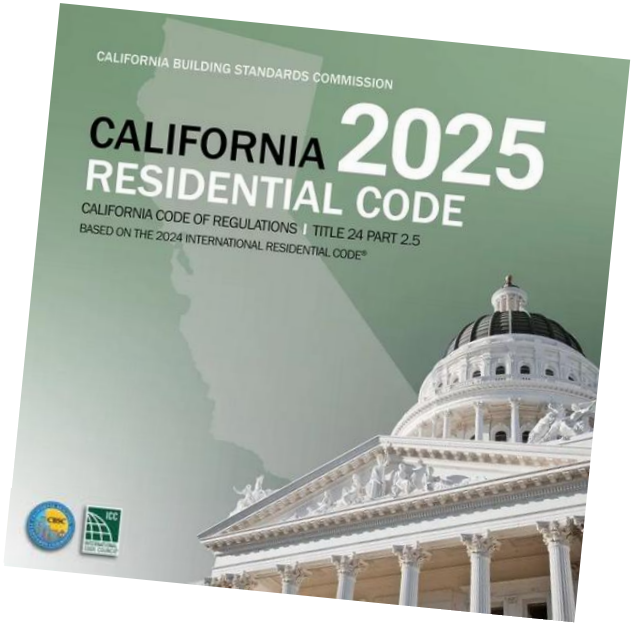
Unvented Attic with a Continuous Air and Thermal Boundary

Note: The Energy Code does not specifically address condensation potential , nor the amount and area of attic ventilation or vapor diffusion, nor insulation type(s)… those regulations are in the Residential Code

California Residential Code –Title 24, Part 2.5

R806.5 Unvented Attic and Unvented Enclosed Rafter Assemblies

- Section R806.5 –Primary intention is to mitigate against condensation at the roof structural sheathing.
- ‘Spells out’ the requirements for use of air-permeable and air-impermeable insulations.
- List the requirements for unvented attics that use *only* air-permeable insulation for IECC Climate Zones 1,2, & 3
    - Vapor diffusion ports (20 perm min rating), and shall serve as an air barrier between the attic and the exterior of the building
    - Where only air-permeable insulation installed directly below the roof structural sheathing, an air supply flow rate of 50 cfm per 1,000 sf of ceiling area must be provided

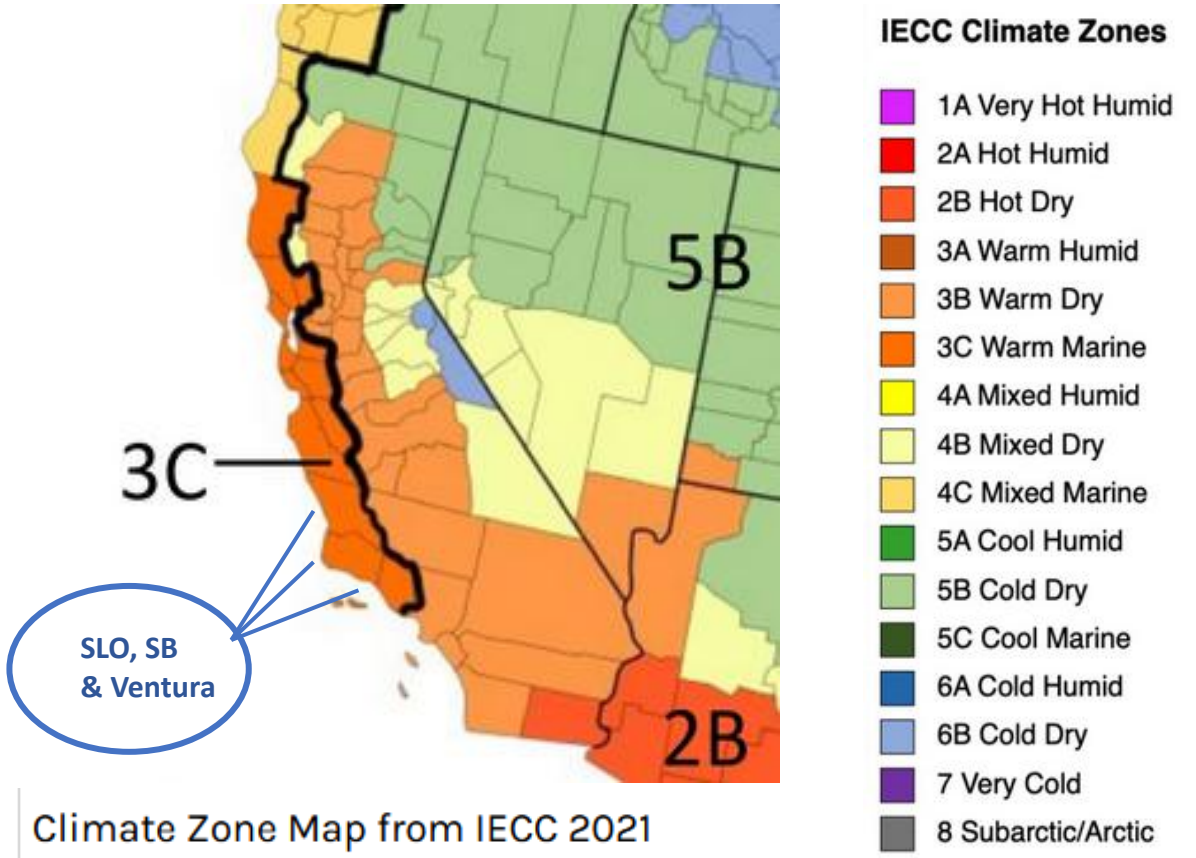


Part 2.5 is Based on the International Energy Conservation Code (IECC)

TABLE R806.5—INSULATION FOR CONDENSATION CONTROL

CLIMATE ZONE	MINIMUM RIGID BOARD OR AIR-IMPERMEABLE INSULATION *R*-VALUE[a, b]
2B and 3B tile roof only	0 (none required)
1, 2A, 2B, 3A, 3B, 3C	R-5
4C	R-10
4A, 4B	R-15
5	R-20
6	R-25
7	R-30
8	R-35

a. Contributes to but does not supersede the requirements in *the California Energy Code*.
b. Alternatively, sufficient continuous insulation shall be installed directly above the structural roof sheathing to maintain the monthly average temperature of the underside of the structural roof sheathing above 45°F (7°C). For calculation purposes, an interior air temperature of 68°F (20°C) is assumed and the exterior air temperature is assumed to be the monthly average outside air temperature of the three coldest months.



Climate Zone Map from IECC 2021

Keep in Mind:
The IECC Climate Zones Differ from California's Energy Code Climate Zones

T24, Part 2.5 - Chapter 7 Walls, Section R702.7.3

TABLE R702.7.3—IECC VS. CALIFORNIA ENERGY CODE CLIMATE ZONE COMPARISON

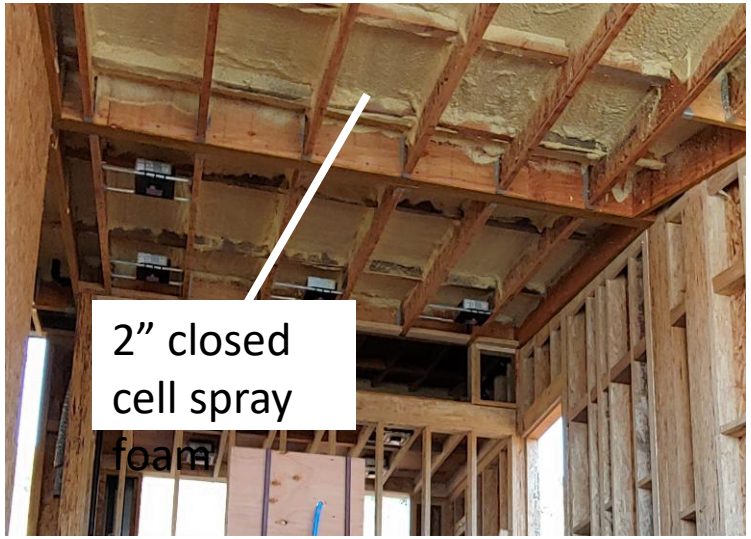
IECC[a]	CALIFORNIA ENERGY CODE	DESCRIPTION[b]
6	16	Includes Alpine, Mono Counties
5	11, 12, 16	Includes Siskiyou, Modoc, Lassen, Plumas, Sierra, Nevada Counties
4 (marine)	1, 2, 16	Includes Del Norte and Humboldt Counties
4	2, 12, 13, 16	Includes Inyo, Trinity, Lake, El Dorado, Amador, Calaveras, Tuolumne, Mariposa Counties
3	8, 9, 10,11,12, 13, 14, 15, 16	Includes Shasta, Tehama, Butte, Glenn, Colusa, Yuba, Contra Costa, Sutter, Yolo, Sacramento, Placer, San Joaquin, Solano, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, Kern, Ventura, Los Angeles, Orange, San Bernardino, Riverside Counties
3 (marine)	1, 2, 3, 4, 5, 6, 7, 9, 12, 16	Includes Mendocino, Sonoma, Marin, San Francisco, San Mateo, Alameda, Santa Cruz, Monterey, San Benito, San Luis Obispo, Santa Barbara, Ventura, San Diego Counties
2	14, 16	Includes Imperial County

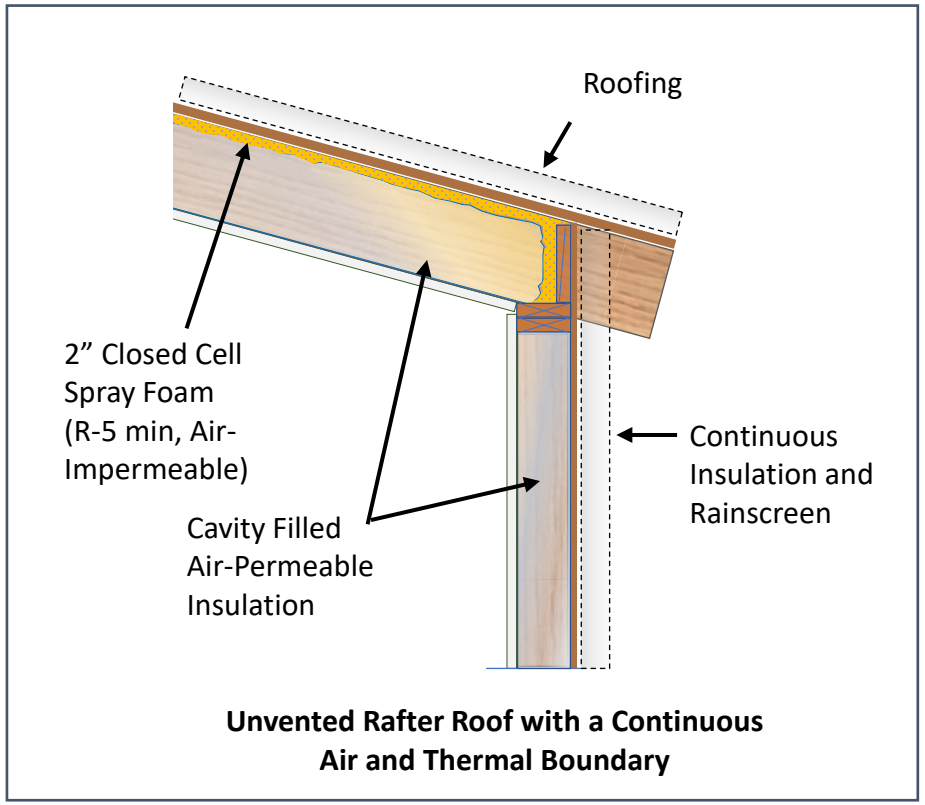
a. IECC Climate Zones 1, 7 and 8 do not occur in California, nor do any IECC moist climate zones.
b. IECC boundaries are defined by county political boundary lines. California Energy Code boundaries are based on metes and bounds specifications aligned with climate-affecting geographic features, which often do not coincide with county lines.

3C-REN is comprised of San Luis Obispo, Santa Barbara, and Ventura Counties, and are IECC climate zones **3** or **(3B)** and **3(marine)** or **(3C)**

Unvented Rafter Roof –Blown-in over Spray Foam

Keep in Mind:
Typically, 2” of Closed-Cell Spray Foam is needed as an Air-Impermeable Insulation





Unvented Rafter Roof with a Continuous Air and Thermal Boundary

Excerpts from R806.5.5.1.3

- Where both air-impermeable and air-permeable insulation are provided, the air-impermeable insulation shall be applied in direct contact with the underside of the structural roof sheathing…
- …[meet the] R-values in Table R806.5 for condensation control.
- … air-permeable insulation shall be installed directly under the air-impermeable insulation.

Reminder:
Table R806.5 for IECC Climate Zone 3C is R-5 for condensation control.

Unvented Rafter Roof – Batt over Spray Foam

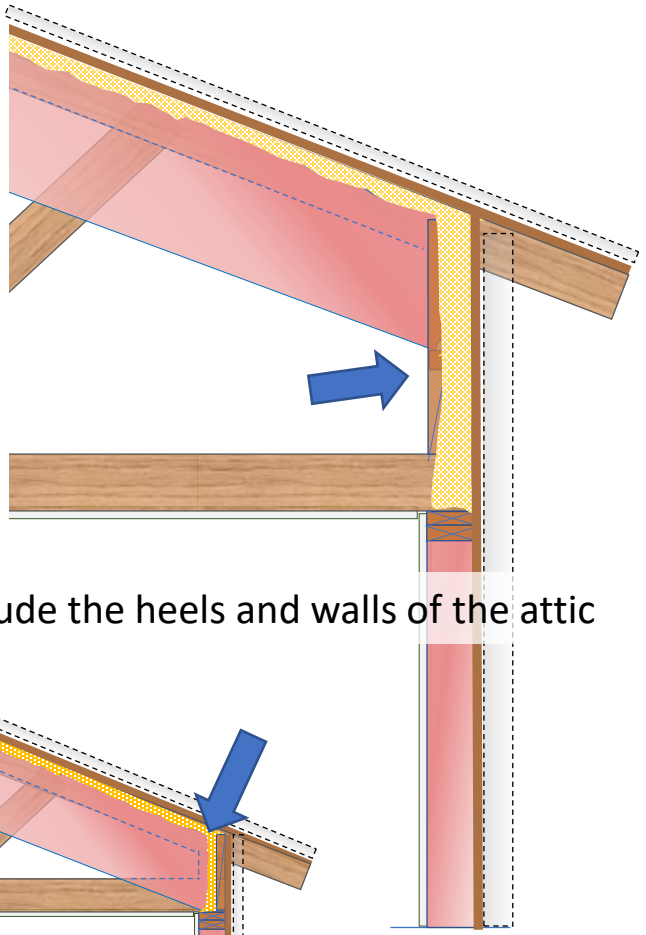
Excerpt from form CEC-CF2R-ENV-21-QII-H:

A. Air Barrier Materials

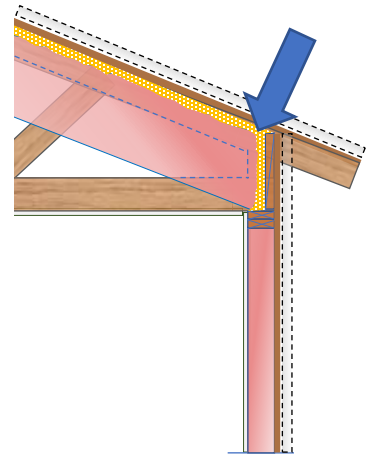
Note: SPF insulation is an acceptable air barrier and sealant when installed to a minimum thickness of 2 inches for closed cell and 5.5 inches for open cell, except where not allowed by manufacturer (e.g., flues, vents, can lights, etc.).

2” Closed Cell Spray Foam is adhered to underside of roof deck.

Remaining cavity is filled with Batt Insulation. (Blown-in insulation would also be acceptable.)



Include the heels and walls of the attic



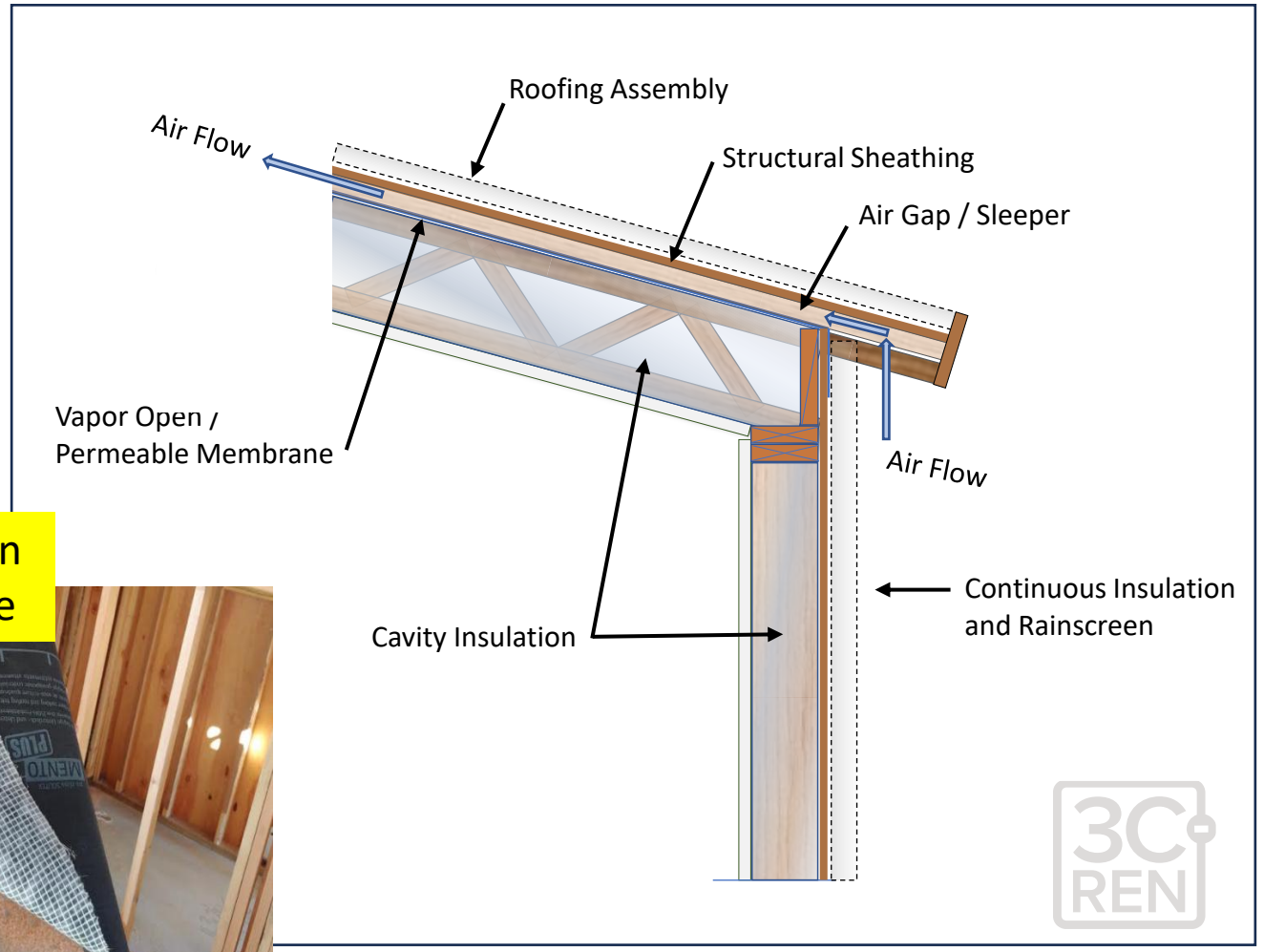
A Vented Rafter Roof Assembly with a ‘Smart’ Membrane

Run ‘sleepers’ along top of trusses or 2x rafters

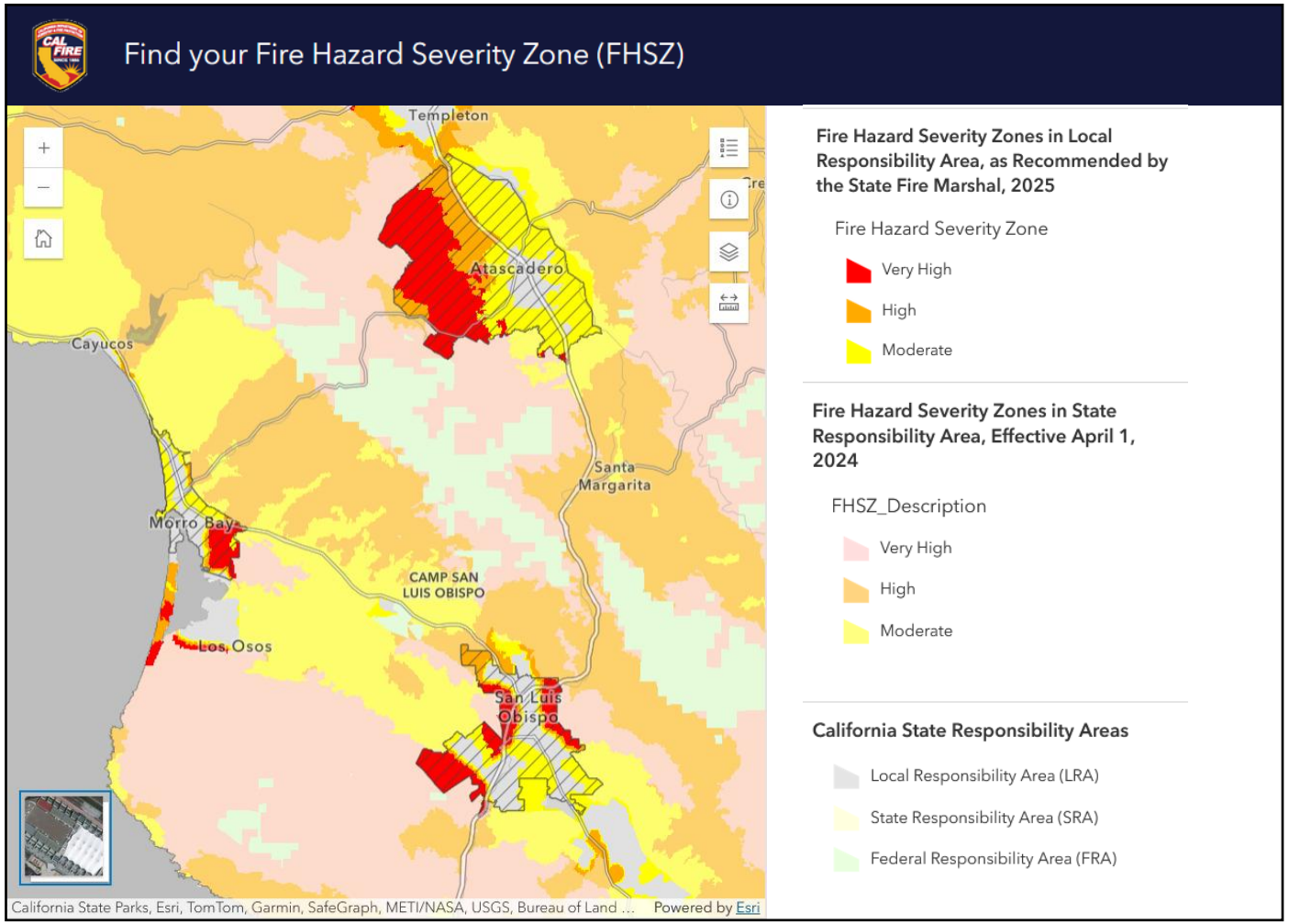
Photo/Project Credit: Cairn Collaborative

Looking from below before insulation

Vapor open membrane



Windows –Minimum Performance and WUI



https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones

2025 Energy Code:
Mandatory Measure: maximum weighted average **U-factor is U-0.40**

New Energy Code Exception to Mandatory U-factor:

- Windows and Skylights installed in buildings meeting [2025 Title 24] ***Part 7 of the California Building Code, California Wildland-Urban Interface Code*** –where buildings are located in Fire Hazard Severity Zones or WUI Fire Areas as designated by the local enforcement agency.

Resource: WUI Products Handbook

CALIFORNIA DEPARTMENT of FORESTRY
and FIRE PROTECTION
OFFICE OF THE STATE FIRE MARSHAL

STATE FIRE MARSHAL LISTED WILDLAND-URBAN INTERFACE (WUI) PRODUCTS HANDBOOK

Published by *CAL FIRE*
FIRE ENGINEERING AND INVESTIGATIONS DIVISION
BUILDING MATERIALS LISTING PROGRAM
September 2, 2025

Thermally Broken Steel Frame for Residential Construction

RIVIERABRONZE
Distinctive Design for Luxury Living

This product line is based in Ventura and meets the Residential Prescriptive U-factor and the WUI Fire Code requirements.

https://osfm.fire.ca.gov/what-we-do/fire-engineering-and-investigations/building-materials-listing

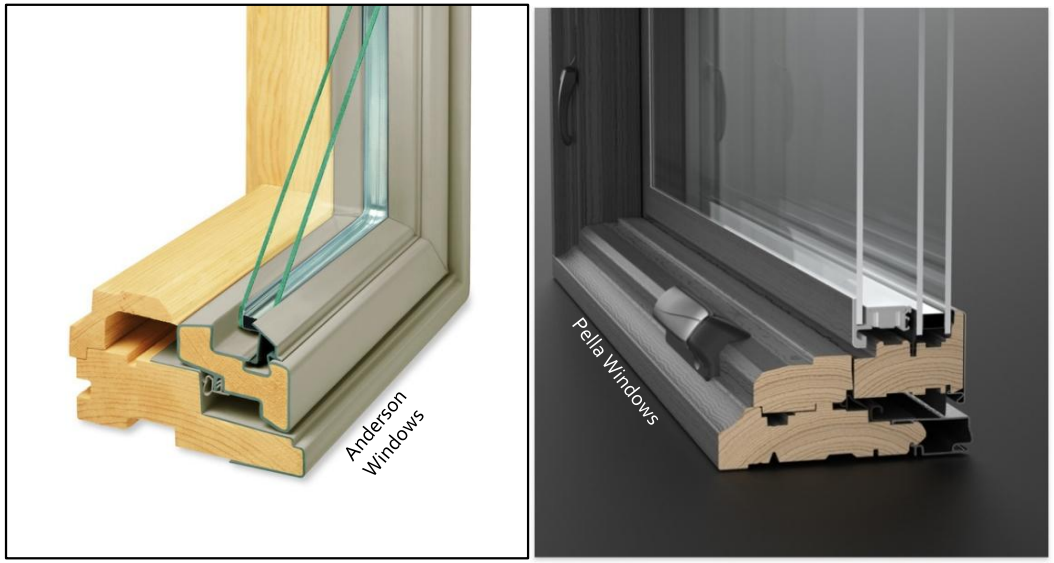
Prescriptive Requirements –Baseline for Performance Method

2025 Code:

- **U-0.30** for CZ 6-10 and 15
- **U-0.27** for CZ 1-5, 11-14, and 16

Exception: New dwelling units with a conditioned floor area of **500 sf** or less in **CZ 5** may comply with a max **U-0.30**.

- **SHGC** – Not Required for CZ 1, 3, and 5
- **SHGC-0.23** for CZ 2, 4, 6-14, and 16
- **SHGC-0.20** for CZ 15



Just about all brands of windows offer dual and triple paned options meeting the U-0.27 requirement

Battery Energy Storage Ready and Electric Ready

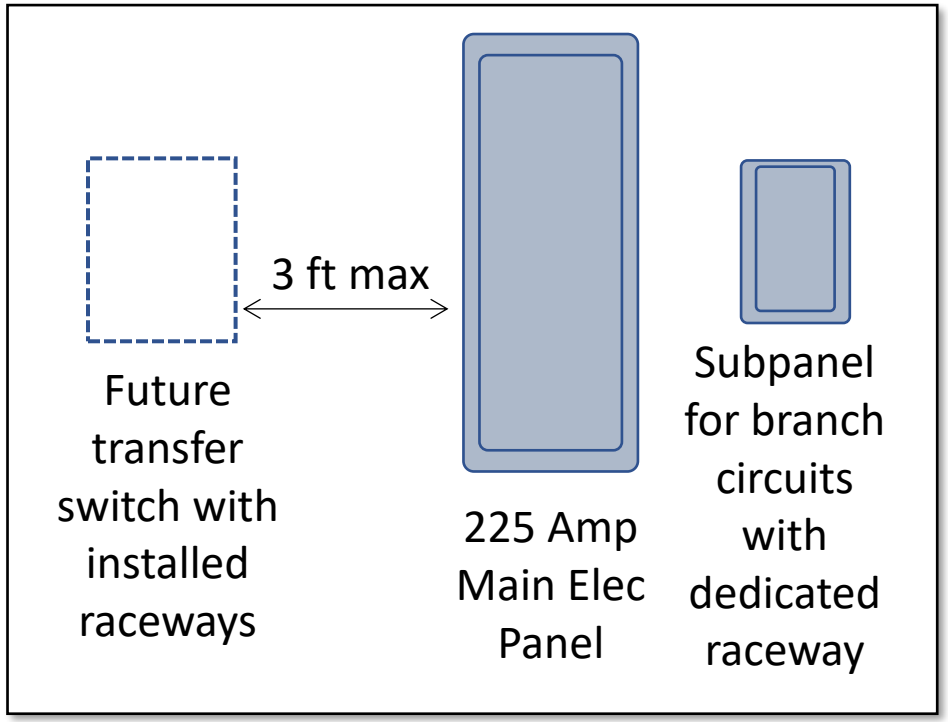
Energy Storage System (ESS) - “Battery Ready”

- Applicable new construction: Single Family, Duplex, or SF+ADU
- Infrastructure is Mandatory
- Battery is an optional credit
- Performance pathway:
  - Min Battery Size of 5 kWh
  - Needs to interface with the ‘Grid’
  - Performance credit is relatively small
  - Battery with PV system can be cost effective

Key Concept:
Intent is to increase a household’s electric generation and storage system to be able to offset evening **electrical grid** usage and address **resiliency**

“Battery Ready” – Infrastructure Required

- At least **one** of the following required:
  - **Interconnection equipment** with minimum backed up capacity of 60 amps
  - **Dedicated raceway** (min 1”) from the main service to subpanel that supplies the branch circuits
- A **minimum of 4 branch circuits** shall be identified feeding:
  - **Refrigerator**
  - **One lighting** circuit near the primary egress
  - A **sleeping room receptacle** outlet
- Main panel must have busbar rating of **225 amps minimum**
- Sufficient space shall be reserved to **allow future installation** of a system **isolation equipment or transfer switch** within 3 feet of the main panelboard
- **Raceways** shall be installed between the panelboard and the system isolation equipment or transfer switch location to **allow the connection of backup power source**

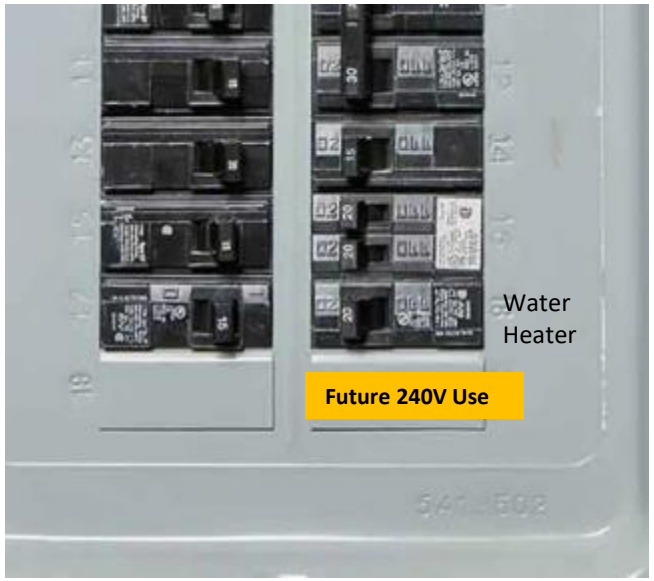


Change for 2025: Clarifies that only the load serving entity with a service greater than 125 amps shall meet the BESS ready requirements.

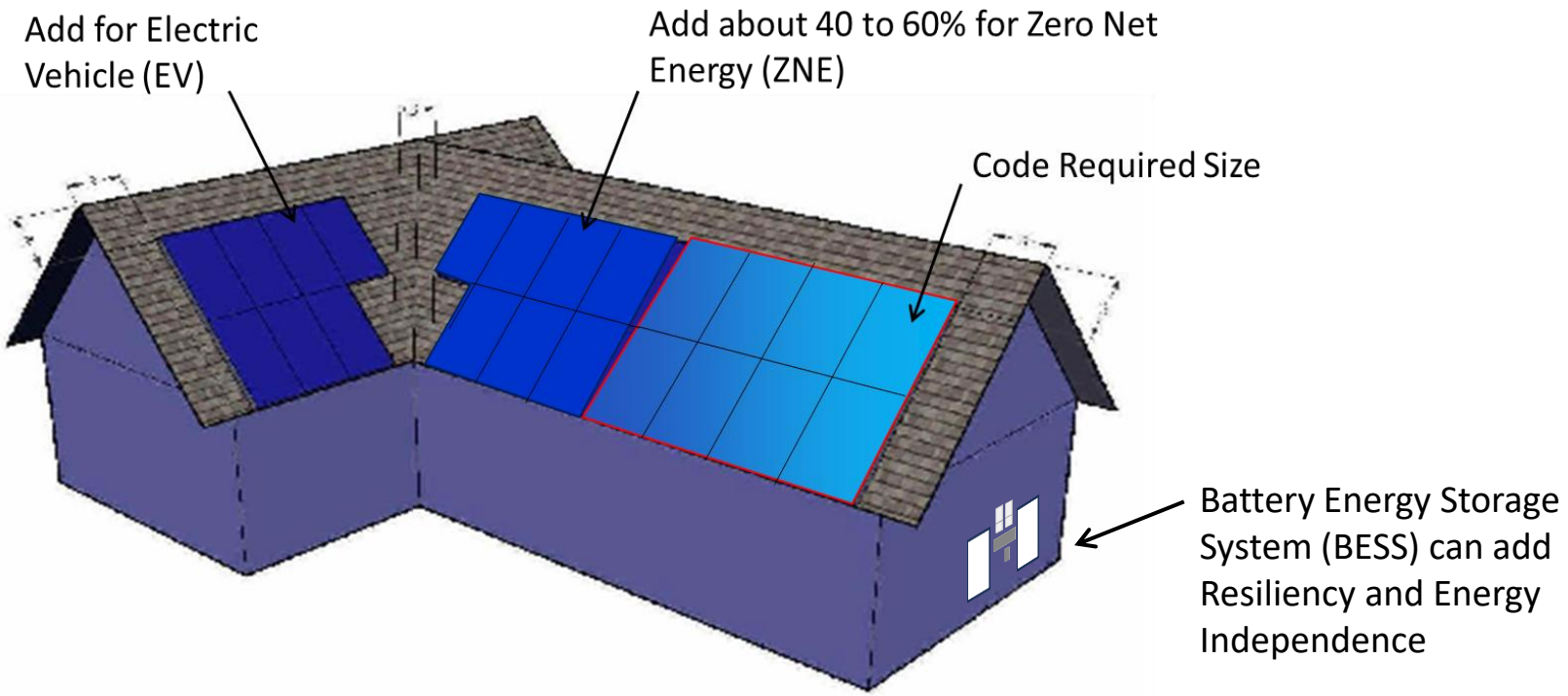
"Electric Ready" Infrastructure Required *only where* propane or natural gas appliances are installed in new construction

- **Water heaters**: gas or propane water heaters must be installed in or adjacent to a space large enough for a heat pump water heater HPWH. (2.5' x 2.5' x 7') Must install 240 volt/ 30amp circuit **150.0(n)**
- **Furnaces**: provide conductors rated at 240 volt/ 30 amp to the furnace for future heat pump installation- **150.0(t)**
- **Cooktops**: provide conductors rated at 240 volt/ 50 amp for future cooktop- **150.0(u)**
- **Dryers**: provide conductors rated at 240 volt/ 30 amp feed to dryer - **150.0(v)**

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



2025 Energy Code –BESS and Self-Utilization Credit



For Example: New Construction 2000 SF home in Atascadero (climate zone 4) a 2.38 kW system would be required.
Santa Barbara and Ventura coastal areas would be slightly less.

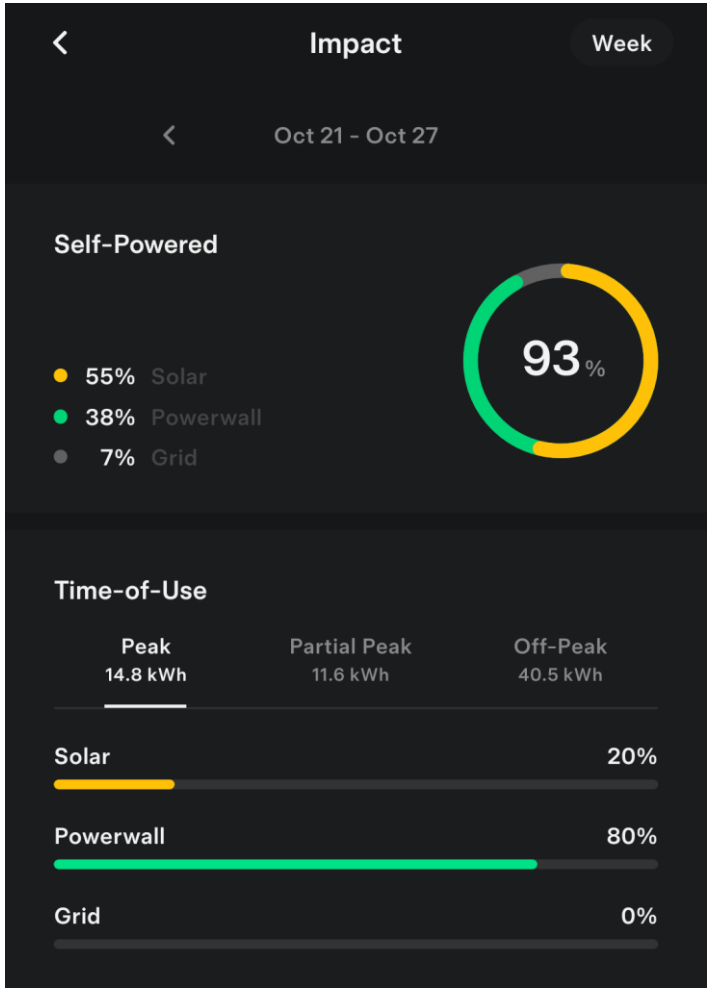
Definition Updated:

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.

New Construction Solar Required, Battery Storage Optional

Battery Storage: Two batteries are providing whole home back-up – for the most part…

Depending on one's driving milage, electric cars can add significant loads.



Heat Pumps for Space Conditioning and the VCHP Credit

Prescriptive Heat Pump (HP) Space Conditioning

2025 Code:

- All Climate Zones
- Heat pump space heating is Prescriptively required
- ECC Field Verification: HP refrigerant charge

EXCEPTION: A supplemental heating unit that does not exceed 2 kW or 7,000 Btu/hr and is controlled by a time-limiting device not exceeding 30 minutes.

Note:

Performance pathway allows for NG or Propane Furnaces

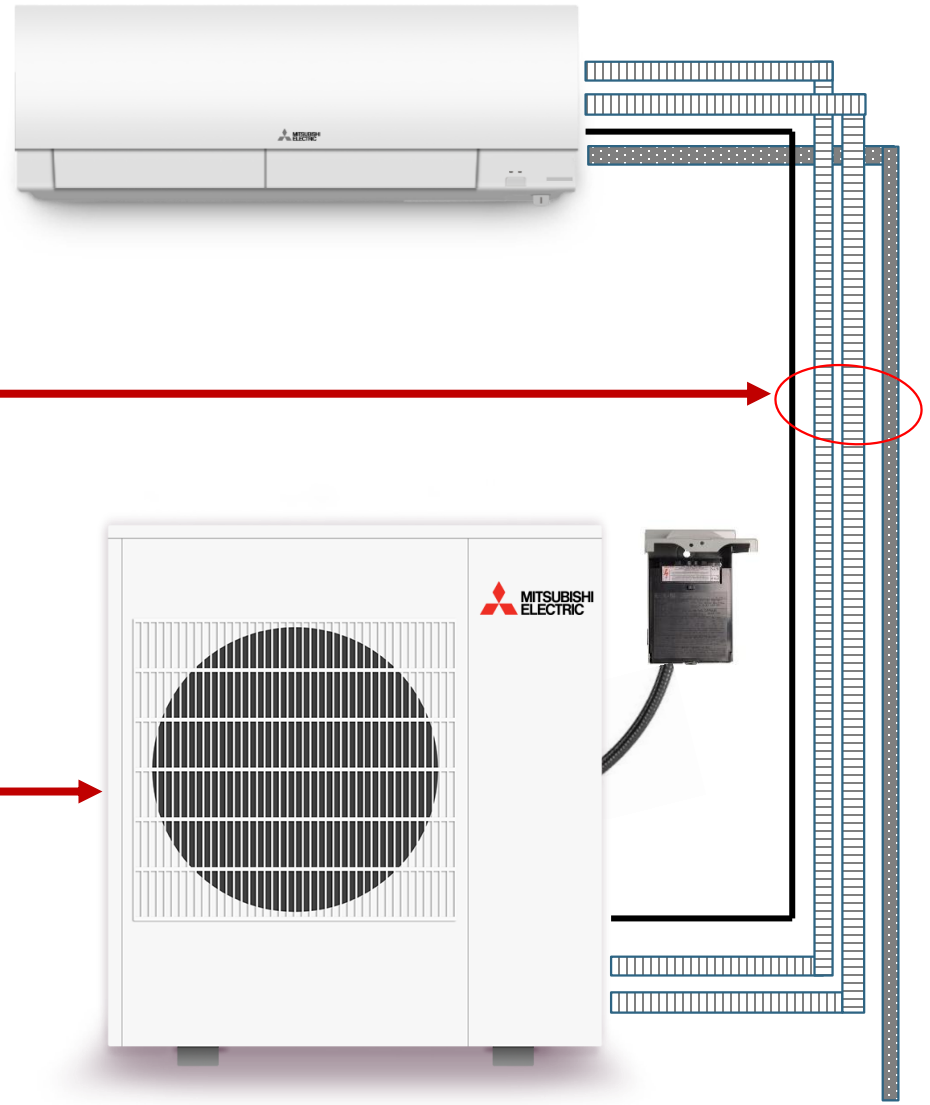
Mini-split Heat Pumps – Outdoor Condensing Units

Ductless ‘Mini-Split’ Heat Pump with Variable Capacity

Indoor Unit –Head with multi-speed fan controls

- Line Set Pair/Piping –Insulated Copper Refrigerant Tubing
- Condensate Line –Drain Hose
- Power Cord –Connecting to the Indoor Unit (aka Communication Wire)

Outdoor Unit –Compressor/Condenser Includes electronic expansion valve for variable refrigerant flow and multi-speed compressor and fan



Note: Can typically have four indoor units per each outdoor unit.

Variable Capacity Heat Pump (VCHP) Compliance Option – High Credit, Required Special Features and HERS Triggered

CF1R-PRF-01-E

REQUIRED SPECIAL FEATURES

The following are features that must be installed as condition for meeting the modeled energy performance for this computer analysis.

- Variable capacity heat pump compliance option (verification details from VCHP Staff report, Appendix B, and RA3)
- Compact distribution system basic credit
- Northwest Energy Efficiency Alliance (NEEA) rated heat pump water heater; specific brand/model, or equivalent, must be installed

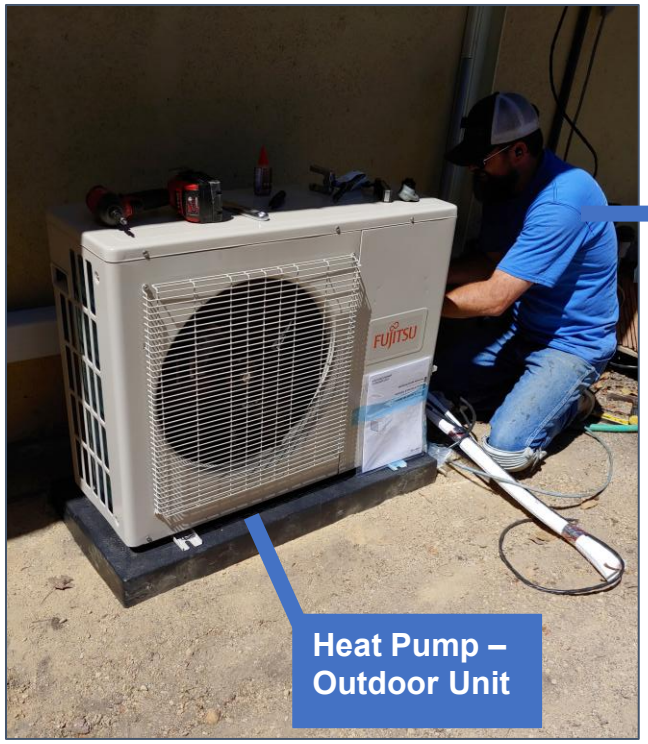
HERS FEATURE SUMMARY

The following is a summary of the features that must be field-verified by a certified HERS Rater as a condition for meeting the modeled energy performance for this computer analysis. Additional detail is provided in the building tables below. Registered CF2Rs and CF3Rs are required to be completed in the HERS Registry

- Quality insulation installation (QII)
- Indoor air quality ventilation
- Kitchen range hood
- Verified EER/EER2
- Verified SEER/SEER2
- Verified Refrigerant Charge
- Airflow in habitable rooms (SC3.1.4.1.7)
- Verified HSPF2
- Verified heat pump rated heating capacity
- Wall-mounted thermostat in zones greater than 150 ft2 (SC3.4.5)
- Ductless indoor units located entirely in conditioned space (SC3.1.4.1.8)

Heat Pumps Installation and HERS

Best time to verify refrigerant charge and equipment capacity, efficiency, etc. is during the installation



Installing Contractor

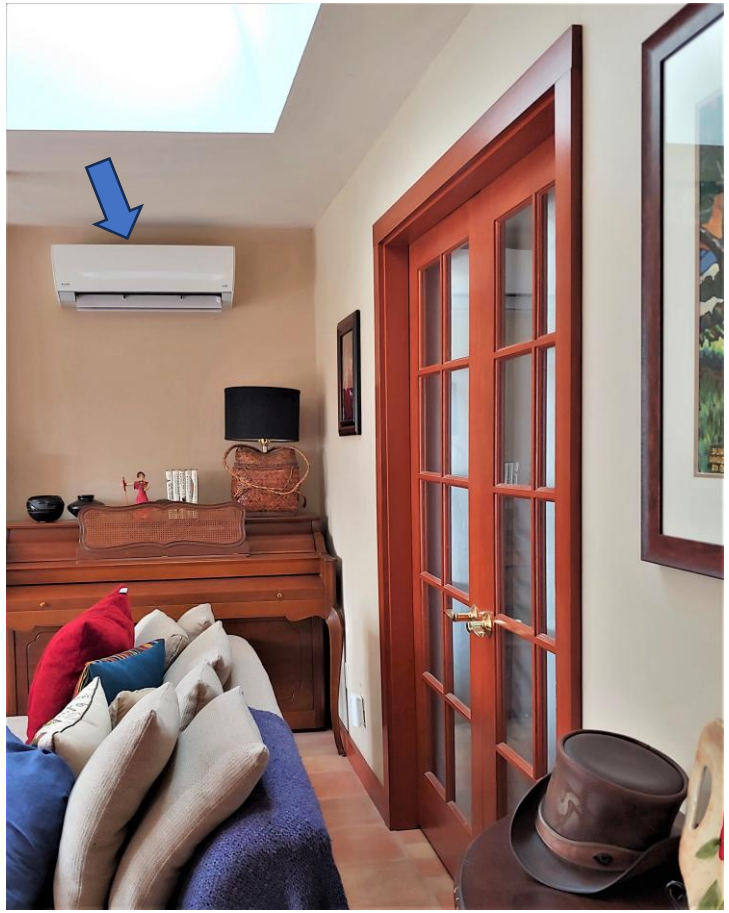
Heat Pump – Outdoor Unit

Specs in the Box Needed by HERS Rater

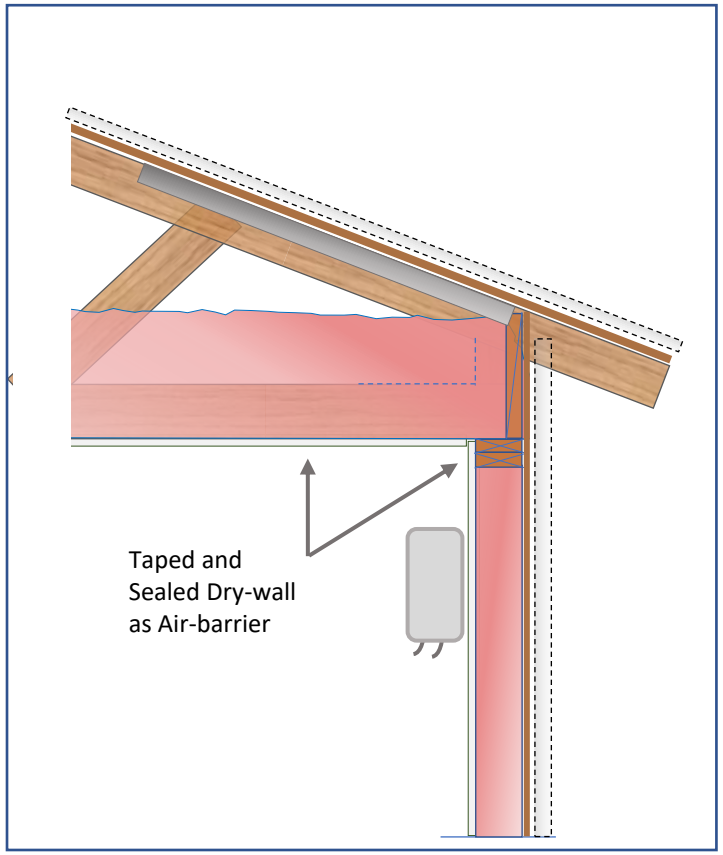
Refrigerant Line Set

Indoor units shall be installed within the air and thermal boundaries, with air flow to each habitable room, i.e. ea bedrm and living area; wall thermostats required in zones larger than 150 sq ft..

Wall and Ceiling Penetrations for the Mechanical System Refrigerant, Condensate, and Communication Lines need to be Air Sealed.



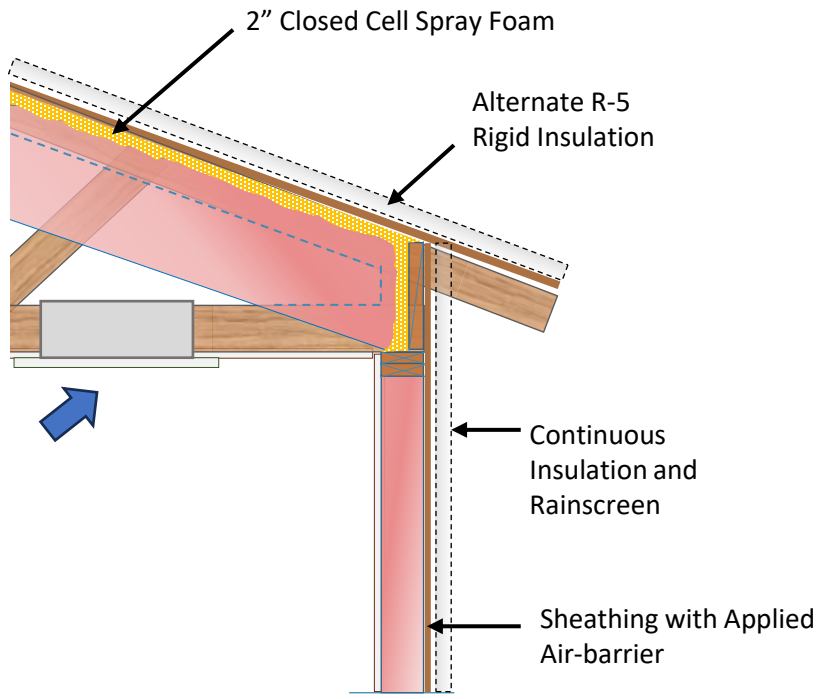
Ductless Wall Mount



Vented Attic with a Continuous Air and Thermal Boundary

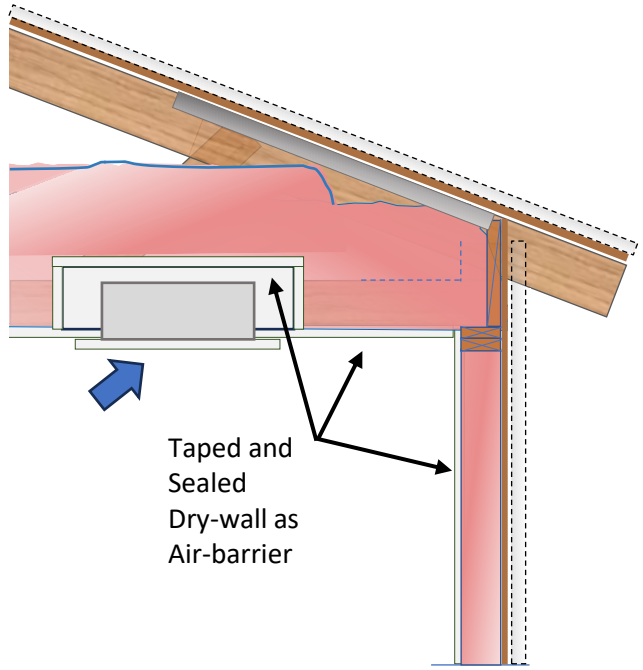
VCHP Compliance Credit Impacts the Envelope Enclosure

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

Indoor Air Quality Ventilation

Ventilation –Indoor Air Quality (IAQ)

ASHRAE 62.2 continues to be the basis for Section 150.0(o):

- Quantity of outside air (OA) ventilation,
- Allowable methods of meeting the OA ventilation; and
- Field verification of IAQ system(s)

For newly constructed buildings and additions greater than 1,000 ft^2

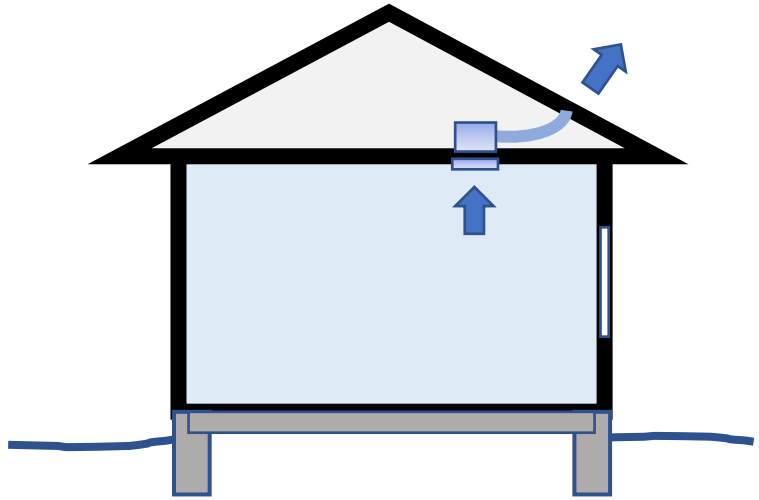
Section 150.0(o)

- Kitchen Hood Exhaust
- Bathroom Exhaust
- Outside Air (OA)
  - Mechanically Induced
  - Infiltration

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** shall have demand controls and meet min ventilation flow or capture efficiency requirements
- **Enclosed Kitchens and Bathrooms** can use continuous ventilation systems that are part of Energy or Heat Recovery Balanced Ventilation (ERV/HRV) Systems



Local Mechanical Exhaust

Reminder:
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**."

Requirements for Ventilation Indoor Air Quality (IAQ)

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

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

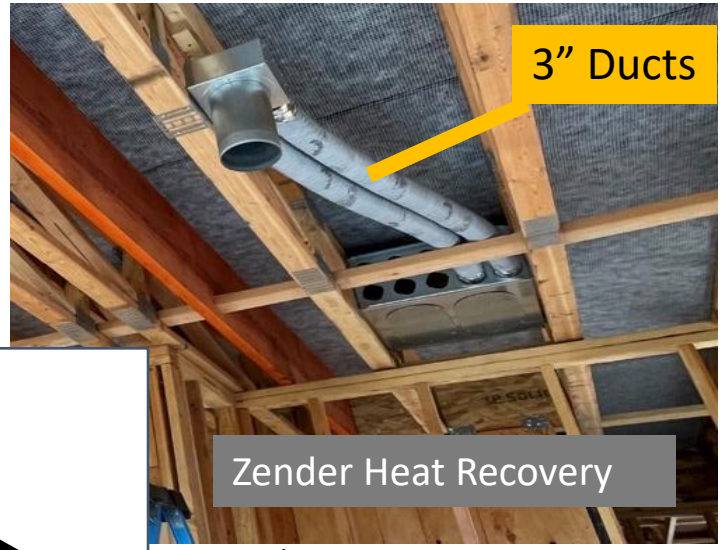
Where:
Q_{total} = Total required ventilation rate (CFM)
A_{floor} = Conditioned floor area in square feet (ft^2)
N_{br} = Number of bedrooms (not fewer than one)

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

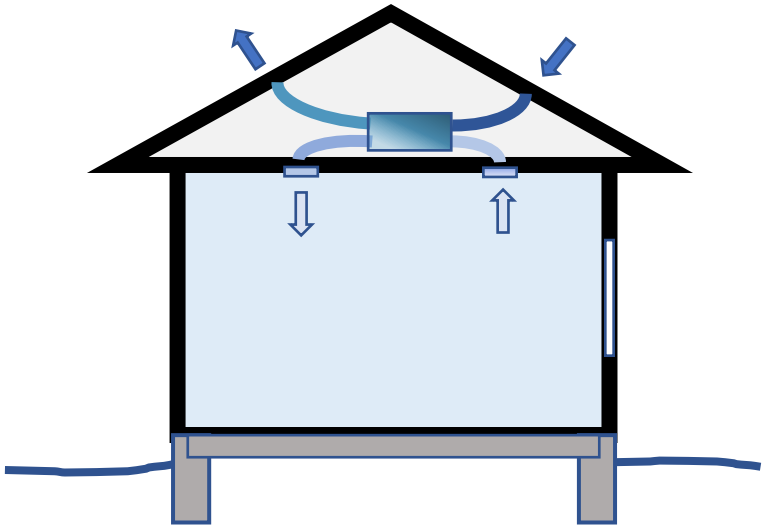
This equation can be a good *estimate* for the required IAQ Ventilation. The calculated required IAQ Ventilation is also dependent on several infiltration rate equations, which can lower the required IAQ Ventilation rate overall.

Balanced Ventilation with Energy or Heat Recovery (E/HRV)

- Whole House Systems
- ‘Spot’ HRV/ERVs



Image/Project: Cairn Collaborative


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

- Performance Credit Available
- Must be HVI –Certified Products Directory listed for credit (HVI.org)

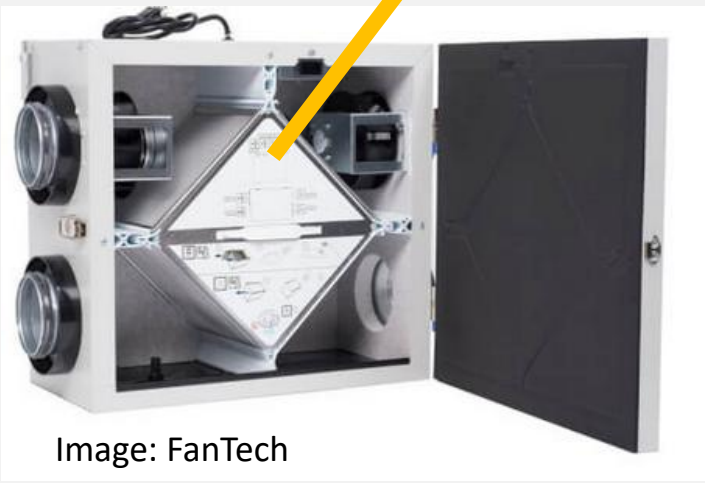
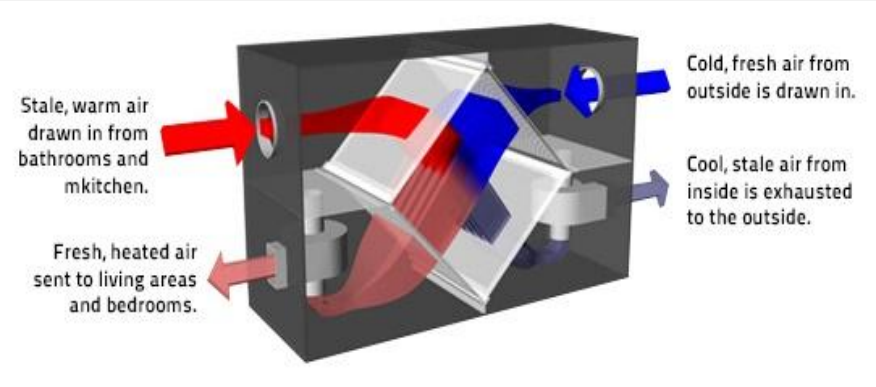
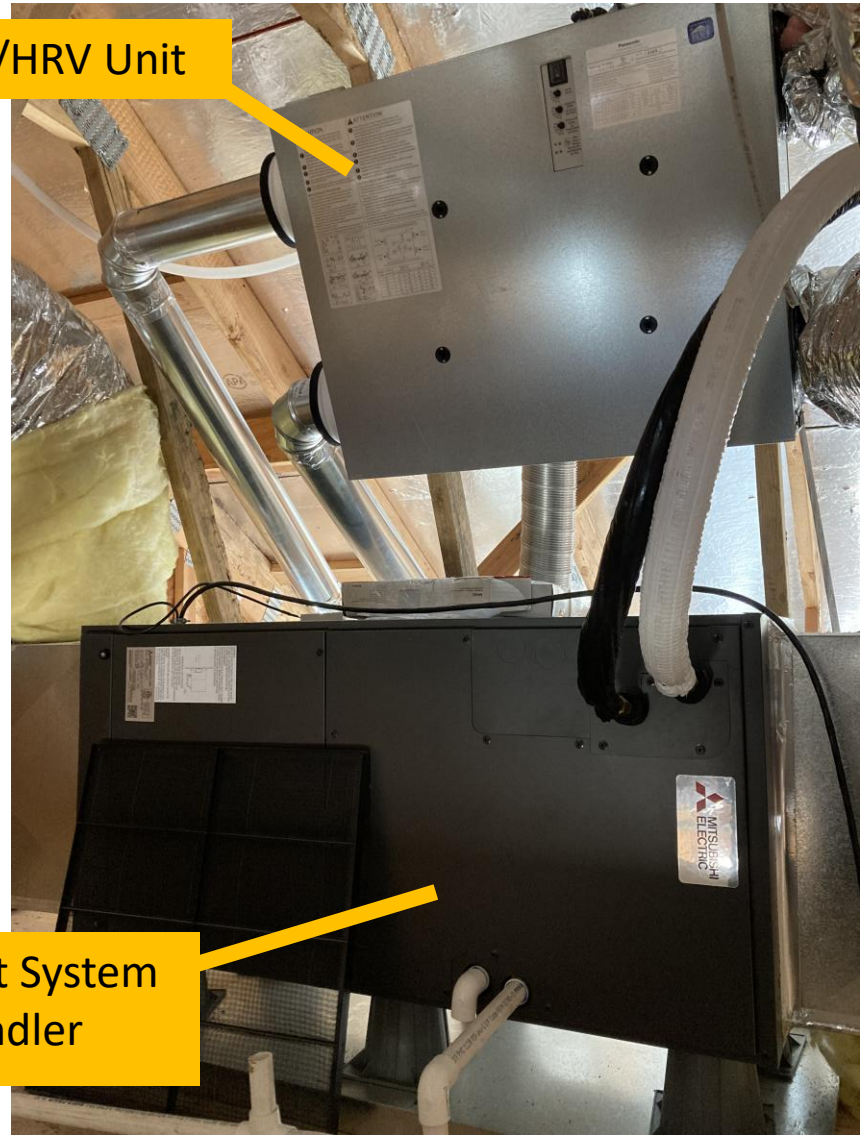


Image: FanTech



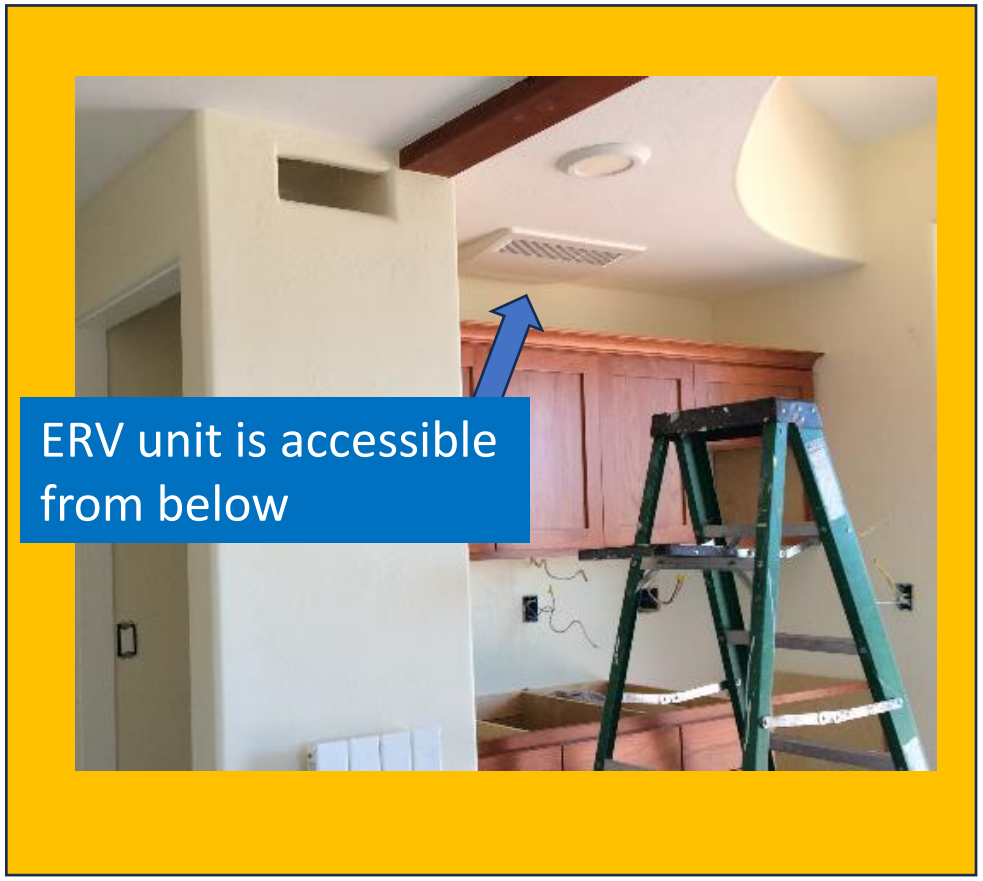
Conceptual Diagram of Heat Recovery

E/HRV Installation with a Ducted HP Split System



Managing client expectations

- **Unit Access:** Can homeowner easily access filters?
- **Expectation**: Is homeowner / occupant able to locate and purchase the proper filters?
- **Owner Maintenance:** MERV 13 / HEPA filters may need replacing 4 times/yr; Other dust filters need washing/vacuuming 4 times/yr; Core HRV/ERV Filters need to be cleaned once a year min.
- **Owner Operation**: Does homeowner / occupant know how to turn off the system in case of poor outdoor air quality? Are the controls easily accessible and labeled?
- **Unit Location:** Reminder that noise and cold/cool air can be problematic for some occupants



New for 2025: Mandatory Measures for IAQ and HRV/ERV Systems

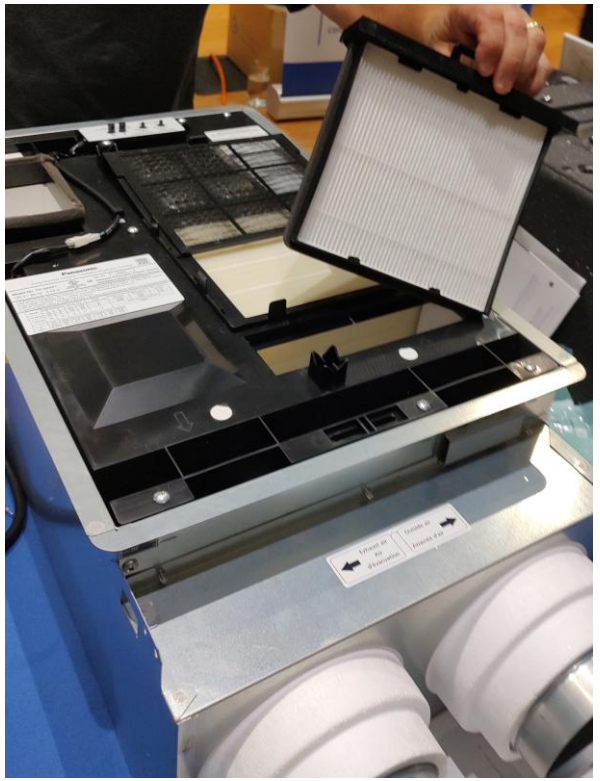
Applicable to balanced and supply-only ventilation systems:

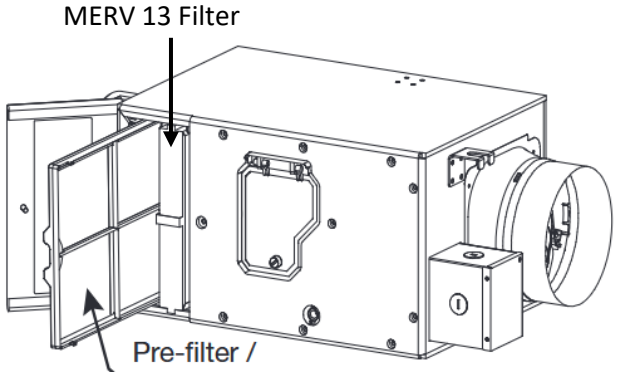
Air Filters and HRV/ERV Recovery Cores:

- Accessible from occupiable spaces
- Located no more than 10 feet above a walking surface
- Attic locations require Fault Indicator Display (FID) and have walkway to the HRV/ERV.

Outdoor Air Intakes

- Be “weather/rain proof”
- Located no more than 10 feet above a walking surface, or utilize FID
- Roof locations have additional access requirements





2025 New Section

iv. Requirements for balanced and supply only ventilation systems

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, and mechanical closets. Filters and heat/energy 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 150.0(o)1Civa: Systems that require servicing from inside the attic shall have the following:

1. A Fault Indicator Display (FID) meeting the requirements of Reference Appendix JA17; 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 Section 304.0 accessibility for service.

c. Outdoor air intake design: Outdoor air intakes shall comply with California Mechanical Code Section 402.4.1.

d. Outdoor air intake location and accessibility: To provide access for cleaning, outdoor air intakes shall be accessible. Air intakes located not more than 10 feet above a walking surface comply with this requirement. If located on roofs, they shall meet the requirements of California Mechanical Code Section 304.3.1.

Exception to Section 150.0(o)1Civd: Outdoor air intake serving equipment with an FID meeting requirements of Reference Appendix JA 17.

Equipment Access Criteria –Visual HERS Verification

Table 22: IAQ System Component Accessibility Criteria

Dwelling Unit Ventilation System Component	Location	Accessible Determination
Outdoor Air Intake	All locations	Intake louvers, grilles, or screens shall be >3/8 inches except where prohibited by local jurisdictions or other code requirements.
Outdoor Air Intake	Exterior wall, soffit, or gable end	A point on the perimeter of the outdoor air intake shall be located within 10 feet of a walking surface or grade or the system shall meet the IAQ System FID requirements in the ACM Reference Manual.
Outdoor Air Intake	Roof	Access shall be provided in accordance with California Mechanical Code Section 304.3.1 requirements for appliances.
Filters and Heat Exchangers	Serviceable from conditioned space, unconditioned basements, or mechanical closets. Heat exchangers may also be serviceable from unconditioned attics if the IAQ system meets the FID requirements in the RACM Reference Manual.	The H/ERV or supply ventilation system access panel shall be located within 10 feet of the walking surface.

Questions about Title 24?

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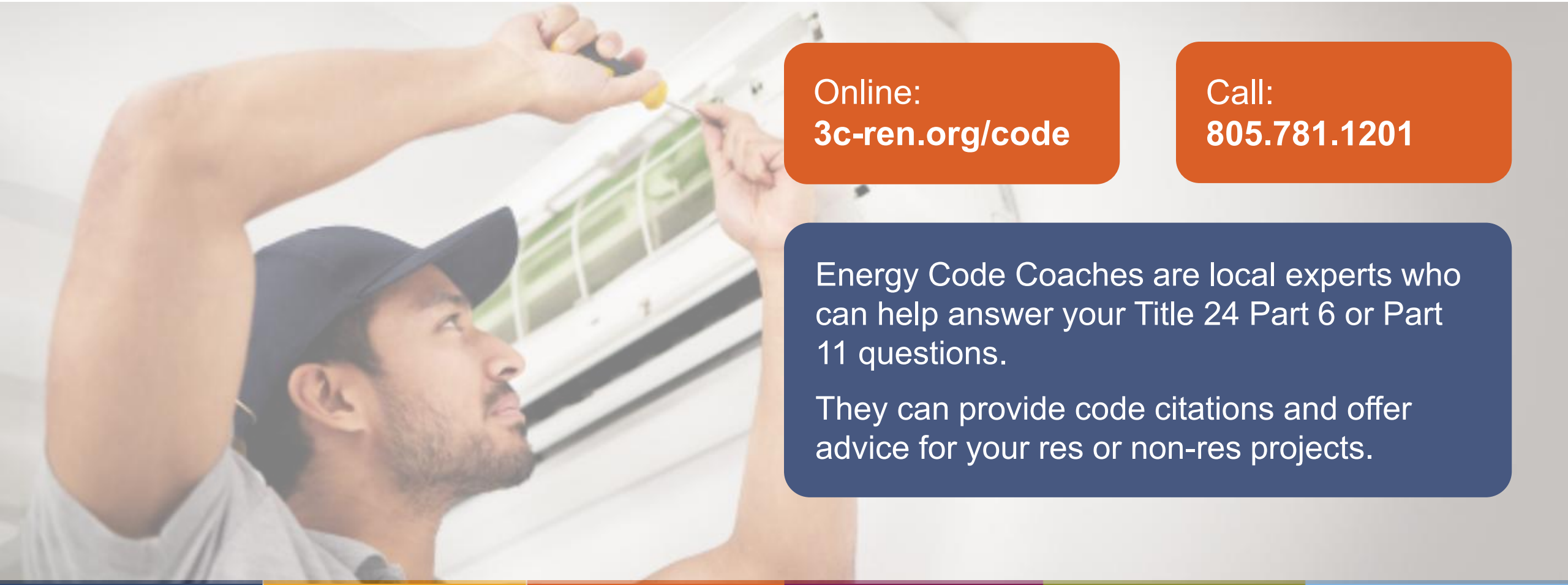

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