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

2025 Energy Code in Practice: ADUs

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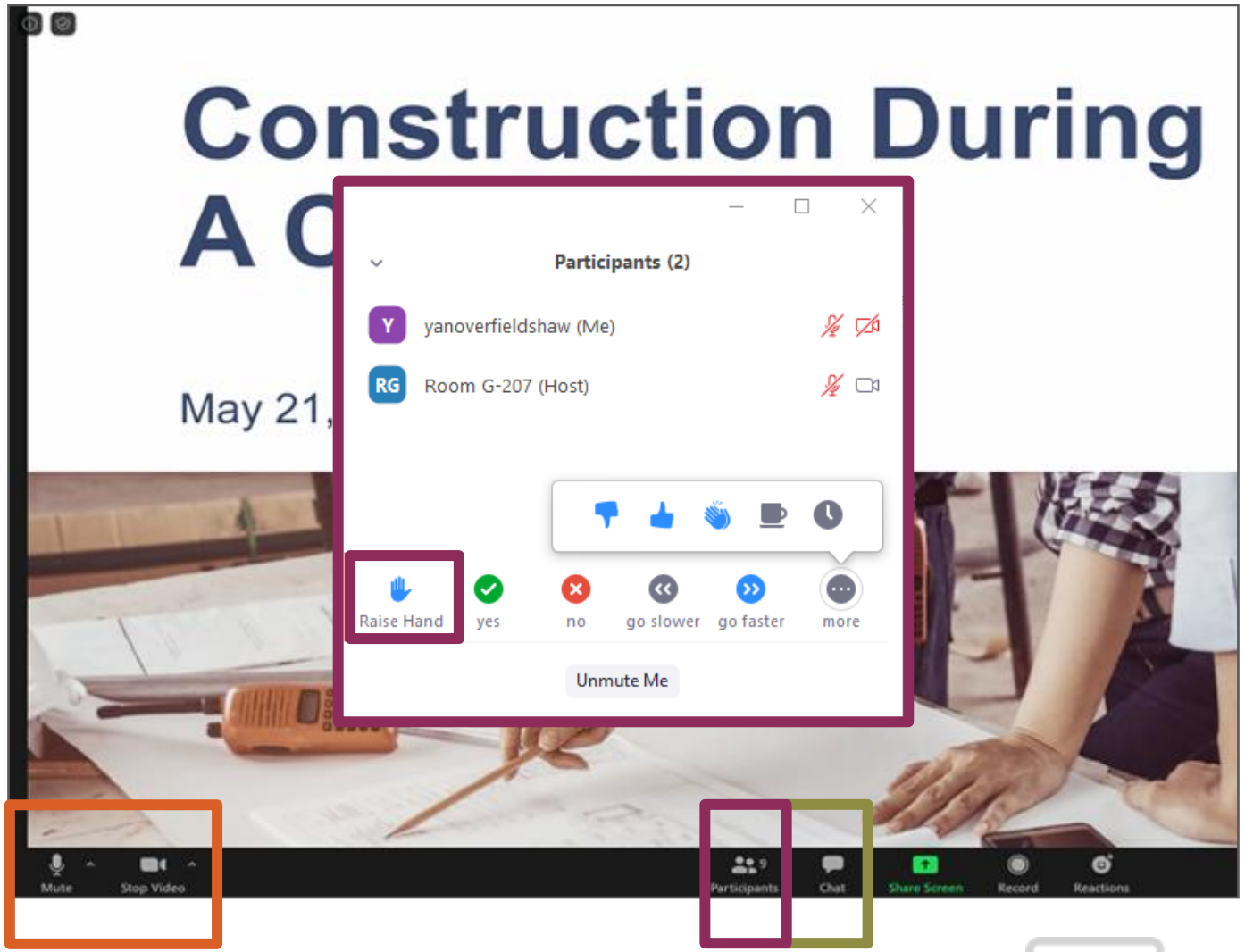
In Balance Green Consulting

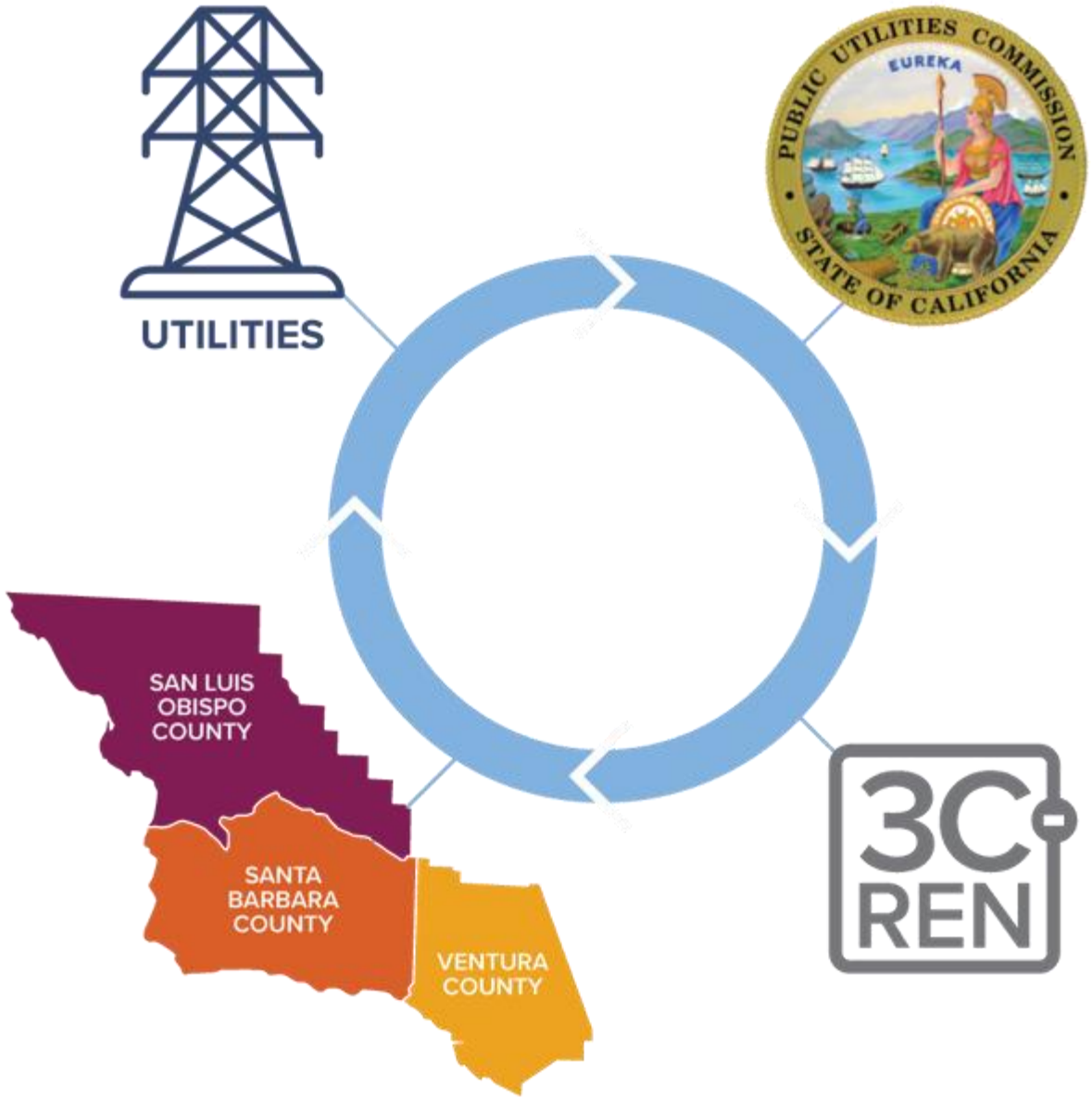
April 08, 2026

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

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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.

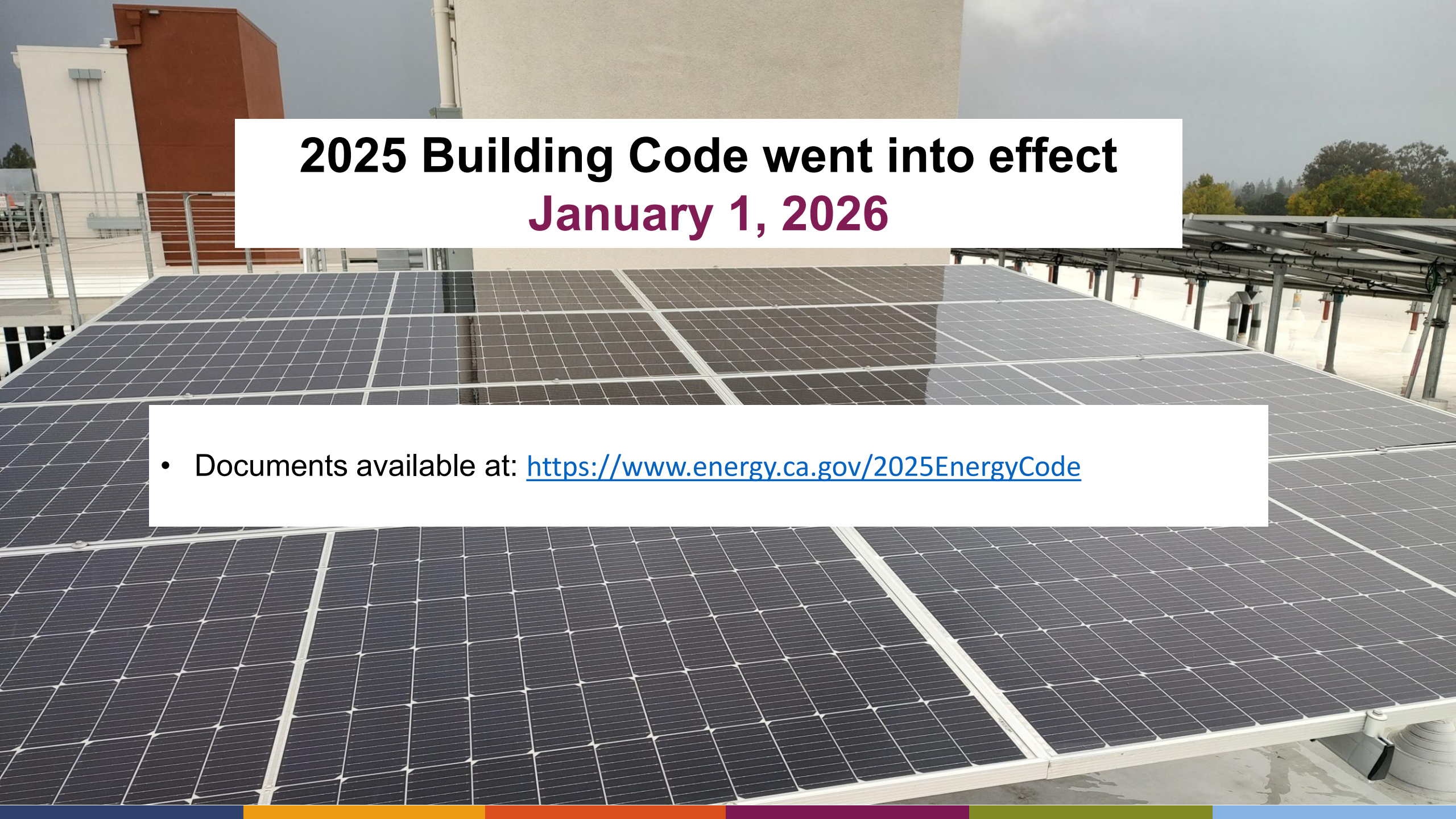
Learning Units:

- 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. Code Overview with 2025 Code Highlights
2. Accessory Dwelling Units (ADUs)
3. PV, Battery and Electric Ready
4. Roof, Walls and Windows
5. Domestic Water Heating
6. Heat Pumps for Space Conditioning
7. IAQ Ventilation
8. Resources and Wrap-up

2025 Energy Code Overview



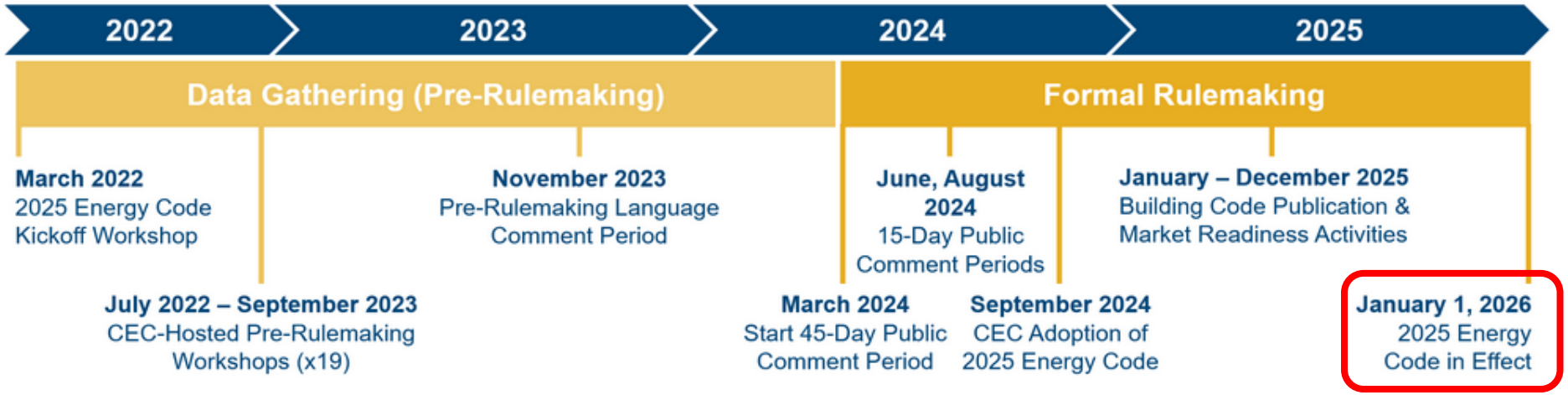
2025 Building Code went into effect
January 1, 2026

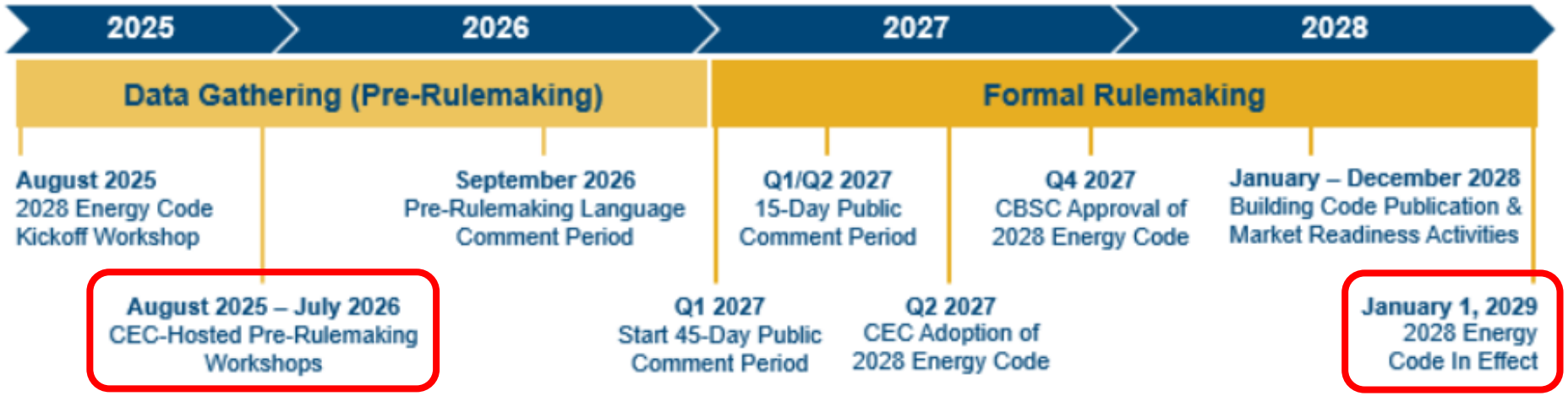
- Documents available at: https://www.energy.ca.gov/2025EnergyCode

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*

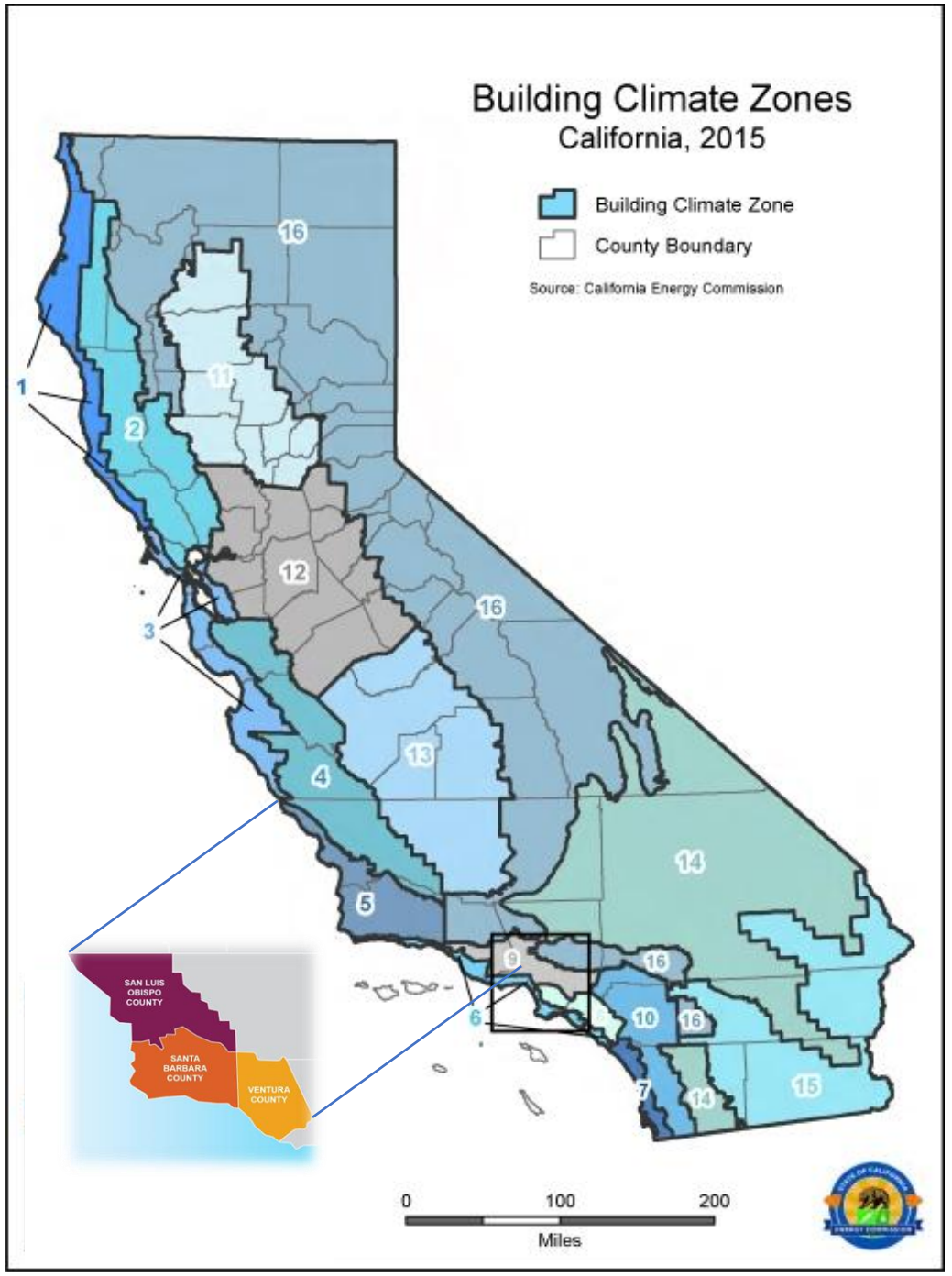
Focus on 3C-REN Tri-County Region

San Luis Obispo, Santa Barbara, and Ventura

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

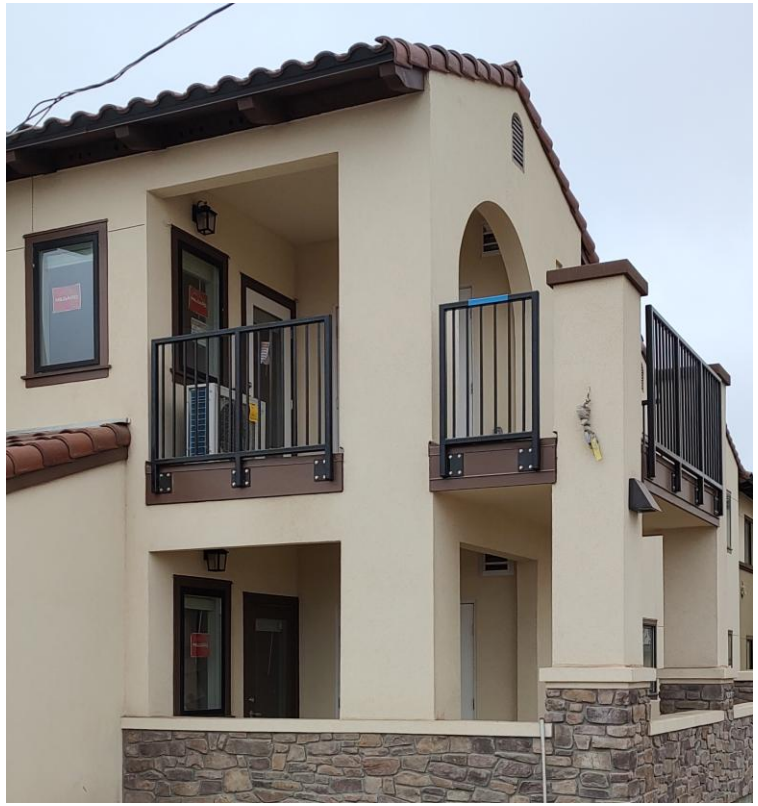
Under the Building Energy Efficiency Standards California has 16 defined Climate Zones (CZ)

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



Residential High-Level Changes

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



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

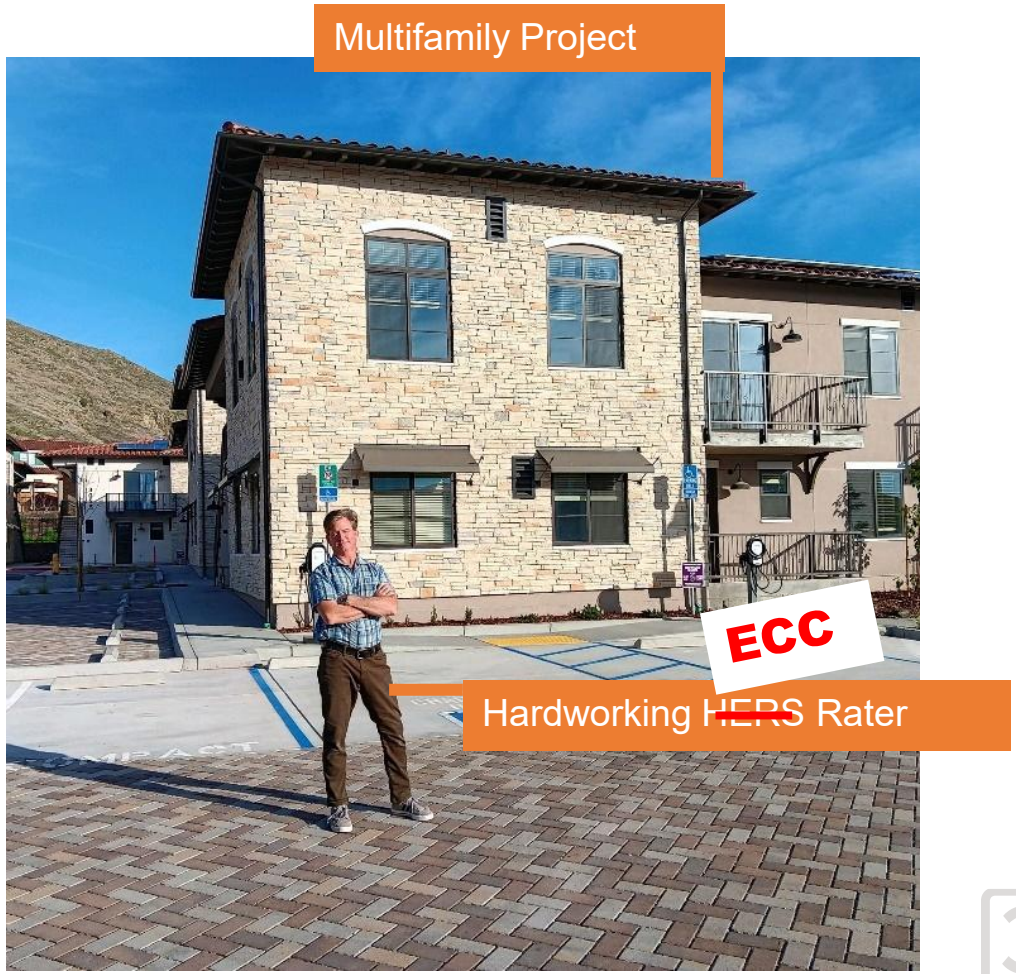
TDV = Time Dependent Valuation (kbtu/ft2-yr)
EDR*e* = Energy Design Rating -*efficiency* (Score 0-100)
EDR*t* = Energy Design Rating -*total* (Score 0-100)
EDR*s* = Source Energy Design Rating (kbtu/ft2-yr as a proxy for carbon)

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.

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



The Energy Code –Three Compliance Terms

Mandatory Requirements

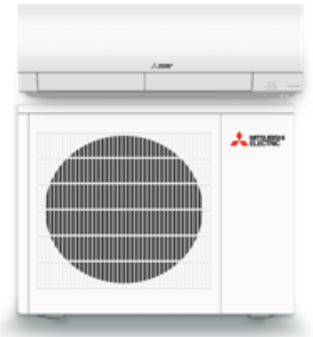
Energy efficiency measures that are applicable to all projects.

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

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 –formerly a HERS Rater
- **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

Accessory Dwelling Units (ADUs)

Benefits of Accessory Dwelling Units


Image Courtesy of Julie Clayton, AIA

- Affordable
  - No new land purchase
  - No major infrastructure needed
- Family & Community Connection
  - Extended Family
  - Essential Workers
- Flexible Living
  - Aging in Place
  - Home Healthcare
- Rental Income

ADU– Accessory Dwelling Unit

ADU is an accessory dwelling unit with **complete independent living facilities** for one or more persons with permanent provisions for living, sleeping, eating, cooking and sanitation.

- Can have a “full” or “efficiency” kitchen, i.e. cooking facility with appliances and reasonably sized food prep counter and storage (*definition: www.3c-ren.org/efficiency-kitchen*)
- Has independent bathroom facilities
- Must have a heating and cooling system that does not sharing air with another dwelling.
- Has its own thermostat, i.e. independent controls

Image Courtesy of Julie Clayton, AIA

JADU – Junior Accessory Dwelling Units

Conversion of existing space that is no more than 500 sq. ft. and is **contained entirely within an existing or proposed single-family residence**.

- May include separate or shared sanitation facilities
- May have an interior access door
- If have shared sanitation facilities, owner occupied requirements kick-in
- Has a door to the exterior
- Has an “efficiency” kitchen, i.e. cooking facility with appliances and reasonably sized food prep counter and storage
- May share central HVAC systems

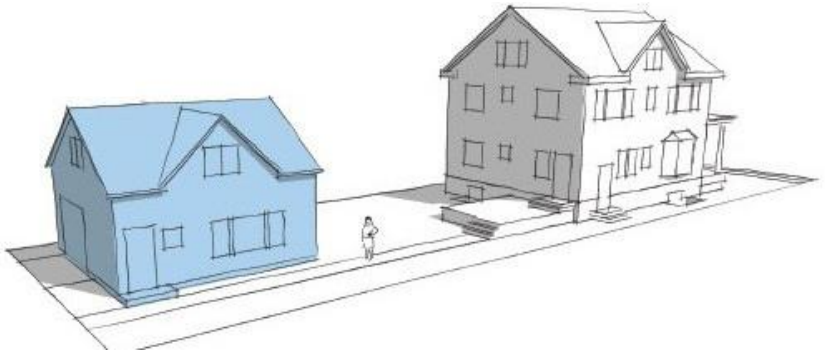
Photo: ADU Resource Center

Common Allowable ADU and JADU "Types"

In the language of the Energy Code

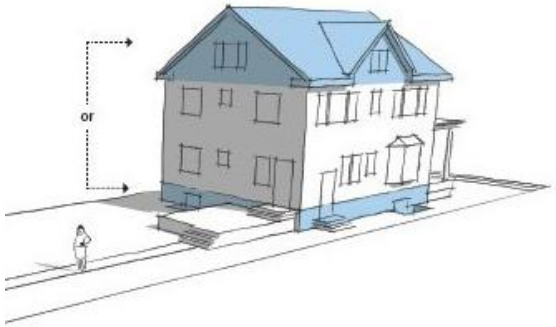
Energy Code: New Construction

Detached [New Construction]



Energy Code: Alterations and Additions

Attached (Internal)



Internal / [Detached] Conversion

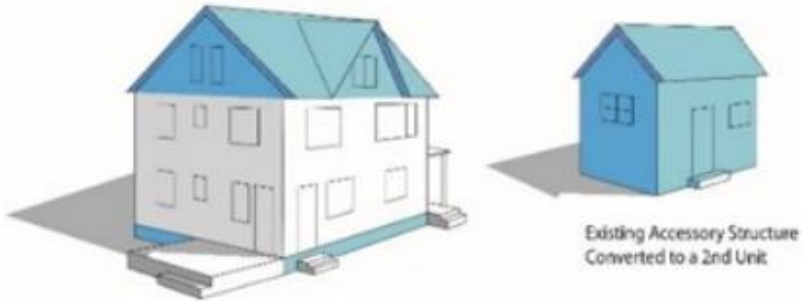
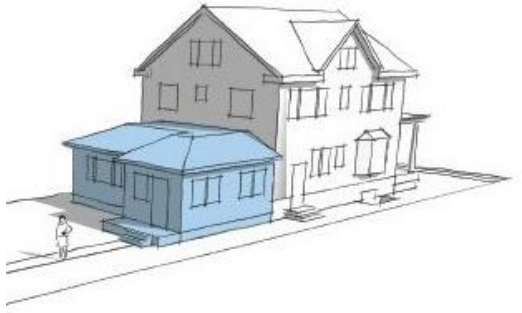


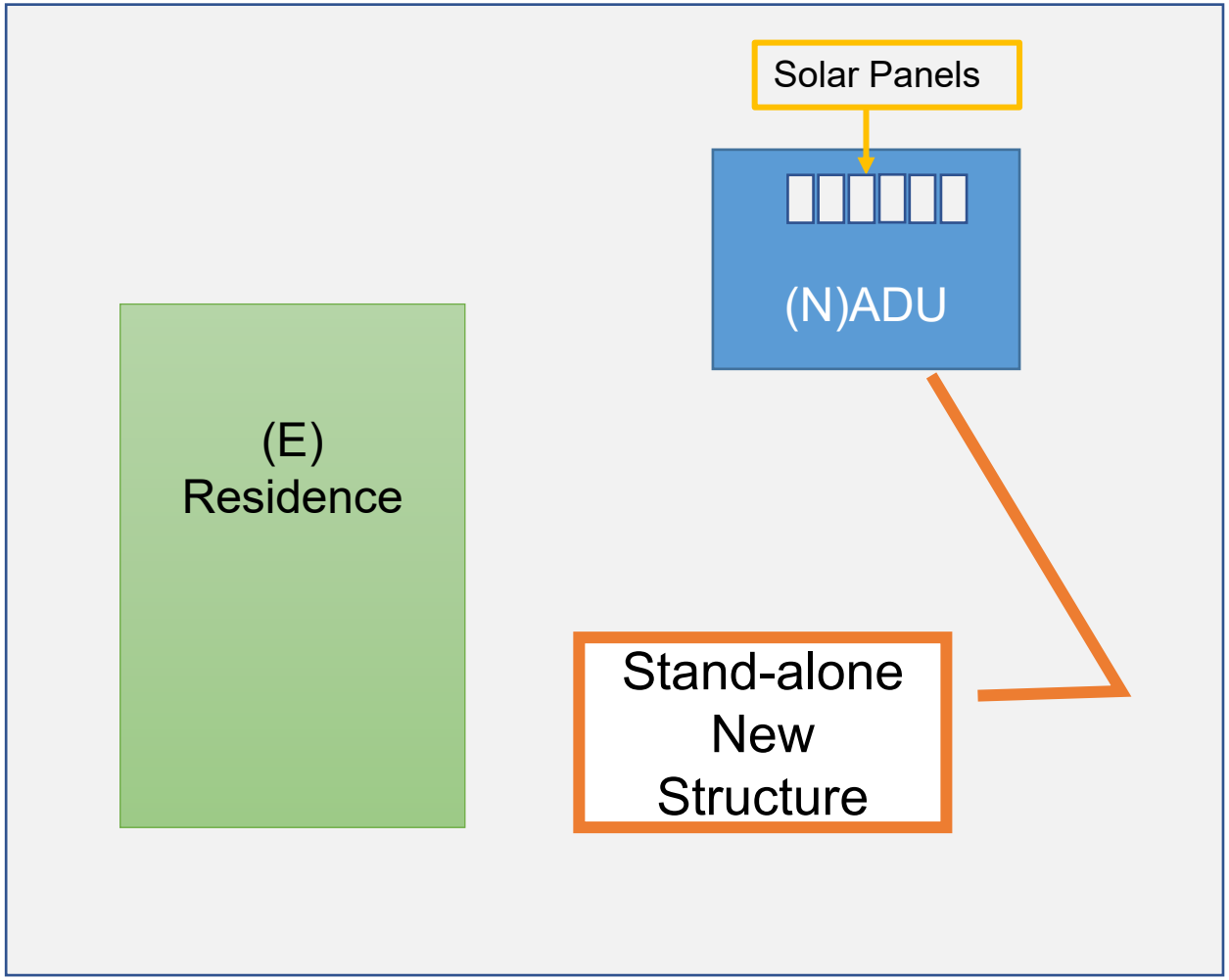
Image: City of Stockton, CA -- ADU Guide

Attached (Addition)



Images: City of Saint Paul, MN

New Construction: Stand Alone Structure under the Energy Code



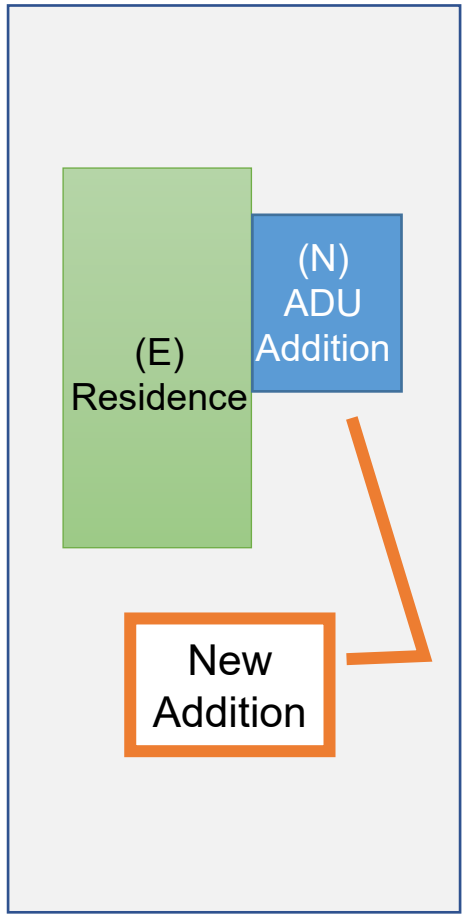
New Construction –Detached

Section 150.1 –New Construction – Low Rise Residential

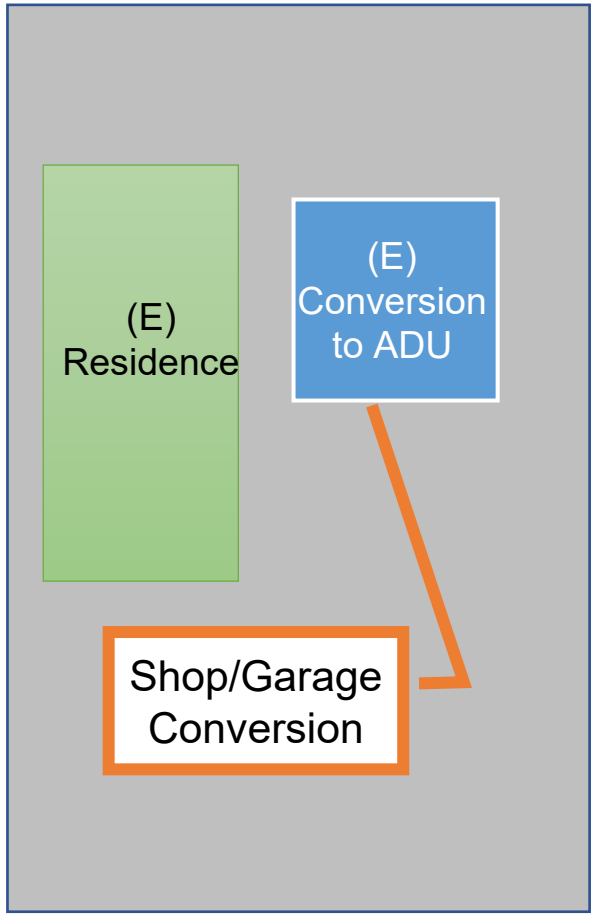
All subsections apply, including:

- Envelope (Walls, Roof, Floor, and Fenestration)
- Ventilation (IAQ –Indoor Air Quality),
- Mechanical Heating and Cooling
- DHW,
- Electric Ready
- Battery Storage Ready
- PV's (Solar Panels)

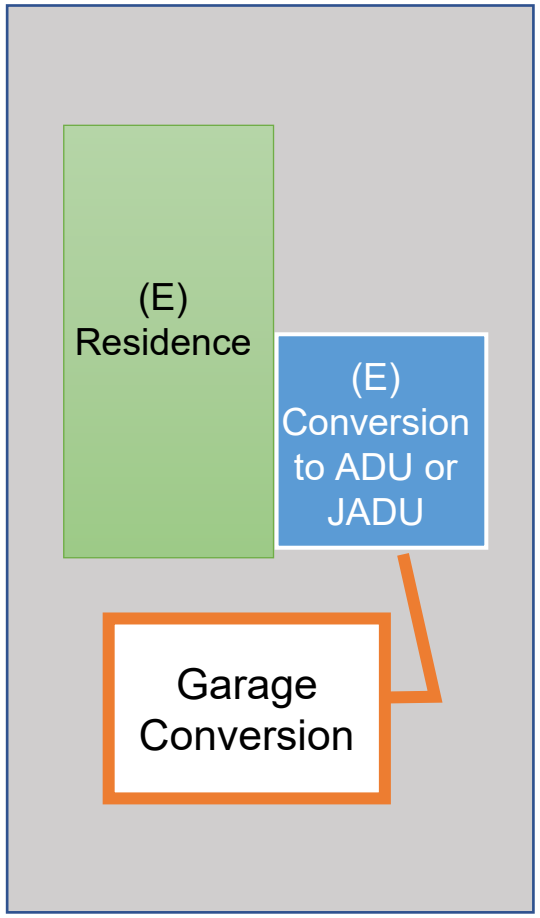
Additions: Three Scenarios under the Energy Code



Addition –Attached



Addition –Detached Conversion

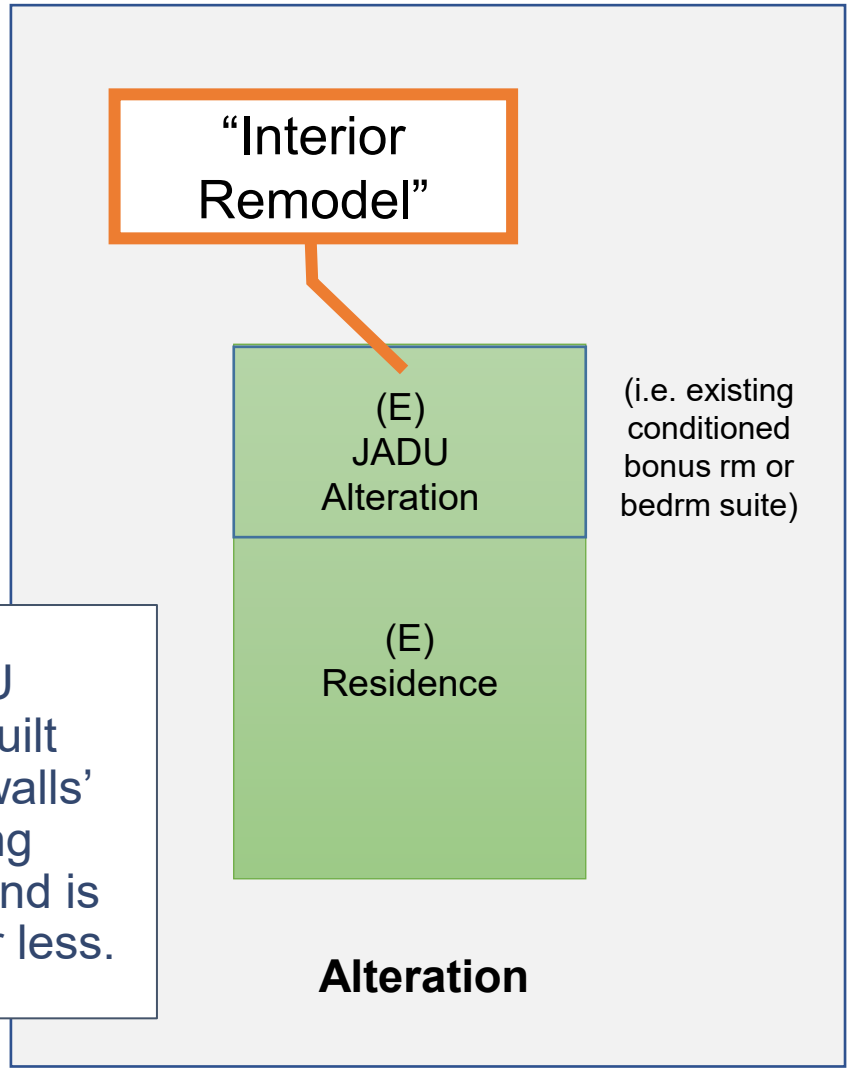


Addition –Attached Conversion

Section 150.2(a) –Additions

- Envelope (Walls, Roof, Floor, and Fenestration)
  - Wall Exceptions
  - Roofing Exceptions
- Ventilation (IAQ –Indoor Air Quality)
  - Bathroom, Kitchens, Floor Area
- Mechanical Heating and Cooling
  - ADU or JADU
- DHW
  - Adding second water heater
  - HPWH Ready

Alteration under the Energy Code: Does *not* Increase Conditioned Floor Area



*Junior ADU (JADU) is built within the 'walls' of an existing residence and is 500 sf. ft. or less.

Section 150.2(b) –Alterations

- Envelope (Walls, Roof, Floor, and Fenestration)
  - Wall Exceptions
  - Ceilings Alterations
- Ventilation (IAQ –Indoor Air Quality)
  - Bathroom, Kitchens, Floor Area
- Mechanical Heating and Cooling
  - Alterations and Duct Extensions
- DHW
  - Water Heater Replacement

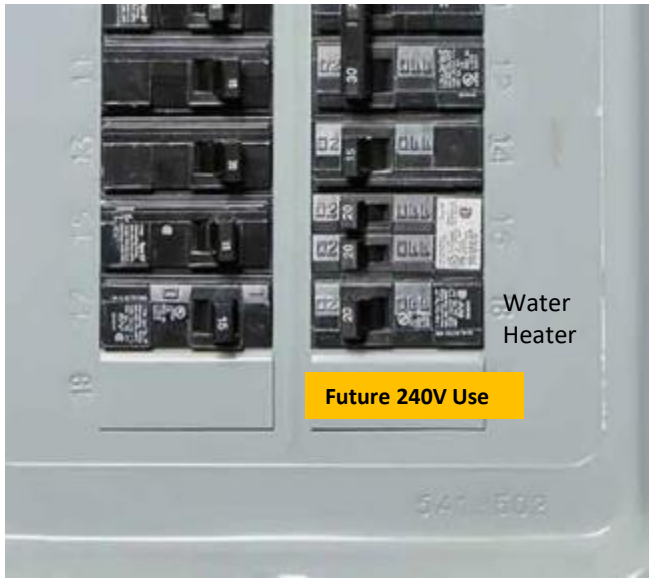
NEW CONSTRUCTION –

Electric Ready
PV (Solar Energy)
Battery Ready

"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



Solar Photovoltaic (PV) –New Construction

Prescriptive PV Sizing:

Equation 150.1-C Annual Photovoltaic Electrical Output

System Size kWPV = (CFA x A)/1000 + (N_{dwell} x B)

Where:

kW_{PV} = kW DC size of PV system

CFA = Conditioned Floor Area

A = CFA adjustment factor

N_{dwell} = Number of dwelling units (1 single, 2 duplex)

B = Dwelling adjustment factor

CZ	A	B
4	0.586	1.21
5	0.585	1.06
6	**0.594**	**1.23**
9	0.613	1.36

Example: 1000 sf ADU in CZ 6

kWpv = (1000 sf x 0.594)/1000 + 1(1.23) = 1.82 kW system

1.82 kW / 300 W panel = 6 panels

[each panel approx. 40”x67”]

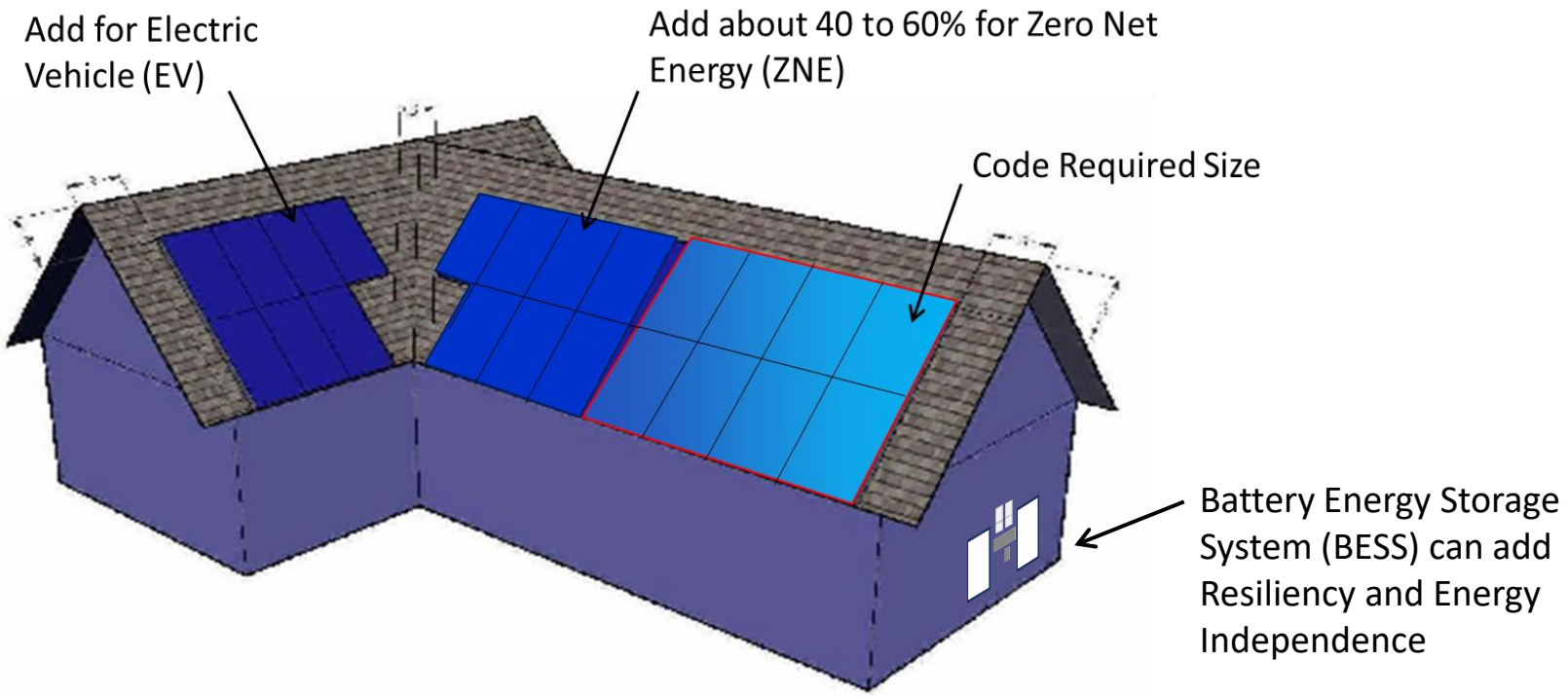
2025 Code Update

Exemptions:

- **PV not required, when kW_{PV} is less than 1.8 kW**
- **PV not required, when SARA is less than 80 sf**
- **PV size may be reduced by 25% if a cycling battery capacity of 7.5 kWh is installed**

PV system size:
The lesser of Equation 150.1-C or 14W x SARA for low-sloped roofs or 18W x SARA for steep sloped roofs

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:

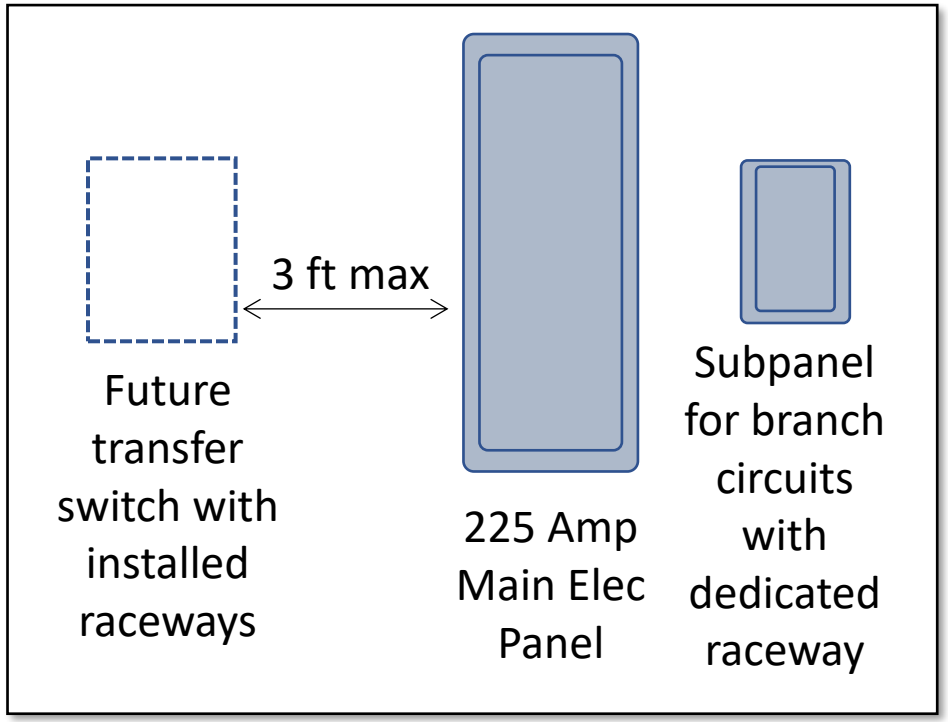
SELF-UTILIZATION CREDIT is the limited Efficiency LSC energy budget compliance credit available for combined PV and battery energy storage systems for single-family, as specified by the Residential ACM Reference Manual, and low-rise multifamily, as specified by the Nonresidential and Multifamily ACM Reference Manual.

Performance pathway:

- Min Battery Size of 5 kWh
- Needs to interface with the 'Grid'

“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.

NEW CONSTRUCTION –
Roofs, Walls and Fenestration

ADDITIONS –Wall Extensions

ALTERATIONS –
Walls and Fenestration

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 above Grade:

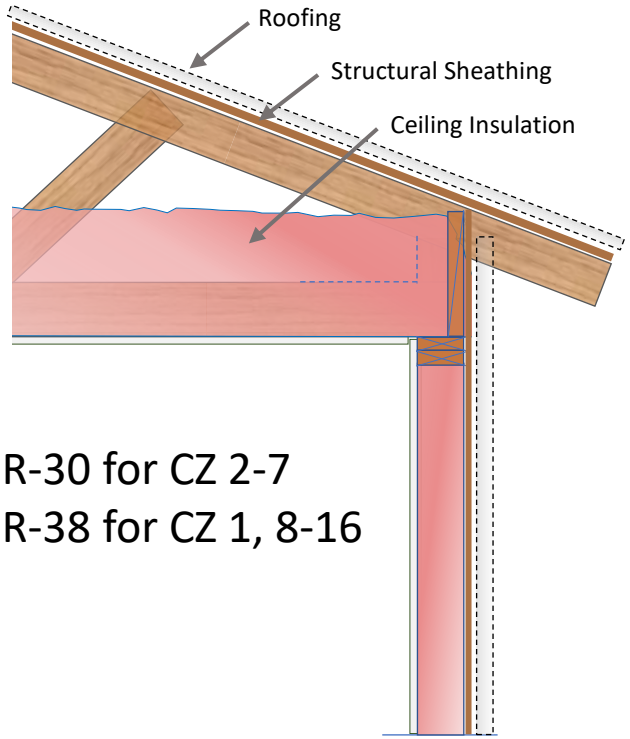
- Max. U-factor U-0.102
- [Roughly equal to R-10]

Mass Walls above Grade:

- Follow Prescriptive Table 150.1-A

Prescriptive Options: Vented Attics and Cathedral Roof Assemblies with *Ducts in Conditioned Space*

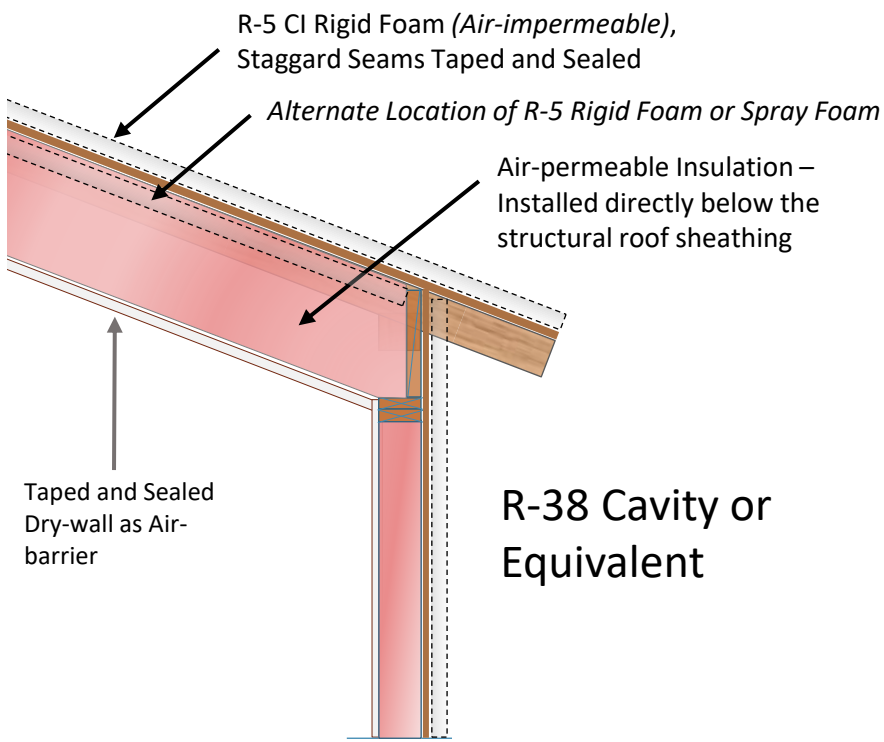
Climate Zones (CZ) 8, 9, and 10 got an upgrade to R-38



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

Vented Attic with Ceiling Insulation

New Prescriptive Option:
All Climate Zones are R-38



R-38 Cavity or Equivalent

Unvented Cathedral / Rafter Roof (Option C)

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 Res Code Part 2.5

TABLE 150.1-A COMPONENT PACKAGE – Single-Family Standard Building Design (Continued)

Building Component Roofs and Ceilings Walls, Floors, Doors, Fenestrations, and QII	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
Above Grade Framed Walls[3]	U-0.048	U-0.048	U-0.048	U-0.048	U-0.048	U-0.065	U-0.065	U-0.048	U-0.048	U-0.048	U-0.048	U-0.048	U-0.048	U-0.048	U-0.048	U-0.048
Above Grade Masonry/ Mass Wall Interior[4,5,6]	U-0.077	U-0.077	U-0.077	U-0.077	U-0.077	U-0.077	U-0.077	U-0.077	U-0.077	U-0.077	U-0.077	U-0.077	U-0.077	U-0.077	U-0.077	U-0.059
	R-13	R-13	R-13	R-13	R-13	R-13	R-13	R-13	R-13	R-13	R-13	R-13	R-13	R-13	R-13	R-17
Above Grade Masonry/ Mass Wall Exterior[4,5,6]	U-0.125	U-0.125	U-0.125	U-0.125	U-0.125	U-0.125	U-0.125	U-0.125	U-0.125	U-0.125	U-0.125	U-0.125	U-0.125	U-0.125	U-0.125	U-0.100
	R-8.0	R-8.0	R-8.0	R-8.0	R-8.0	R-8.0	R-8.0	R-8.0	R-8.0	R-8.0	R-8.0	R-8.0	R-8.0	R-8.0	R-8.0	R-13
Below Grade Interior Walls[7]	U-0.077	U-0.077	U-0.077	U-0.077	U-0.077	U-0.077	U-0.077	U-0.077	U-0.077	U-0.077	U-0.077	U-0.077	U-0.077	U-0.077	U-0.077	U-0.067
	R-13	R-13	R-13	R-13	R-13	R-13	R-13	R-13	R-13	R-13	R-13	R-13	R-13	R-13	R-13	R-15
Below Grade Exterior Walls[7]	U-0.200	U-0.200	U-0.200	U-0.200	U-0.200	U-0.200	U-0.200	U-0.200	U-0.200	U-0.200	U-0.200	U-0.200	U-0.200	U-0.100	U-0.100	U-0.053
	R-5.0	R-5.0	R-5.0	R-5.0	R-5.0	R-5.0	R-5.0	R-5.0	R-5.0	R-5.0	R-5.0	R-5.0	R-5.0	R-10	R-10	R-19
Slab Perimeter Floors	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	F-0.58

3. Assembly U-factors for exterior framed walls can be met with cavity insulation alone or with continuous insulation alone, or with both cavity and continuous insulation that results in an assembly U-factor equal to or less than the U-factor shown. Use Reference Joint Appendices JA4 Table 4.3.1, 4.3.1(a), or Table 4.3.4 to determine alternative insulation products to be less than or equal to the required maximum U-factor.
4. Mass wall has a heat capacity greater than or equal to 7.0 Btu/h-ft^2. "
5. "Interior" denotes insulation installed on the inside surface of the wall. "Exterior" denotes insulation installed on the exterior surface of the wall.
6. Below grade "interior" denotes insulation installed on the inside surface of the wall, and below grade "exterior" denotes insulation installed on the outside surface of the wall.

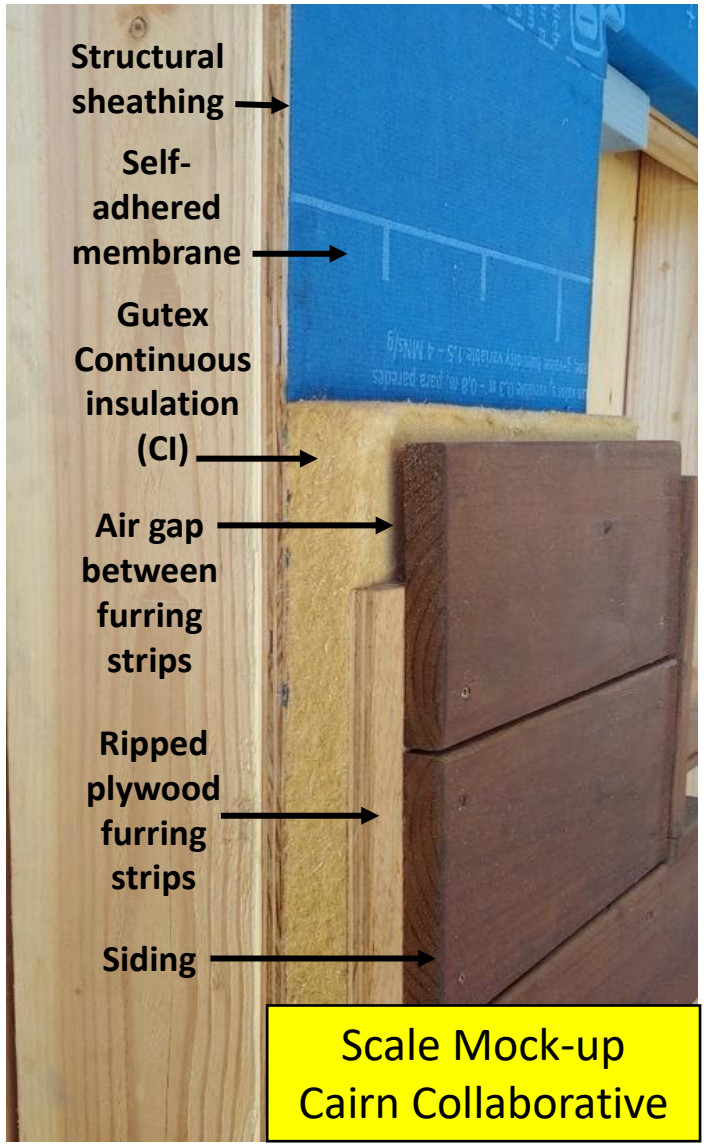
Walls Assemblies Meeting Prescriptive U-0.065 and U-0.048

Table 3-10: Examples of Wood-Framed Wall Assemblies and U-Factors, Assuming Gypsum Board Interior

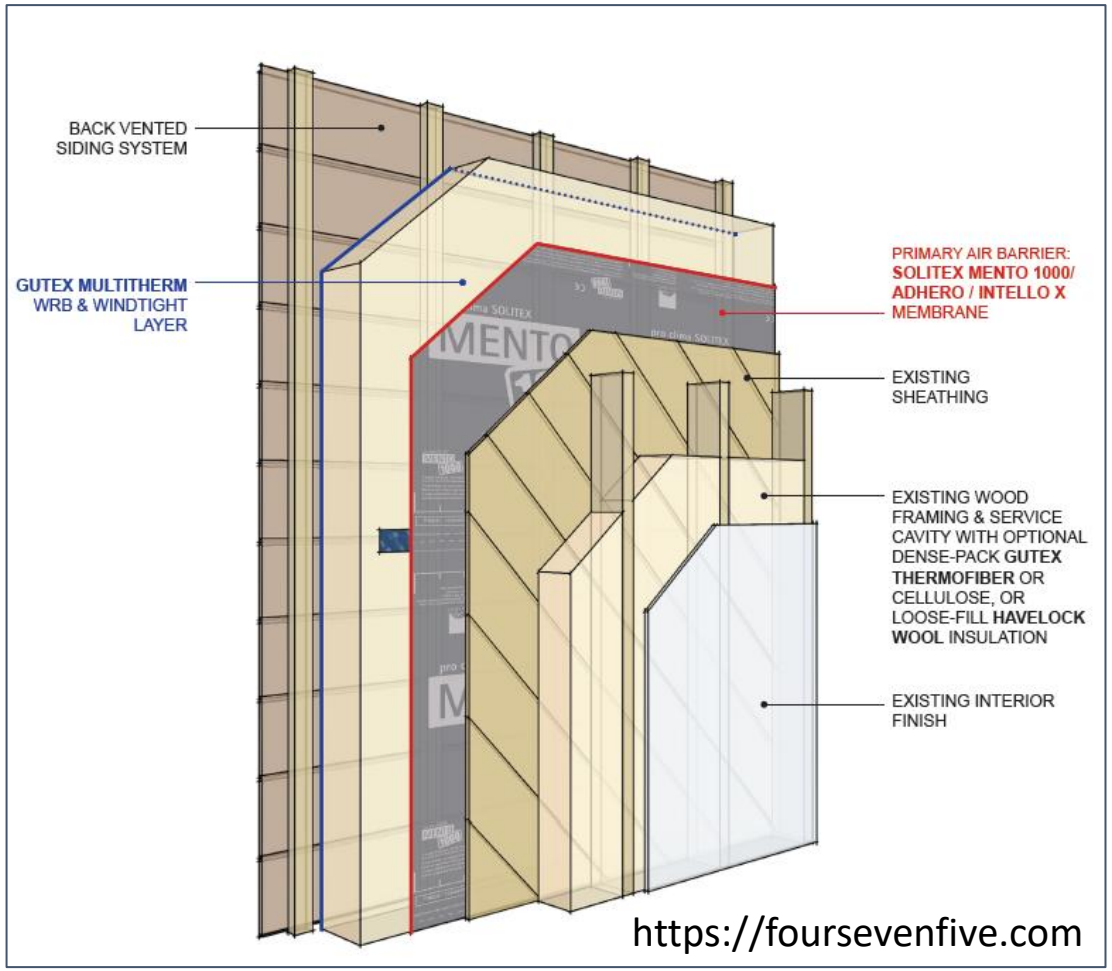
Stud (16" oc)	Cavity Insulation	Cavity Insulation Type	Exterior Insulation	U-Factor	
2x4	R15	High density batt	R4	0.065	CZ 6,7
2x4	R13	Open-cell spray foam (ocSPF)	R5	0.064	
2x4	R15	High density batt	R8	0.050	
2x6	R21	Loose-fill cellulose or high density batt	R4	0.051	
2x6	R19	Low density batt	R5	0.051	
2x6	R31	Closed-cell spray foam (ccSPF)	R2	0.049	
2x6	R23	High density batt or mineral wool	R4	0.049	
2x6	R21	Loose-fill cellulose or high density batt	R5	0.048	CZ 1-5 CZ 8-16
2x6	R19	Low density batt	R6	0.048	
2x6	R23	High density bat or mineral wool	R5	0.047	

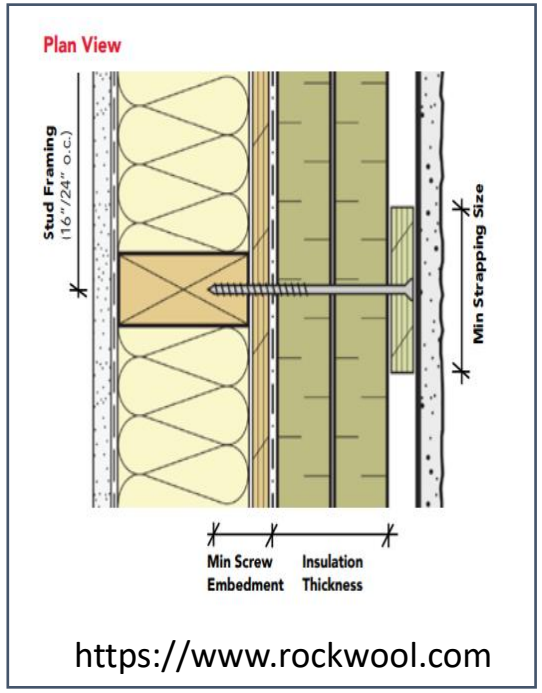
Note: Under the Performance Method projects will have to find trade-off credit to remove the CI.

Wall Assemblies with Continuous Insulation (CI)



Scale Mock-up
Cairn Collaborative

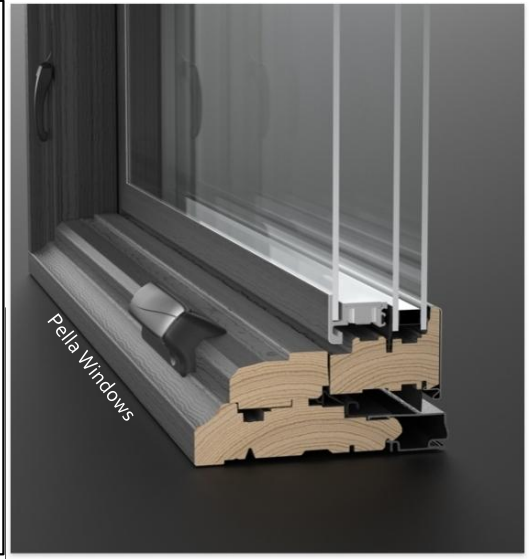




Example of layered wall assembly looking from interior to exterior

Window U-factor Updates for 2025

Just about all brands of windows offer dual or triple paned options



Options:

- Dual Paned Low-e
- Triple paned Low-e
- Air/Argon/Krypton
- Thermally Broken
- Visible Transmittance
- Sound Transfer

Note:
Many 20-min Fire-Rated Windows have U-factors around U-0.42

Mandatory:

- **U-0.40** (decrease from U-0.45 max)

Prescriptive:

- **U-0.27** decrease for CZ 1-5, 11-14, 16
- **U-0.30** no change for CZ 6-10, 15

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**.

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.

Fenestration and Doors

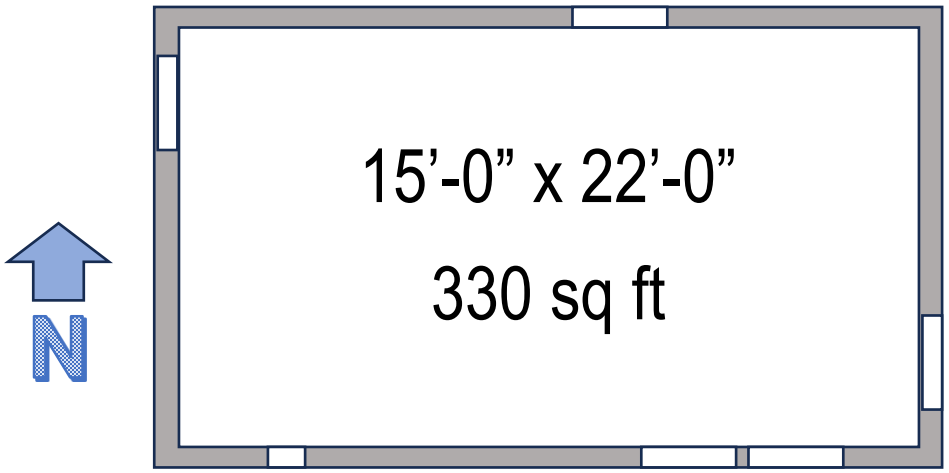
RED – 2025 Code update

TABLE 150.1-A COMPONENT PACKAGE – Single- Family Standard Building Design (continued)

		Climate Zone															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Fenestration	Maximum U-factor	0.27	0.27	0.27	0.27	0.27	0.30	0.30	0.30	0.30	0.30	0.27	0.27	0.27	0.27	0.30	0.27
	Maximum SHGC	NR	0.23	NR	0.23	NR	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.20	NR
	Maximum Total Area	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
	Maximum West Facing Area	NR	5%	NR	5%	NR	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	NR
Door	Maximum U-factor	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	0.20	0.20

NR = Not Required
Fenestration Ratio (%) = Window Area to Conditioned Floor Area (CFA)

Prescriptive Example for Window Area:



Example of Prescriptive Solution:

(3) 3.5x5 windows = 52.5 sq ft
(1) 3x3 window = 9 sq ft
(1) 3x1 window = 3 sq ft
(1) 1x1 window = 1 sq ft

Total Area = 65.5 sq ft

For all climate zones, 20% Win/Flr Ratio:

330 sq ft x 20% = **66 sq ft total allowable**

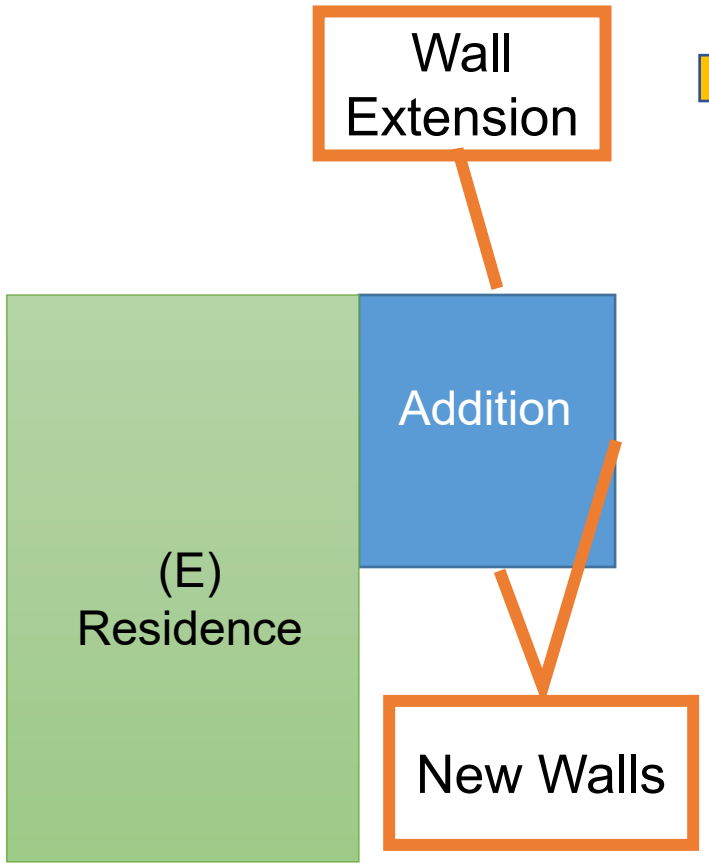
For CZ 2, 4, and 6-15, up to 5% west-facing Win/Flr Ratio

330 sq ft x 5% = **16.5 sq ft west-facing allowable**

Performance Method Trade-Offs:

Can use the Performance Method to gain more windows and/or avoid continuous insulation…

Additions –Wall Extensions and Existing Framed Walls



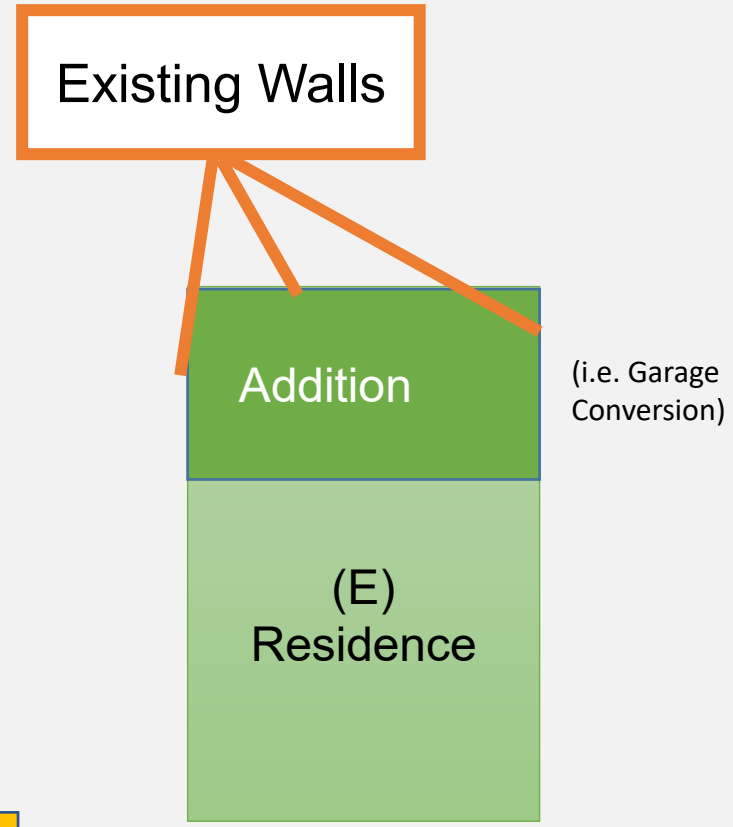
Addition with a Wall Extension

Extensions of existing wood-framed walls may retain the dimensions of the existing walls

- R-15 in a 2×4
- R-21 in a 2×6
- **Continuous insulation (CI) *not* required**

When existing siding of a wood-framed wall is *not being removed or replaced*:

- R-15 in a 2x4 framing
- R-21 in a 2x6 framing
- **CI *not* required**



(i.e. Garage Conversion)

Addition –Attached Conversion

Wall Extension –Where a (N) Wall *aligns* with an (E) Wall

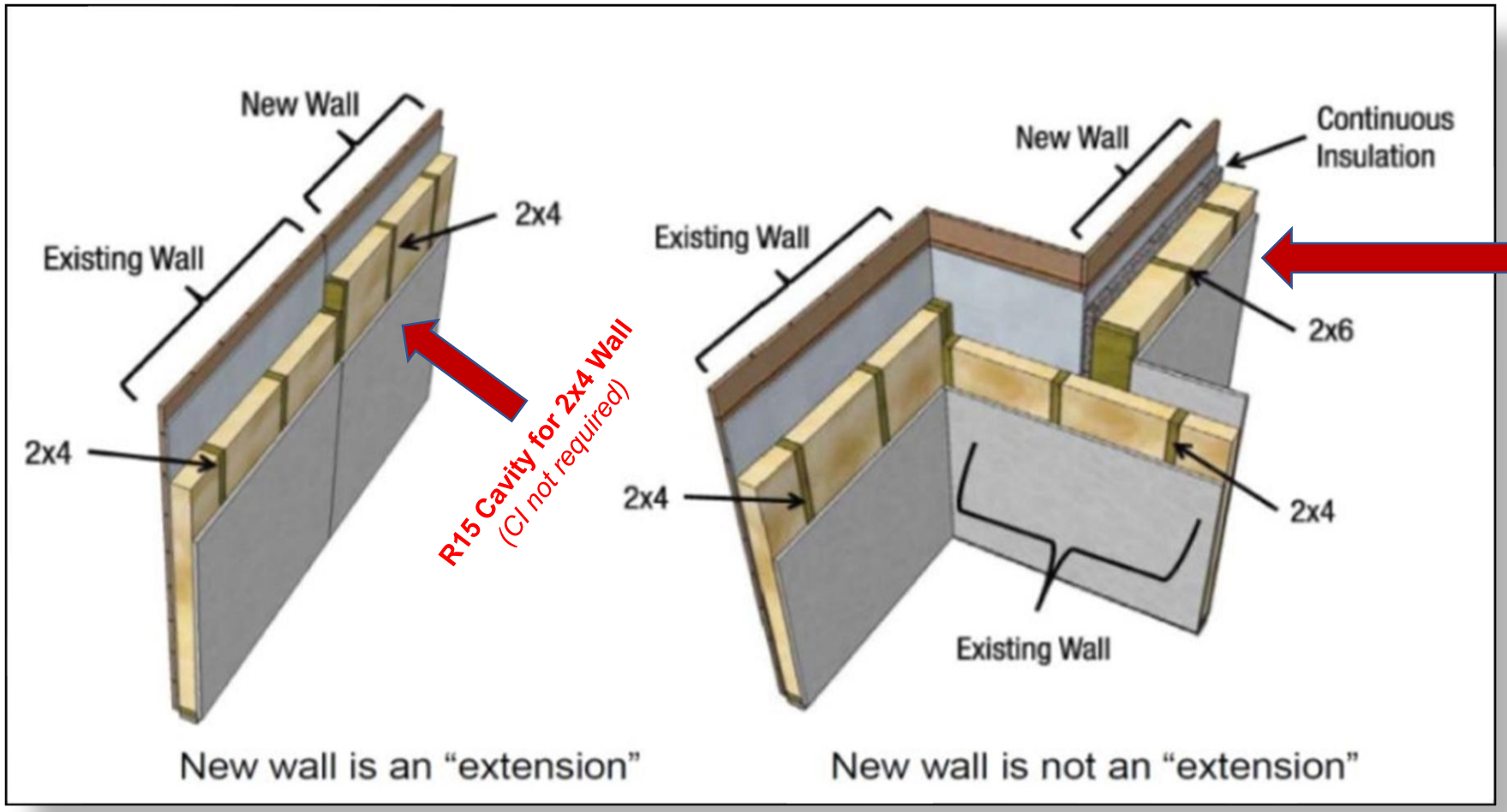


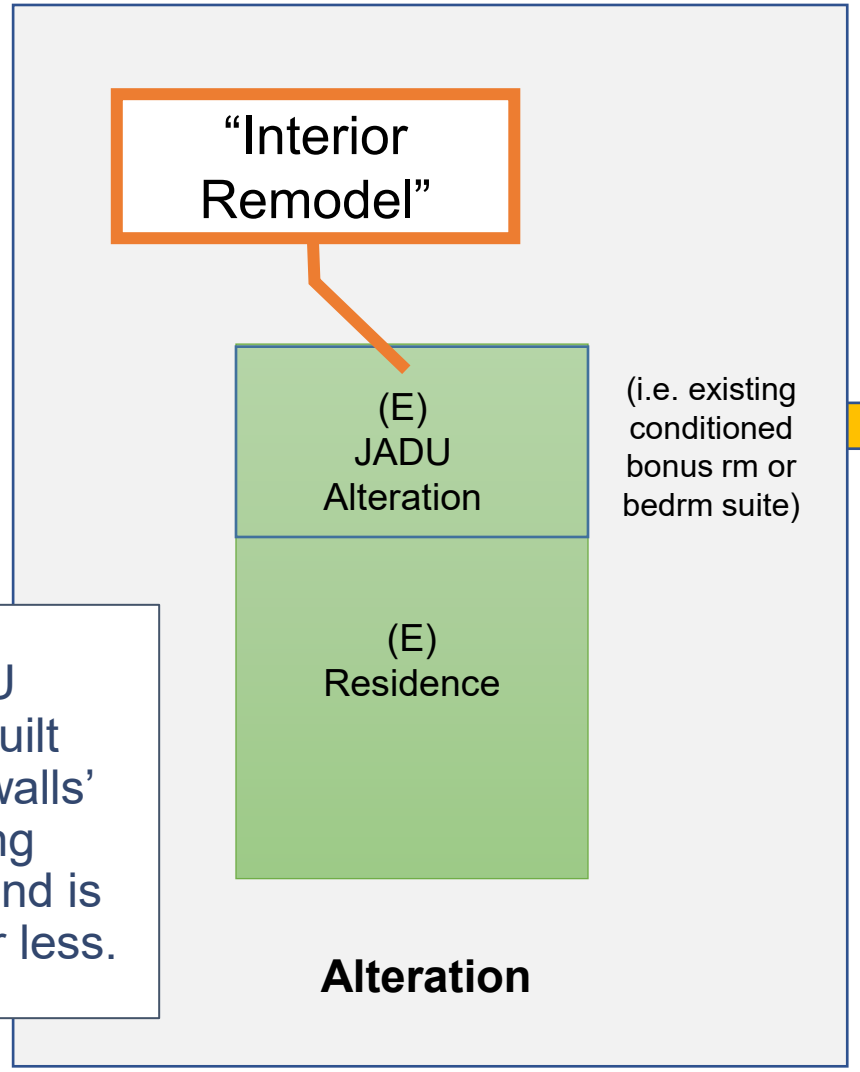
Image from CEC's BluePrint

Continuous Insulation (CI) is required Prescriptively.

This could be a cavity filled R-21 batt with R-5 continuous. (U- 0.048)

Wall Extension: R-15 for 2x4 walls and R-21 for 2x6 walls

Alterations –Existing Walls and Wall Alterations



(i.e. existing conditioned bonus rm or bedrm suite)

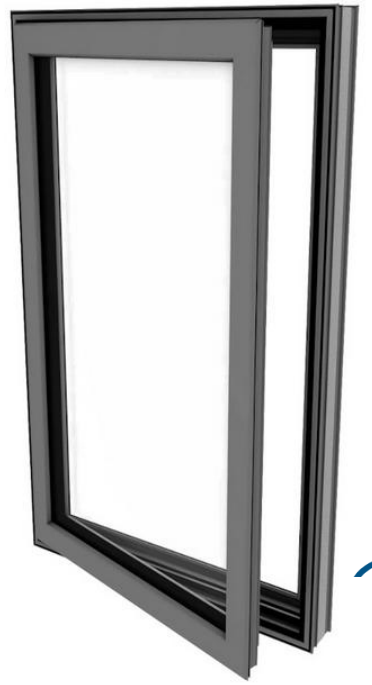
Walls being Altered:

- Equiv R-15 in a 2x4 framing
- Equiv R-21 in a 2x6 framing
- Exception existing walls with R-11

*Junior ADU (JADU) is built within the ‘walls’ of an existing residence and is 500 sf. ft. or less.

Fenestration Alterations –i.e. added and replaced windows and skylights

CZ 1, 3, 5, 16	2025 Code	
Fenestration (Windows and Skylights)	**U-factor**	**SHGC**
Window Replacement 75 sq ft or less	0.40	NR
Skylight Replacement	0.40	0.30
Window Replacement > 75 sq ft or **New Additional Fenestration**	0.27	NR
Total Glazing as a % of Floor Area	20%	
West Facing Glazing	NR	



Models with U-factors as low as U-0.12 are available

ALPEN

EXCEPTION:
Alterations that add up to **16 square feet of new fenestration or skylight** shall not be required to meet the total fenestration area and west-facing fenestration area requirements.

Fenestration Alterations –i.e. added and replaced windows and skylights

CZ 6-10, 15	2025 Code		
Fenestration (Windows and Skylights)	U-factor	SHGC	
		CZ 6-10	CZ 15
Window Replacement 75 sq ft or less	0.40	0.35	0.23
Skylight Replacement	0.40	0.30	0.30
Window Replacement > 75 sq ft or **New Additional Fenestration**	0.30	0.23	0.23
Total Glazing as a % of Floor Area	20%		
West Facing Glazing	5%		

CZ 2, 4, 11-14	2025 Code	
Fenestration (Windows and Skylights)	U-factor	SHGC
Window Replacement 75 sq ft or less	0.40	0.35
Skylight Replacement	0.40	0.30
Window Replacement > 75 sq ft or **New Additional Fenestration**	0.27	0.23
Total Glazing as a % of Floor Area	20%	
West Facing Glazing	5%	

EXCEPTION:
Alterations that add up to **16 square feet of new fenestration or skylight** shall not be required to meet the total fenestration area and west-facing fenestration area requirements.

Wall Summary Performance Method 'Baseline' for Additions and Alterations

Based on Table 29: Standard Design for Walls and Doors
Source: California Energy Commission, ACM Manual 2025 Code

Proposed Design Exterior Wall Assembly Type	Addition	Altered
Framed & Non-Mass Exterior Walls	CZ 1-5, 8-16 = R-21+R-5 in 2x6 (U0.048) CZ 6-7 = R-15+R-4 in 2x4 (U-0.065)	R-15 in 2x4 R-21 in 2x6
Wood Framed Existing Walls where **siding is not removed, or an extension** of an existing wall	R-15 in 2x4 R-21 in 2x6	R-15 in 2x4 R-21 in 2x6
Framed Wall Adjacent to Unconditioned (e.g., Demising or Garage Wall)	R-15 in 2x4 R-21 in 2x6	R-15 in 2x4 R-21 in 2x6
Above Grade Mass Interior Insulated	CZ 1-15 = R-13 (0.077) CZ 16 = R-17 (0.059)	N/R Mandatory requirements have no insulation for mass walls
Below Grade Mass Interior Insulation	CZ 1-15 = R-13 (0.077) CZ 16 = R-15 (0.067)	N/R Mandatory requirements have no insulation for mass walls

Domestic Hot Water

Water Heaters – Prescriptive 2025 Update

New Construction:

- A **240V heat pump water heater*** –CZ 2-15; additional requirements apply for CZ 1 and 16.
- A **120V HPWH** may be installed in place of a 240V HPWH for **new dwelling unit with 1 bedroom or less.**
- ~~A **gas or propane instantaneous*** water heater with an input of 200 kBtu/h or smaller – CZ 3, 4, 13 and 14~~

~~*Allowable for Additions in any climate zone~~

Key Take Away: Under 2025 code, use the Performance Method for gas/LP water heaters.

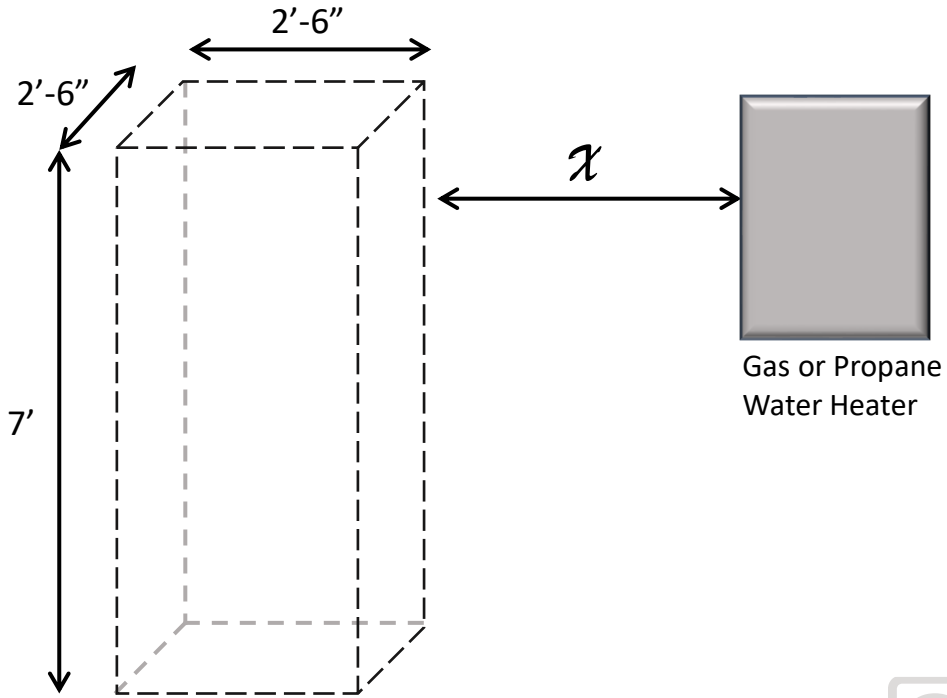
New Construction and Additions
500 sq ft or less

- An ~~**instantaneous**~~ **electric water heater** with ***point of use distribution*** as specified in RA4.4.5 is allowable

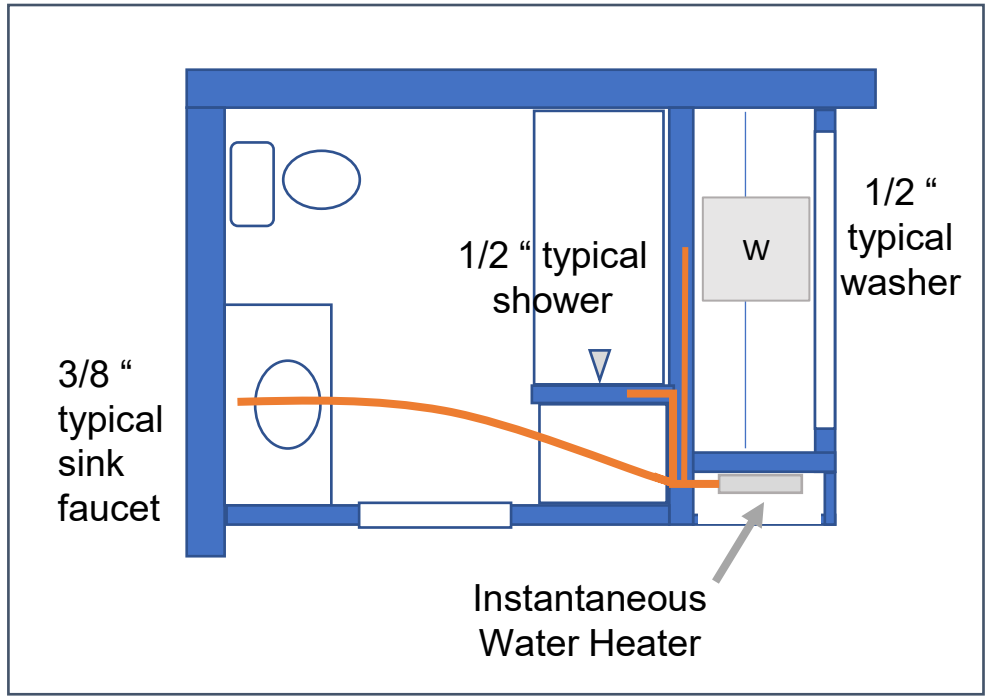
Heat Pump Water Heater (HPWH) Ready

–triggered when installing a gas or propane water heater in *new construction*

- Dedicated space for future HPWH: **30” x 30” x 7**’
- All electrical components shall be installed in accordance with the ***California Electrical Code***.
- Specific electrical and plumbing requirements depend on **relative location** to the gas or propane **water heater**, i.e. when x is greater than 3 ft or equal to or less than 3 ft.



Point of Use (POU) –*Requirement* for ELEC TANKLESS



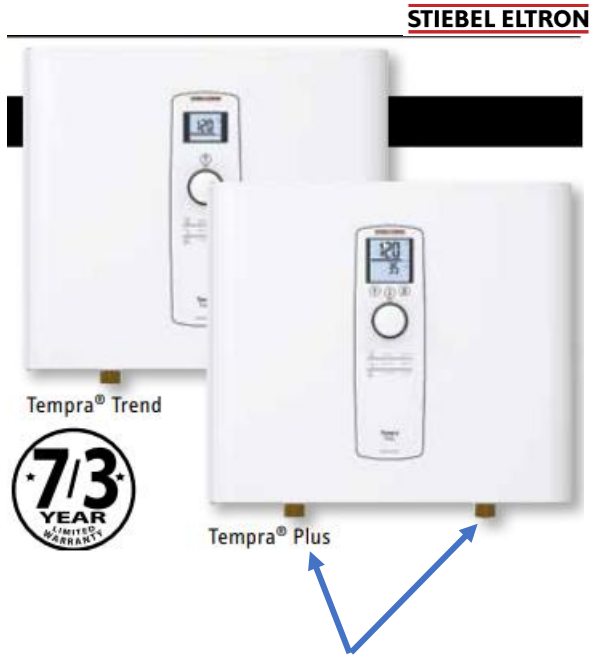
POU - Point of Use Distribution

Table 4.4.5

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

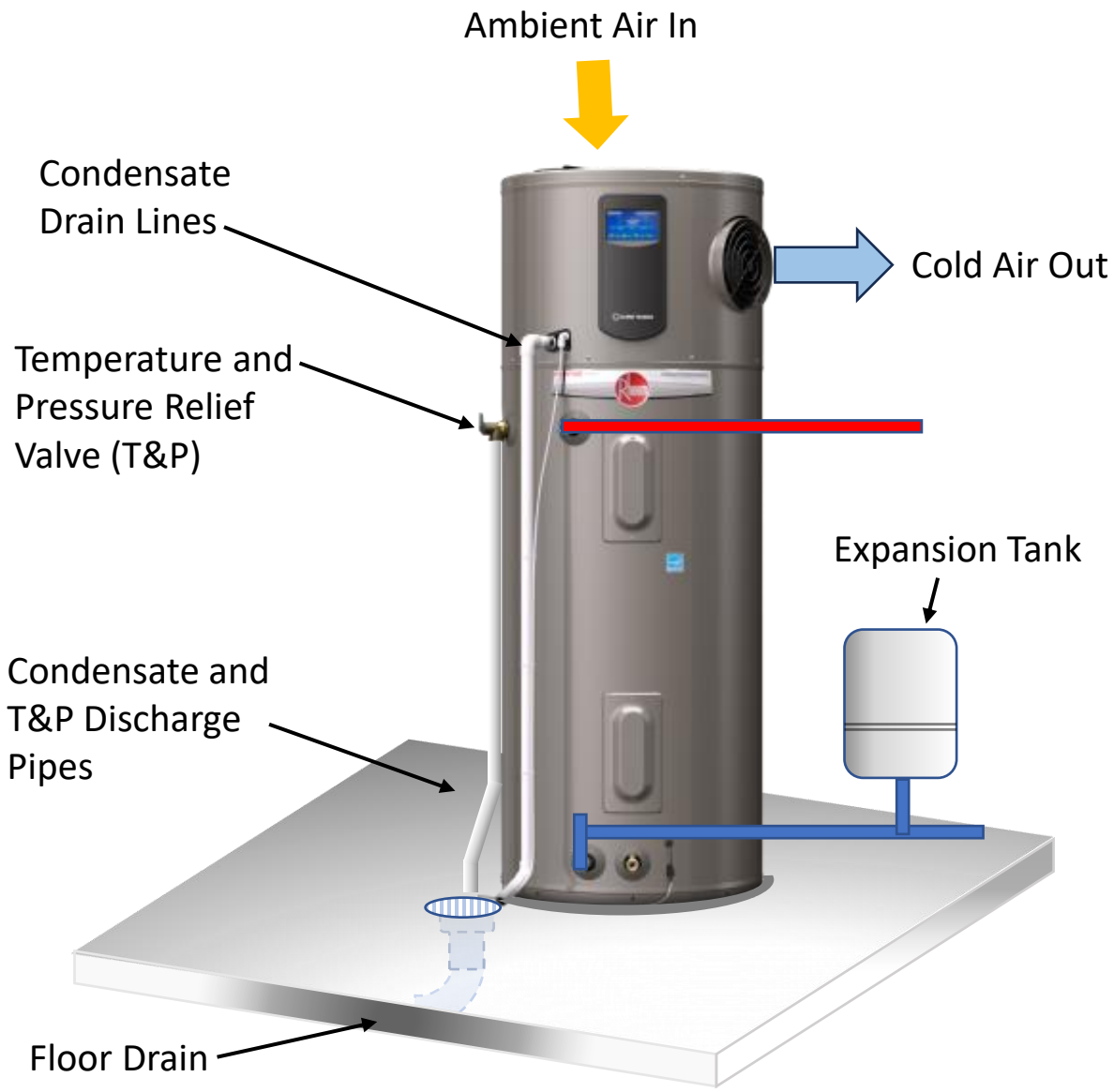
Line size vs Length for each run

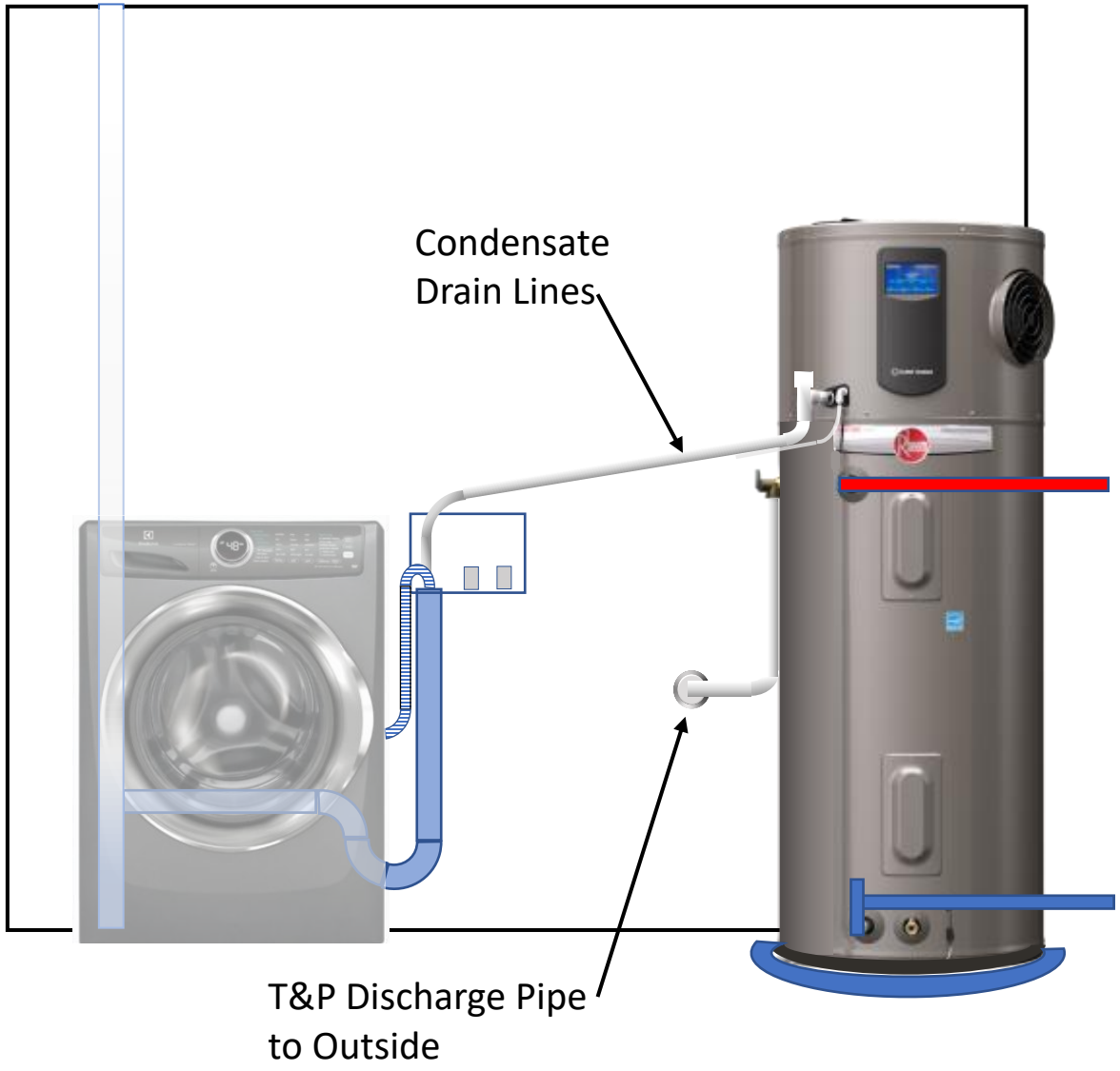
Take most direct path with truck-branch line. If two pipe sizes are used in a single run, half the length of pipe shall be considered for each pipe size.



¾" lines connection typical

Integrated Heat Pump Water Heater (also known as a Hybrid Water Heater)



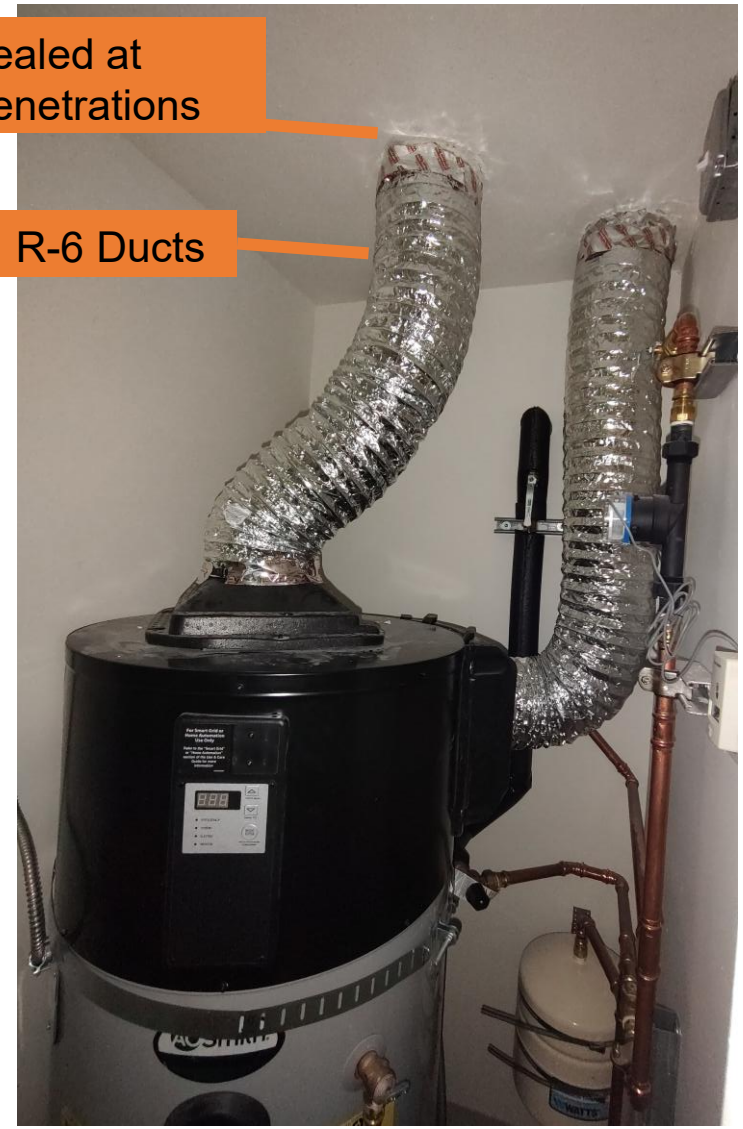


2025 Code –New Mandatory Requirements for HPWH

Mandatory - Section 110.3

Installation Space 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…"

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



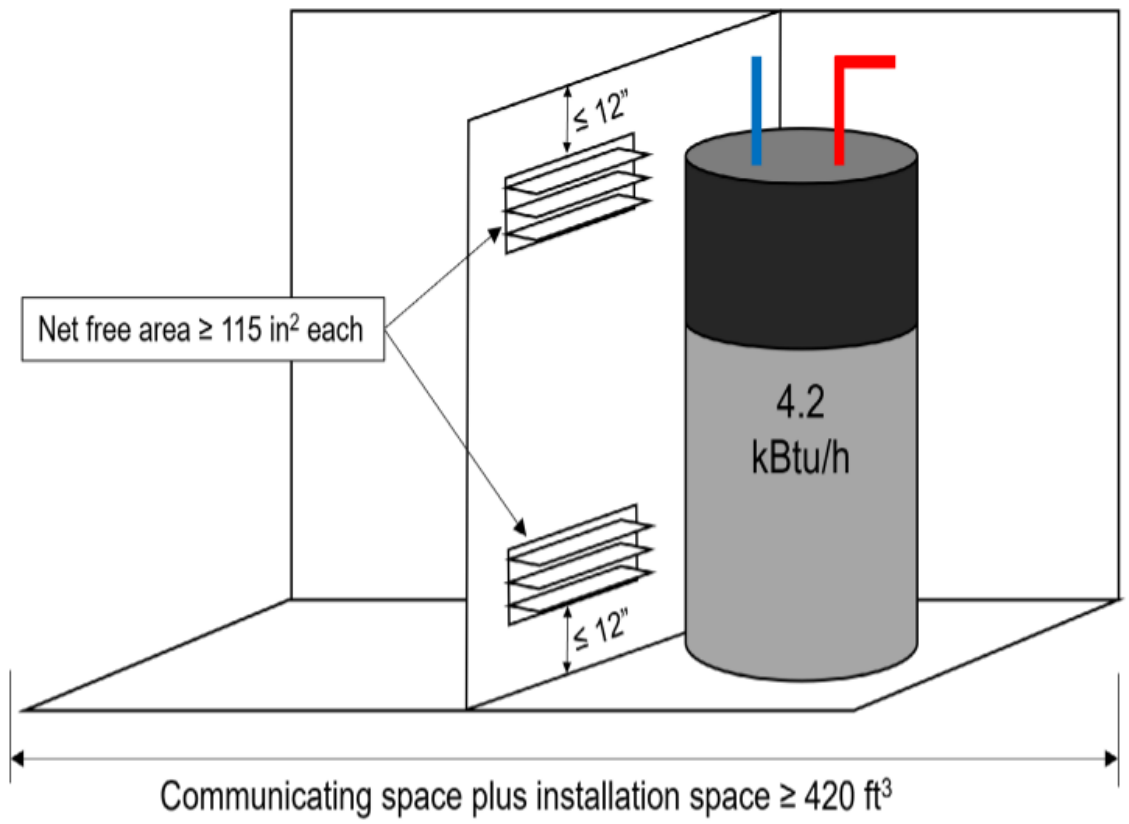
Note:
4200 Btu/h or 4.2 kBtu/h compressor capacity is common for many residential integrated heat pump units (typ. 40-80 gal)

Clarifying Diagram Published by CEC

Water Heating

- Updates requirements for backup heat in heat pump water heaters (HPWH) with unconditioned inlet air, unless compressor cutoff temperature below local Heating Winter Median of Extremes. Section 110.3(c)7A
- Adds ventilation or minimum room volume required when installing HPWH (Figure 1). Section 110.3(c)7B
- Updates mandatory requirement for a future HPWH conductor to be a minimum 30A branch circuit. Section 150.0(n)1Ai

Figure 1: Example of HPWH ventilation per Section 110.3(c)7B3



Source: energy.ca.gov/newsroom/blueprint-newsletter

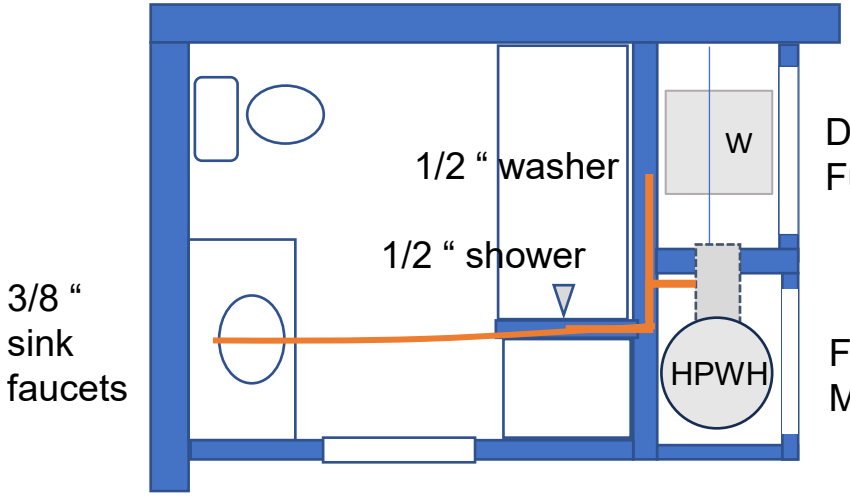
Math Help:

Volume Total (ft^3)
= 100 x cap
= 100 x 4.2 kBtu/h
= 420 ft^3

Note:
Many manuf. specify more vol. than 100 x cap.

NFA total (in^2)
= 125 in^2 + (25 in^2 x cap)
= 125 + (25 x 4.2)
= 125 + 105
= 230 in^2
Each vent = 230 / 2
= 115 in^2

Example: HPWH Located Indoors with a Point of Use (POU) Performance-Method Credit



HPWH Located Indoors, and with Air-Inlet Indoors and Air-Outlet Indoors

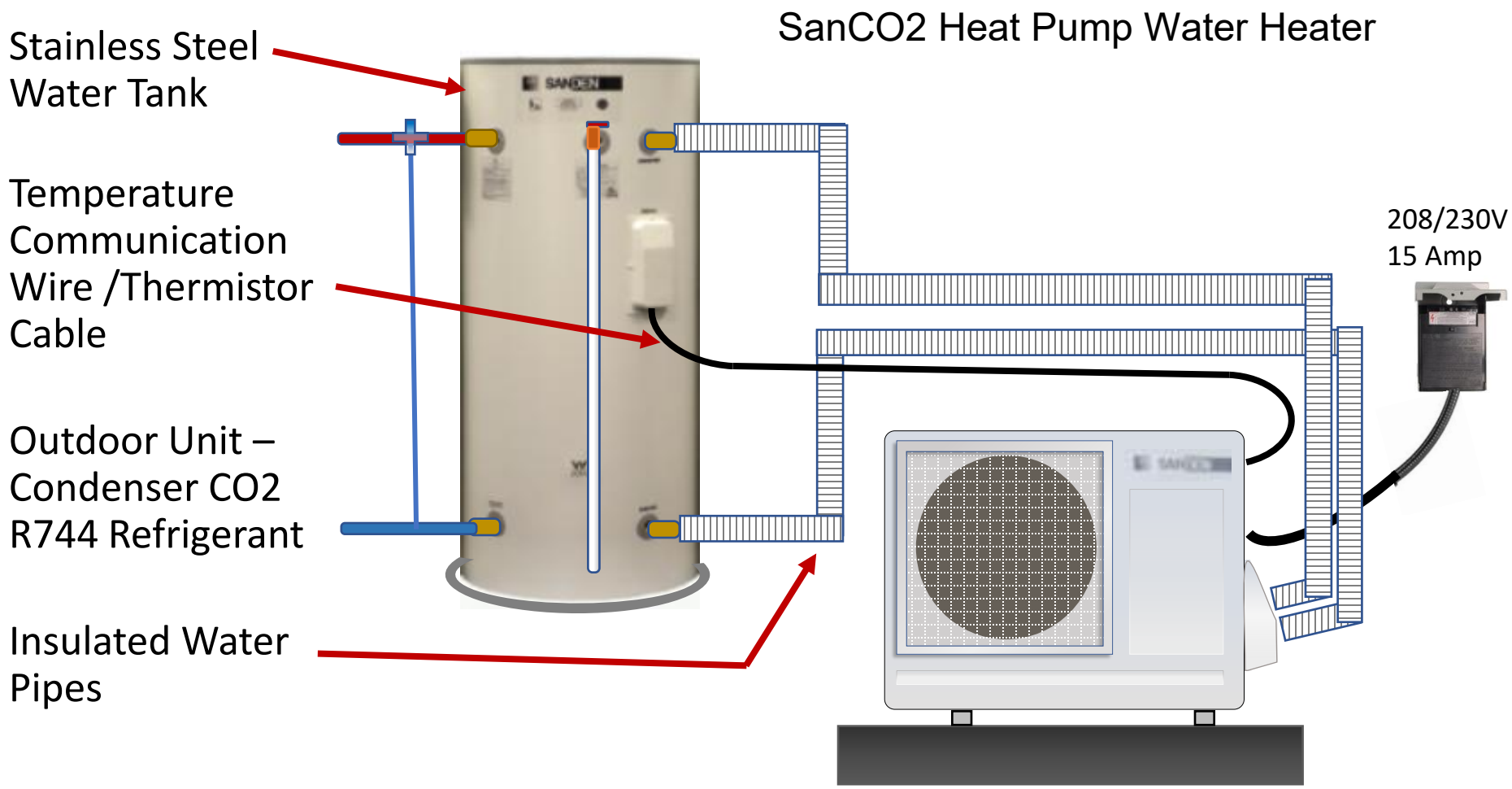
Installation Tips:

- Look for HPWHs with lowest sound ratings
- Use app to schedule HPWH operation during the daytime
- Install with flexible piping at the water heater to isolate vibration
- Use flexible seismic straps or have sound/vibration isolation connectors
- Avoid locating along or behind a sleeping/bed wall

Side Bar:
With Wildland-Urban Interface (WUI) areas expanding, we are seeing the potential need to locate the HPWH within the envelope, which meets T24 Part 7, i.e. non-combustible siding, solid exterior doors, fire rated windows, and screen ventilation, etc.

Example: Split System Heat Pump Water Heater

Tank shall be located indoors, and the condenser outdoors



Interior Closet Location

Image Source: eco2waterheater.com

Heat Pumps for Space Conditioning

Additions – both JADU's and Attached ADU's

Space heating system: New or replacement space heating system serving an addition may be a **heat pump** or **gas heating** system.

2025 Code – all climate zones (CZ)

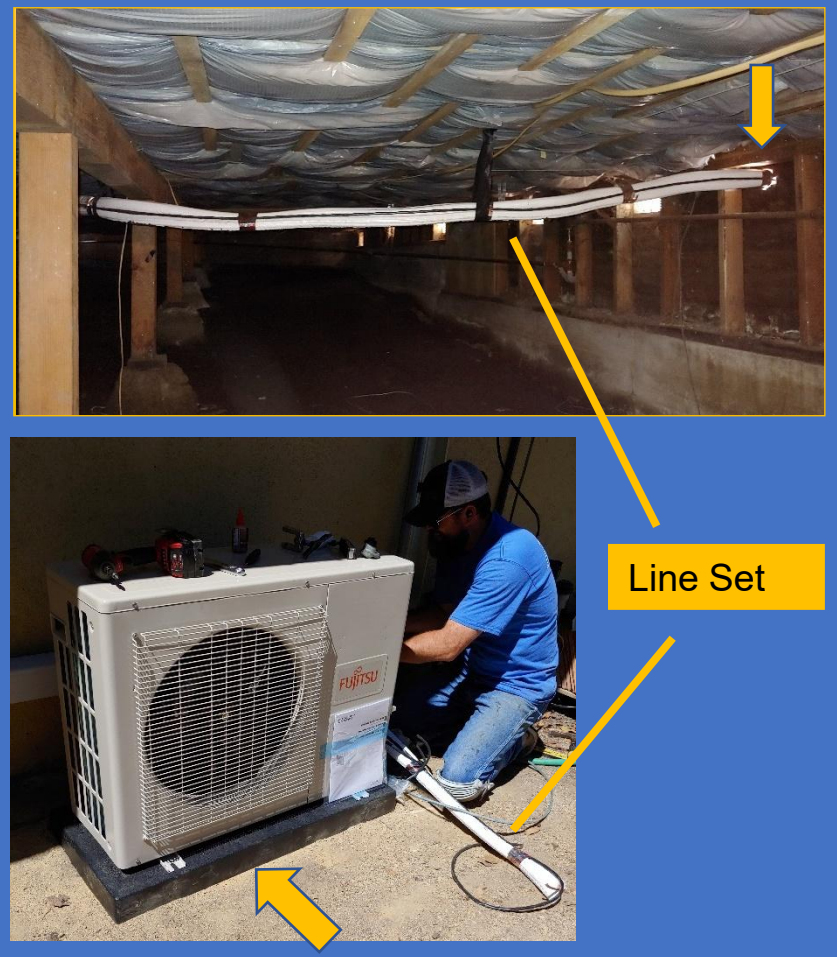
Reminder: For **New Construction** ~~(CZ 3, 4, 13, and 14)~~ heat pumps (HP) for space heating are Prescriptively required, but under the Performance pathway HP and/or Gas Furnaces are allowable.

Important Reminders –Heating and Cooling for ADU's

- ADU's may ***not share return air with the primary dwelling*** through the heating or cooling system.
- **Separate thermostats** are required

Mini-Split Raised Floor Example

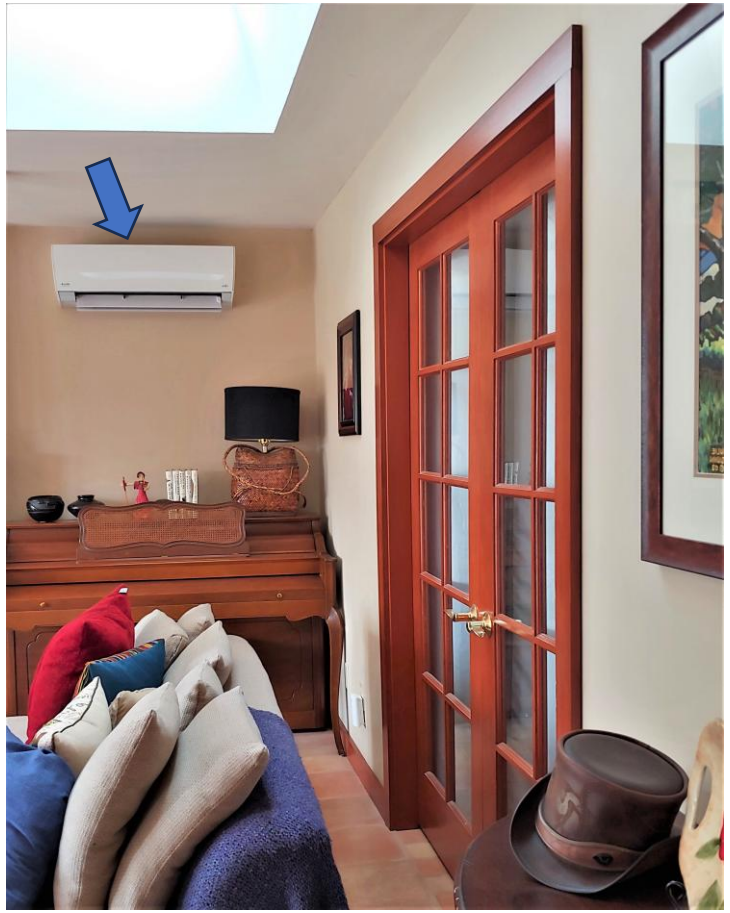
- Mini-Split system heat pumps can offer a straight forward solution
- Condenser can be ground or wall mounted
- One condenser can be shared by the main dwelling and the ADU
- Each dwelling has its own indoor unit and thermostat



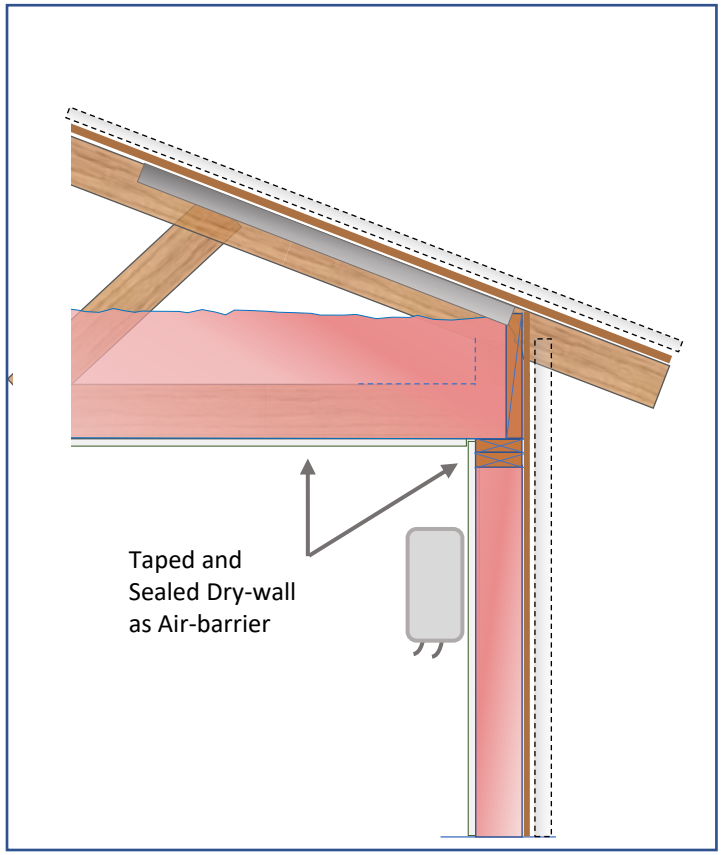
Wall Mounted Ductless Mini-Split

Best practices for ductless mini-split installation

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



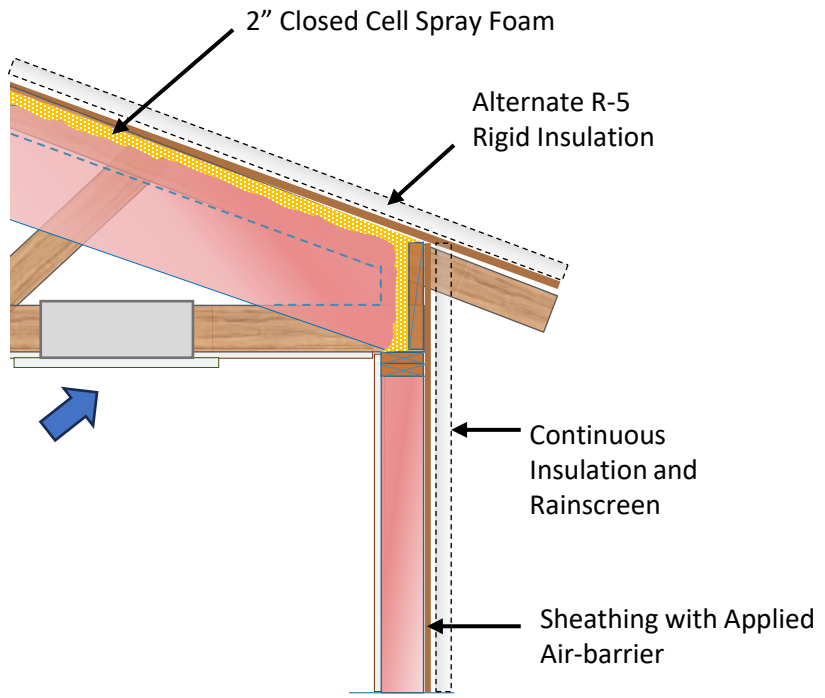
Ductless Wall Mount



Vented Attic with a Continuous Air and Thermal Boundary

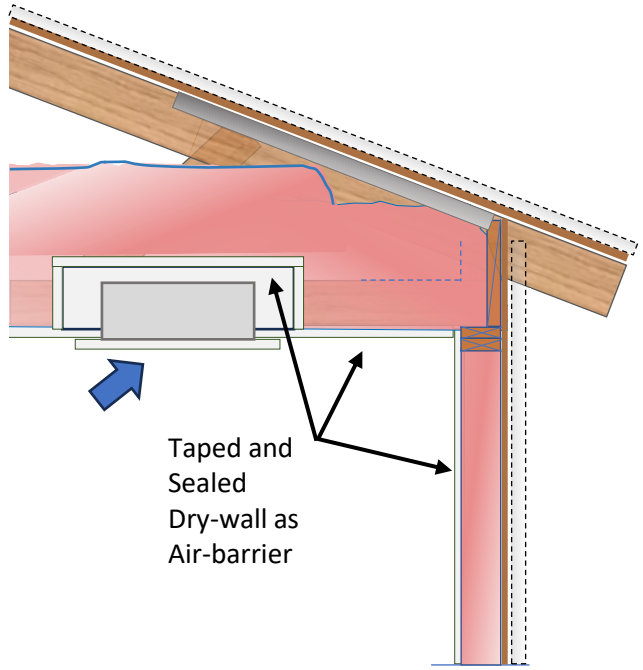
Recessed Ceiling Ductless Mini-Split

Indoor units should be installed within the air and thermal boundaries



Unvented Attic with a Continuous Air and Thermal Boundary

Ductless Recessed-Ceiling



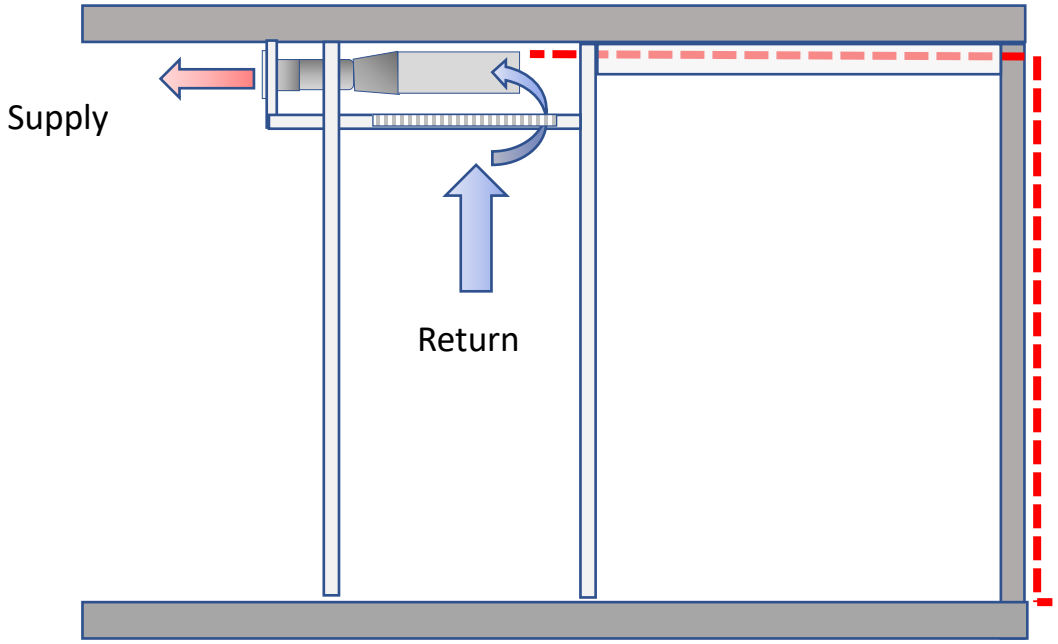
Vented Attic with a Continuous Air and Thermal Boundary

Multi-Family Example:

Ducts in Conditioned Space with a Mini-split System

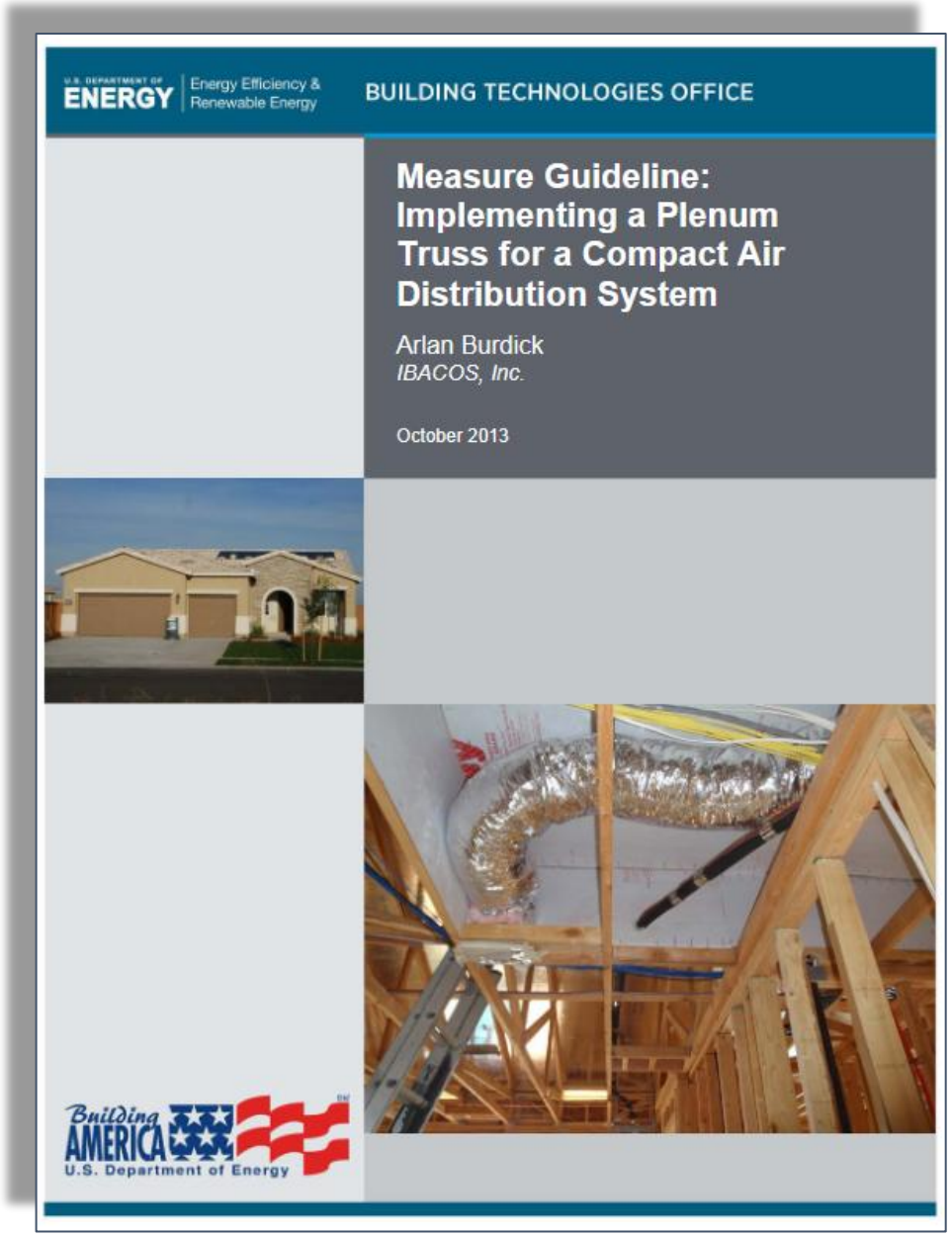
Soffit with Short-Ducted Vents

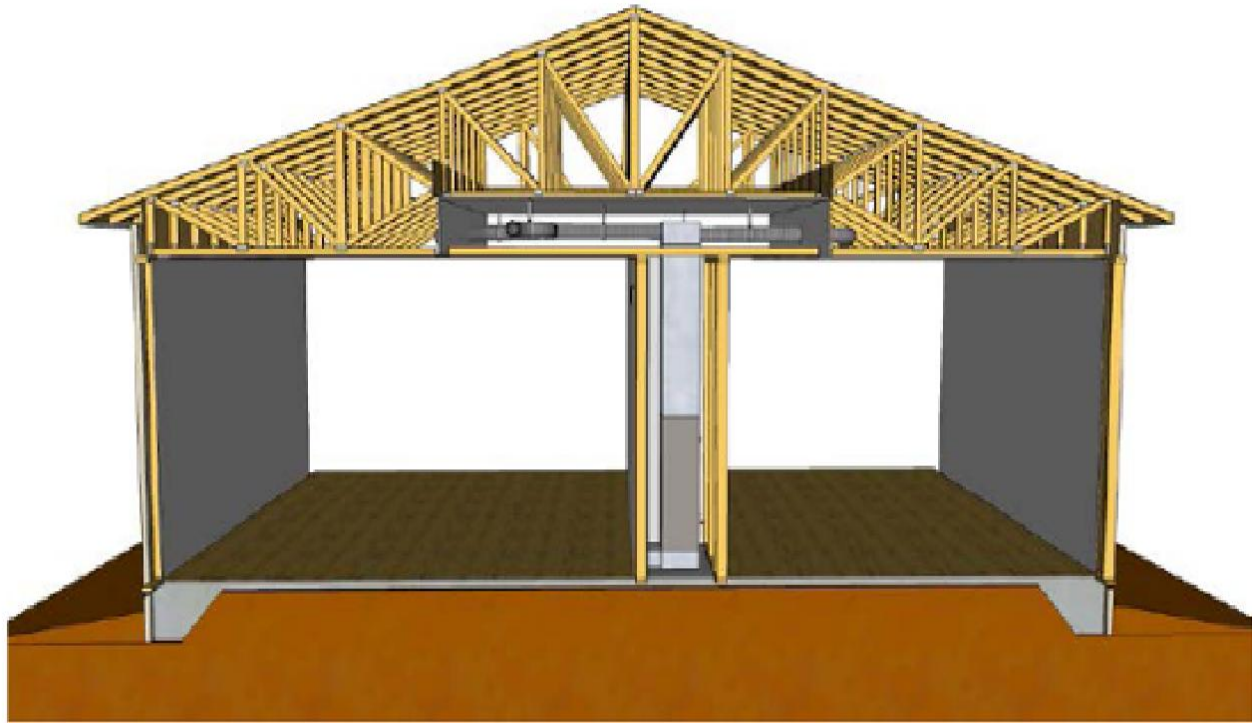
Access Panel
Return Grille



Split System: Fan Coil – Concealed Ducted Unit

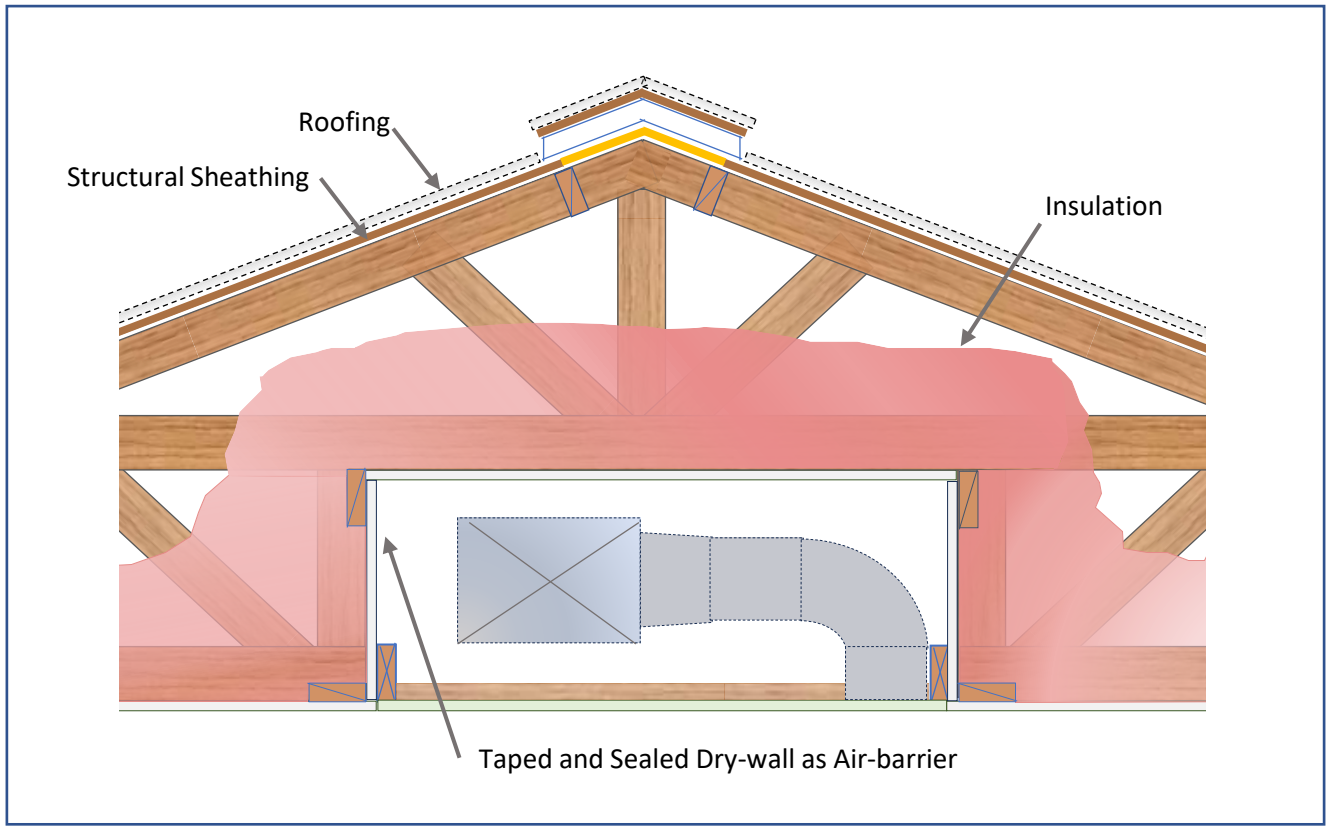
Ducts in Conditioned Space – Plenum Truss / Inverted Sofits



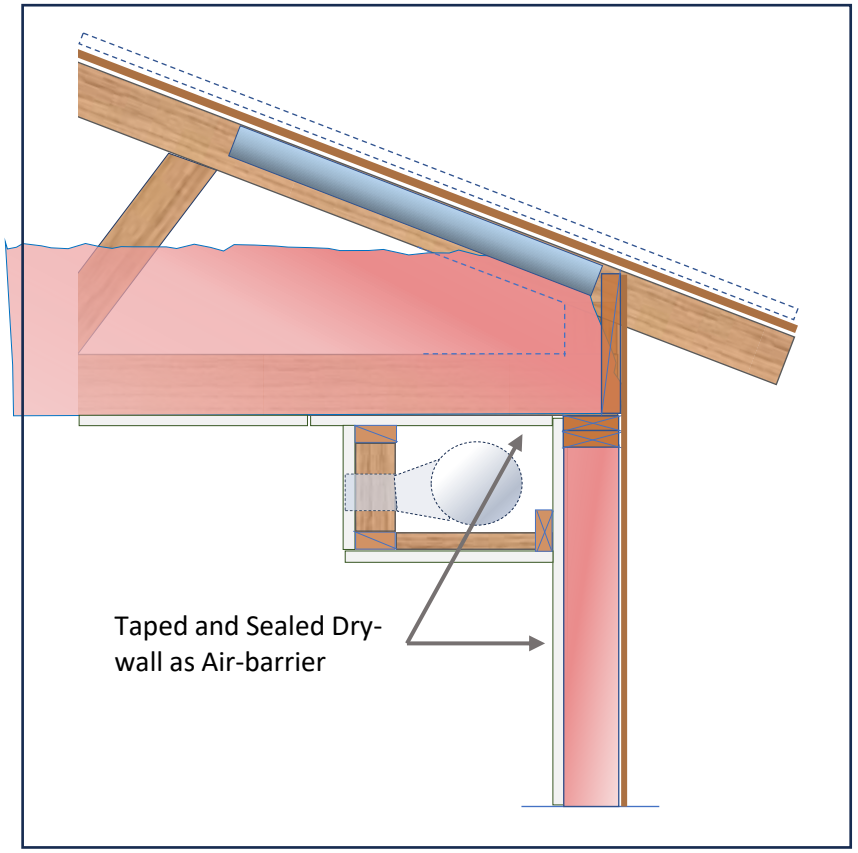


https://www1.eere.energy.gov/buildings/publications/pdfs/building_america/measure_guide_plenumtruss_air_distribution.pdf

Sequencing is Important – Recessed Ceiling / Inverted Sofit



Modified "Attic Truss" with Continuous Air-Barrier Above Duct System



Soffit Below Continuous Air-Barrier Ceiling/Attic

Air-Barrier can be taped and sealed drywall, OSB, Plywd, etc

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)

Section 150.0(o)

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

For New Construction (any size) and Additions greater than 1,000 ft^2

Kitchen –Range Hood

Table 150.0-G Kitchen Range Hood Airflow Rates (cfm) and ASTM E3087 Capture Efficiency (CE) Ratings According to Dwelling Unit Floor Area and Kitchen Range Fuel Type

Dwelling Unit Floor Area (ft^2)	Hood Over Electric Range	Hood Over Natural Gas Range
>1500	50% CE or 110 cfm	70% CE or 180 cfm
>1000 - 1500	50% CE or 110 cfm	80% CE or 250 cfm
750 - 1000	55% CE or 130 cfm	85% CE or 280 cfm
<750	65% CE or 160 cfm	85% CE or 280 cfm

Note:
In this example, a hood CE of 65% or 160 cfm minimum airflow would comply for only electric ranges.

Other exhaust fans, such as downflow, shall be 300 cfm or 5 ACH for enclosed kitchens

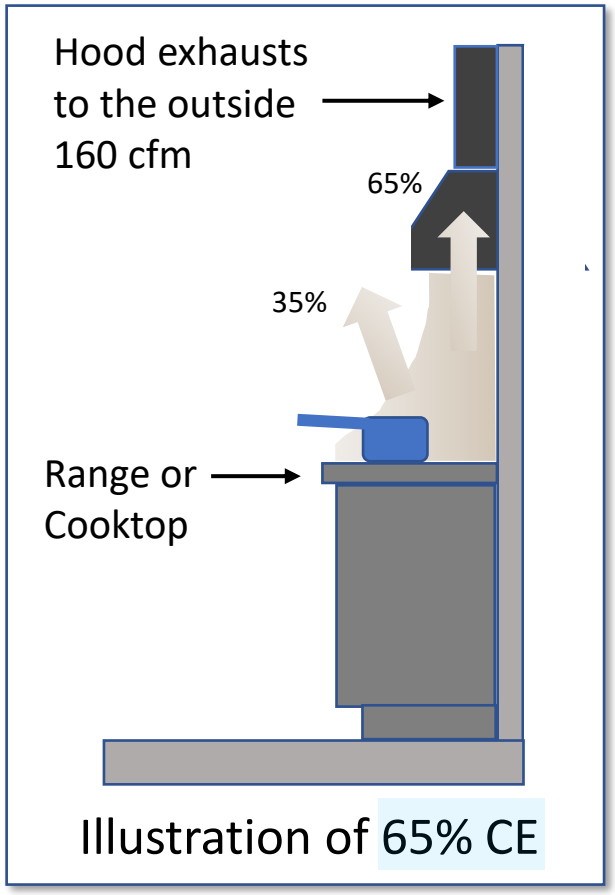
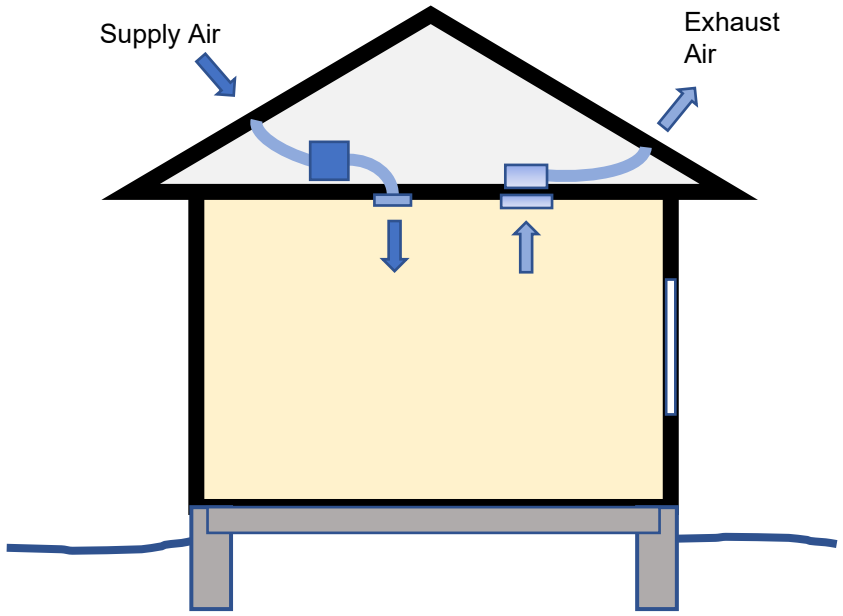


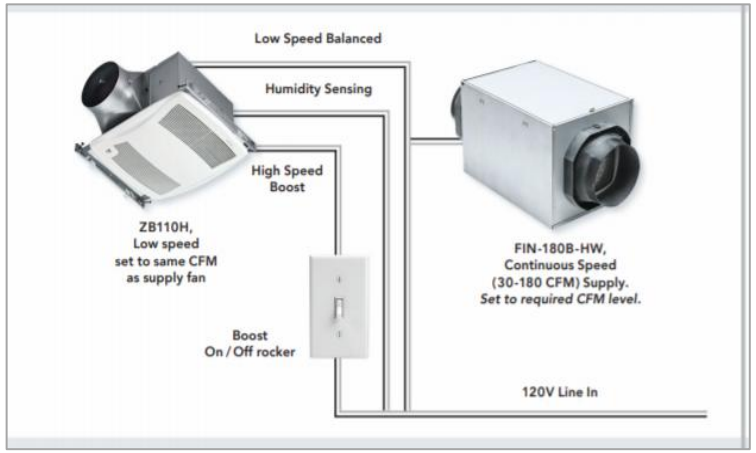
Illustration of 65% CE

Exhaust Only vs Balance Ventilation



Balanced Ventilation

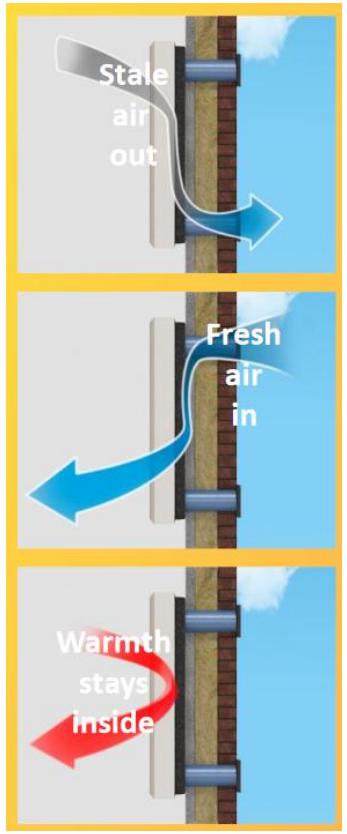
- Does not depend on construction assemblies that leak air
- Avoids uncontrolled air infiltration and/or exfiltration,
- Air-Leakage Sealing is a Mandatory Requirement
- ECC Quality Insulation Installation (QII) –includes visual confirmation of air sealing – is now a Prescriptive Requirement



https://www.broan-nutone.com/

Balanced Ventilation with Heat Recovery

Through the Wall without Ducting



Fresh-r

TwinFresh

Lunos

Ceiling Recessed with 3” Ducts

Panasonic ERV

Through-the-Wall Spot IAQ Ventilation

Inside Cover and Exterior Opening for Spot IAQ Ventilation

Performance Credit:
Balance Ventilation with Heat/Energy Recovery

Must be HVI Certified. See Products Directory ***www.HVI.org***

Indoor Air Quality and Mechanical Ventilation

CALIFORNIA ENERGY COMMISSION CEC-CF3R-MCH-27-H

Indoor Air Quality and Mechanical Ventilation

CALIFORNIA ENERGY COMMISSION CEC-CF3R-MCH-27-H

SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

C. Ventilation - Total Ventilation Rate

A mechanical supply system, exhaust system, or combination thereof shall provide whole-dwelling ventilation with outdoor air each hour at no less than the rate in 150.0(o)1Ci

01	Total Required Ventilation rate, (Q_{tot})	
02	Enclosure Leakage Rate (Q_{50})	
03	Effective Annual Average Infiltration Rate (Q_{inf})	
04	Total Exterior Envelope Surface Area	
05	Unshared Exterior Envelope Surface Area (exclude surface areas attached to garages or other dwelling units)	
06	Required Mechanical Ventilation Rate (Q_{fan})	

D. Installed Ventilation - Total Ventilation Rate

A mechanical supply system, exhaust system, or combination thereof shall provide whole-dwelling ventilation with outdoor air each hour at no less than the rate in 150.0(o)1Ci

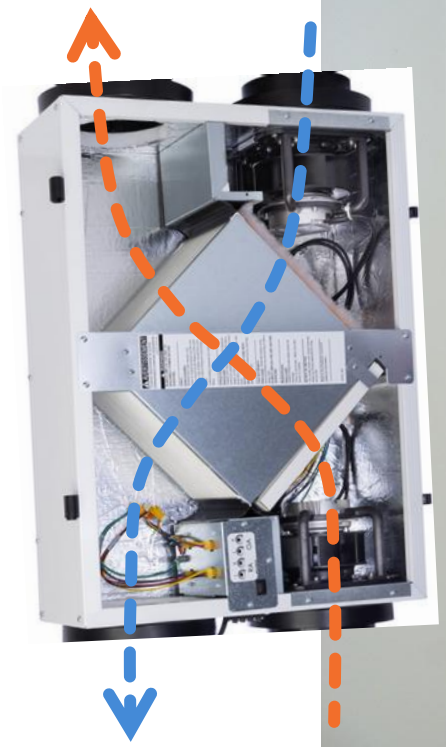
01	02	03	04	05
Fan Name	Fan Location	Runtime (Min/Hr)	Installed Mechanical Ventilation Rate (CFM)	Equivalent Continuous Ventilation (CFM)
06	Total Installed Equivalent Continuous Ventilation (CFM)			

D2. HRV or ERV Information

Balanced ventilation systems shall comply with appropriate requirements in 150.0(o)2C.

01	02	03
Manufacturer Make	Manufacturer Model Number	Fan Efficacy Performance Rating (W/CFM)

B. Single Family Attached/Detached General Information



Balanced Ventilation
ERV Provides Outside Air (OA)

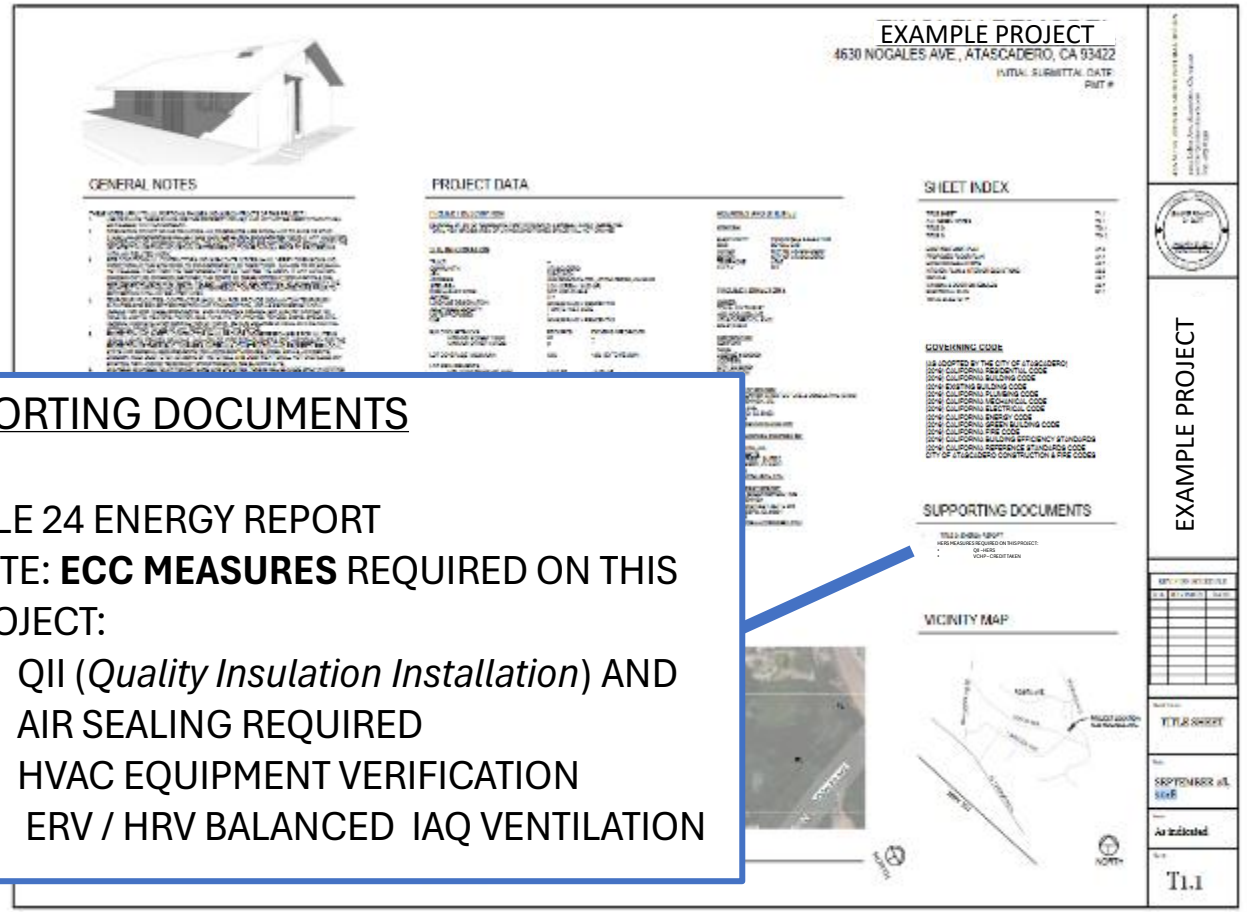
Tips and Resources
…and Wrap-up

Consider Including Key Energy Measures on the Cover Sheet

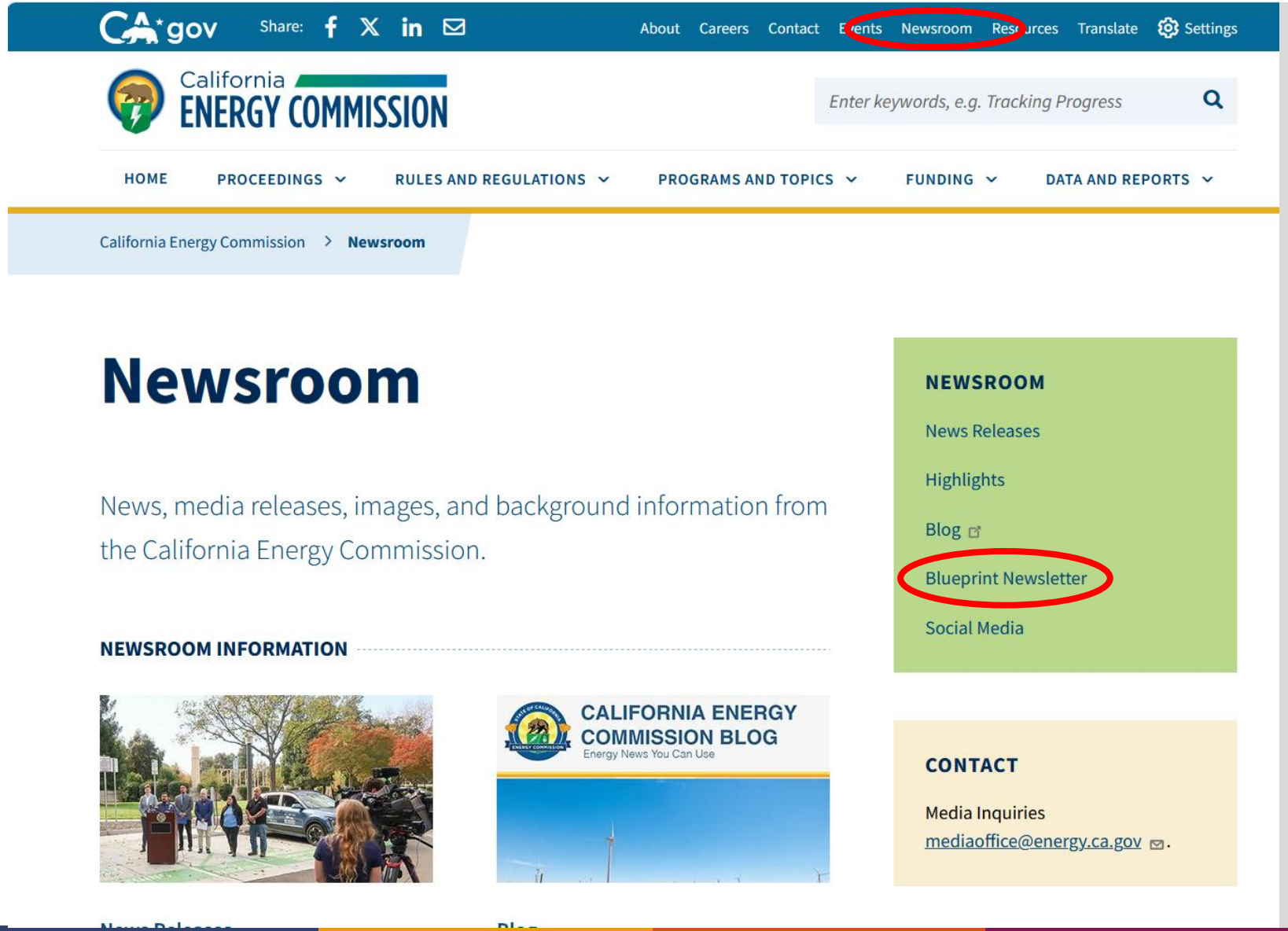
If a project design includes ECC measures (See CF1R or LMCC) consider calling that out on the Cover Sheet, suggested locations:

- ‘Code Summary’
- ‘Code Analysis’
- ‘Supporting Documents’
- ‘ECC (Formerly HERS) Summary’

Also, consider including additional notes from the sample CF2R’s that directly address insulation and air sealing details.



Blueprint Newsletter –find it in the Newsroom

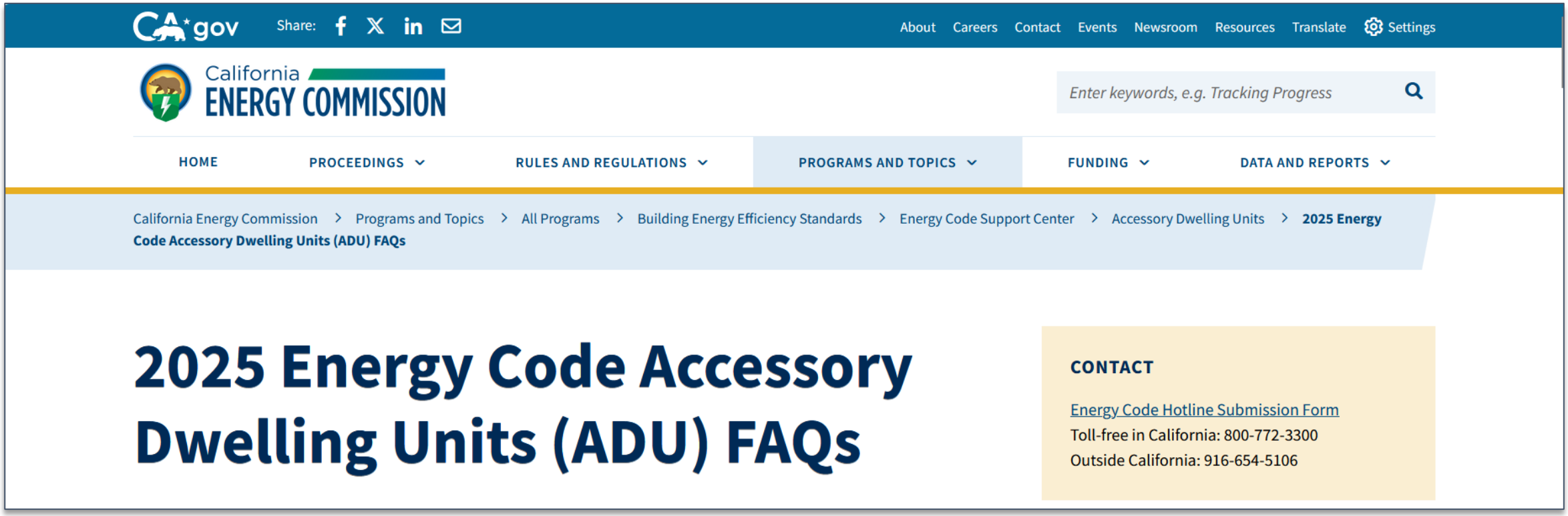


https://www.energy.ca.gov/newsroom

- Published quarterly
- Short –quick read with packed info
- Common Q and A for code enforcement /interpretations
- Offers clarifications on code issues
- Keeps readers up to date on latest code concerns
- PDF Version available for Fall 2025 and older
- 2026 moved to digital format

CEC –ADU Resources

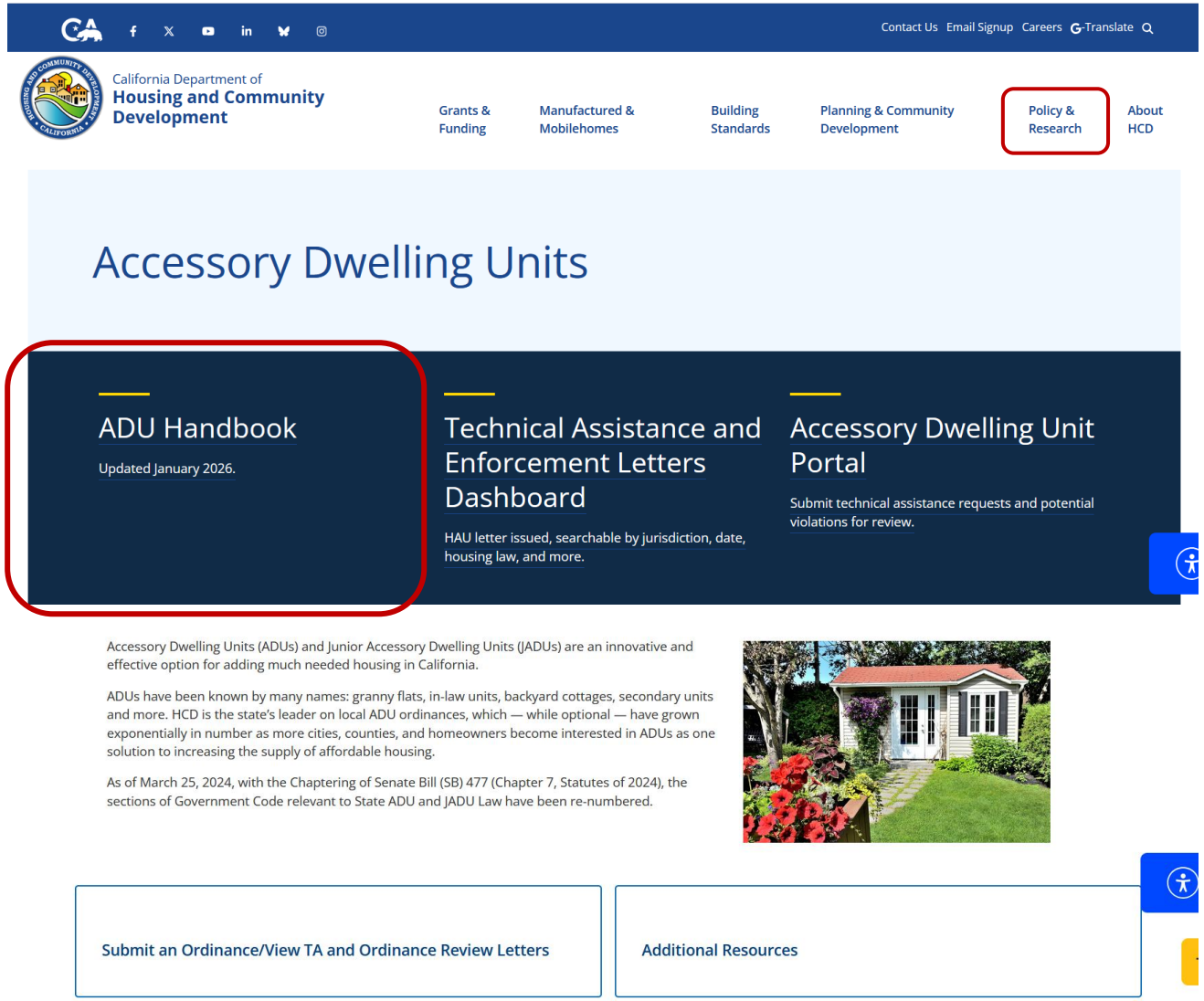
https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/energy-code-support-center-6/2025

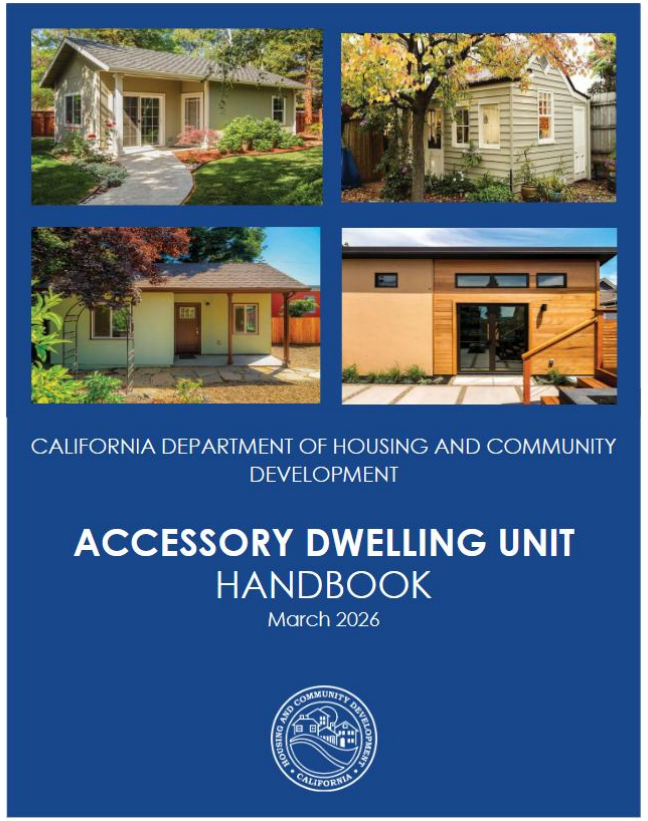


- General Information on ADUs
- Solar Photovoltaics (PV) System Requirements for ADUs
- Battery Energy Storage System (BESS) ready Requirements for ADUs
- Water Heating and Electric-ready Requirements for ADUs
- Heating, Ventilation, and Air Conditioning (HVAC) Requirements for ADUs
- Envelope and Lighting Requirements for ADUs
- More Resources for ADUs

ADU– Resources

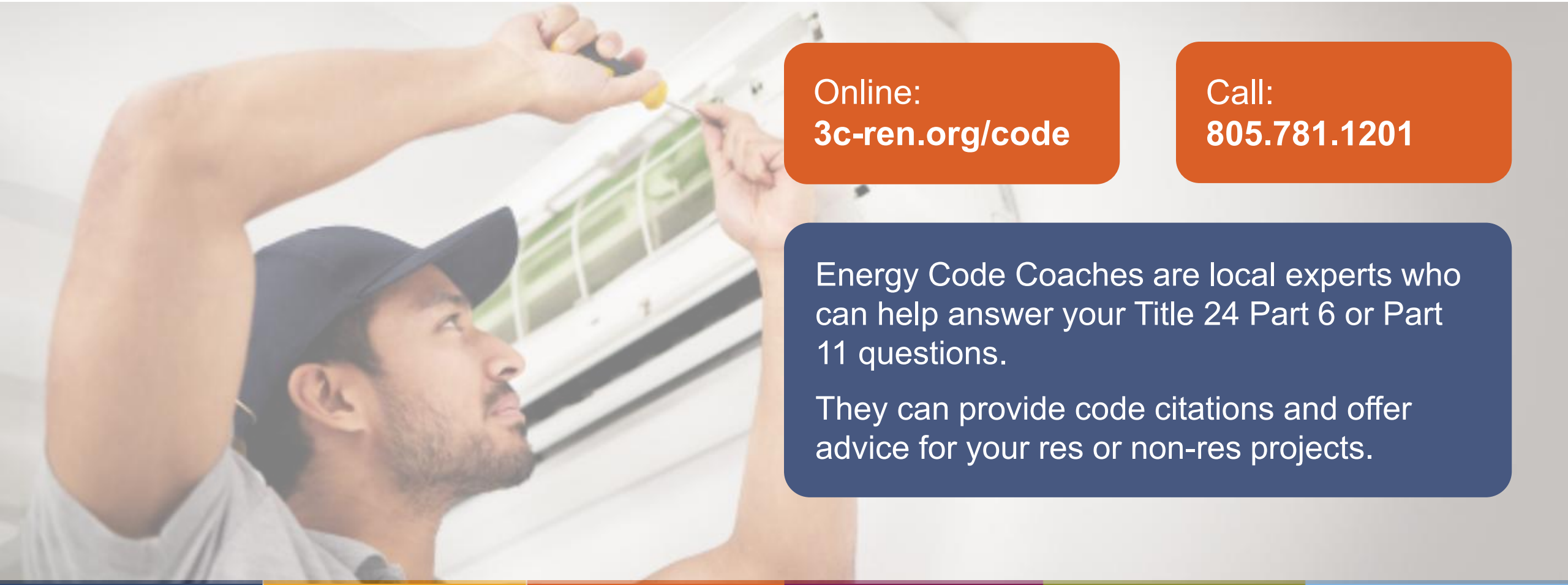
https://www.hcd.ca.gov





Questions about Title 24?

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

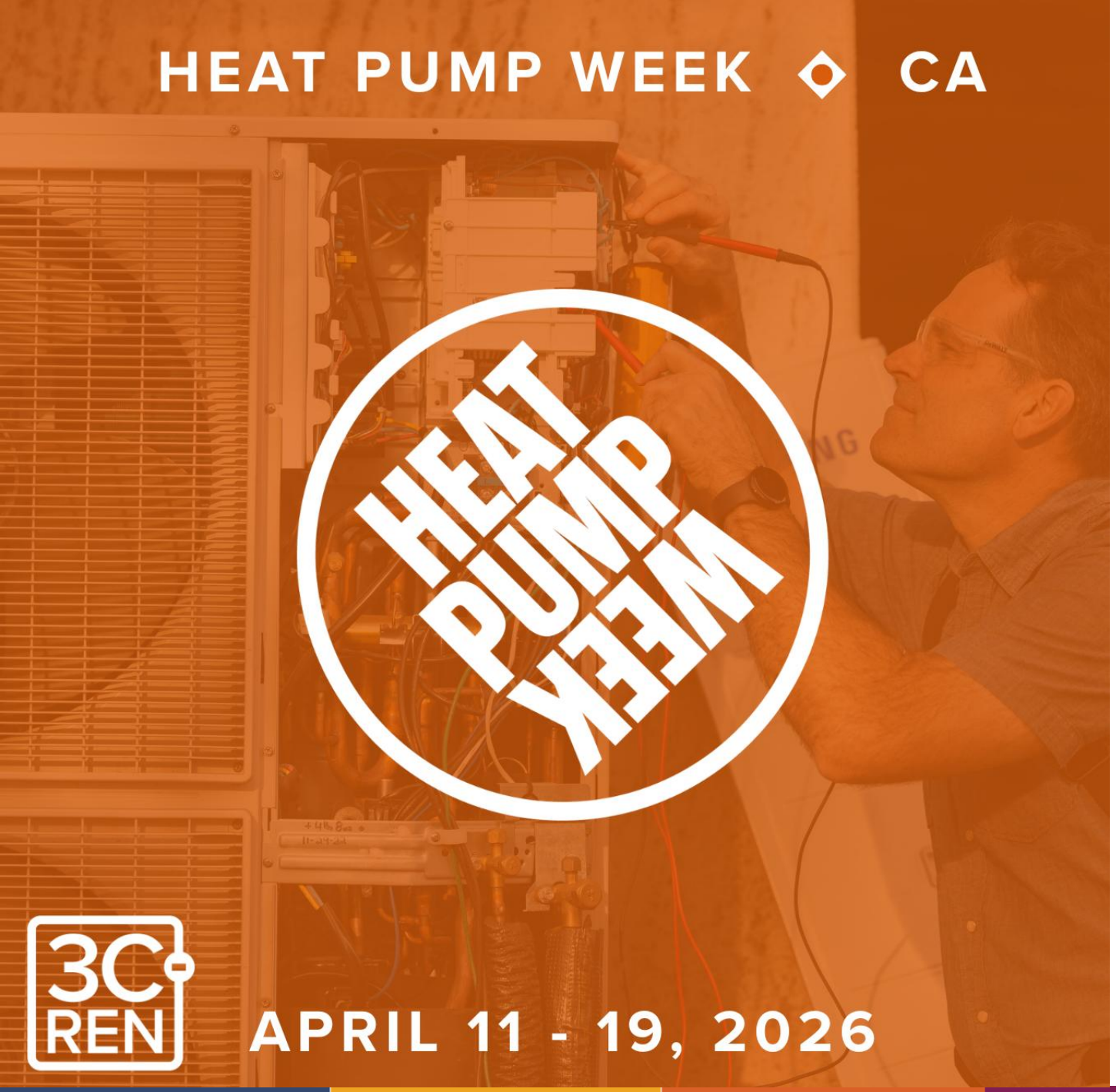


Online:
3c-ren.org/code

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.



Celebrate Heat Pump Week with 3C-REN!

Heat pumps are a cornerstone of California's clean and affordable energy future and are growing in popularity.

To help raise awareness and speed the adoption of heat pumps, the California Heat Pump Partnership is hosting the state's first-ever **Heat Pump Week** from April 11-19, 2026.

Check Out 3C-REN's Heat Pump Week Events:

- **4/13** Intro to Heat Pumps
- **4/14** Ask the Experts: No More Heat Pump Headaches

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 in Practice Series:

- 5/13 Multifamily Residential
- 6/3 Nonresidential

Other Upcoming Courses:

- 4/16 Energy Performance & Fire Resistant Construction
- 4/28 Multifamily DHW
- 4/29 Retrofit Ready? Navigating the 2025 Energy Code for Aging Buildings

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**

3C-REN

TRI-COUNTY REGIONAL ENERGY NETWORK

SAN LUIS OBISPO • SANTA BARBARA • VENTURA