

# 2022 Energy Code

## Accessory Dwelling Units



California Energy Commission  
Allen Wong  
San Joaquin Valley Chapter, International Code Council  
February 8, 2024



# Agenda

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- Energy Code basics
- ADUs - Definitions and clarifications
- ADUs - Additions
- ADUs - New construction
- Plan check and inspection
- Resources



# 2022 Energy Code Basics





# 2022 Energy Code

## Effective January 1, 2023

- Building permit applications submitted on or after effective date
- Must use 2022 software and forms





# 2022 Documents Online

## 2022 Building Energy Efficiency Standards

The Building Energy Efficiency Standards (Energy Code) apply to newly constructed buildings, additions, and alterations. They are a vital pillar of California's climate action plan. The 2022 Energy Code will produce benefits to support the state's public health, climate, and clean energy goals.

The California Energy Commission (CEC) updates the Energy Code every three years. On August 11, 2021, the CEC adopted the 2022 Energy Code. In December, it was approved by the California Building Standards Commission for inclusion into the California Building Standards Code. The 2022 Energy Code encourages efficient electric heat pumps, establishes electric-ready requirements for new homes, expands solar photovoltaic and battery storage standards, strengthens ventilation standards, and more. Buildings whose permit applications are applied for on or after January 1, 2023, must comply with the 2022 Energy Code.



**2022 Energy Code for Residential and Nonresidential Buildings**

[2022 ENERGY CODE >](#)

Expand All

- Supporting Documents – Appendices, Compliance Manuals, and Forms +
- Software – Compliance Software, Manuals, and Tools +

### BUILDING ENERGY EFFICIENCY STANDARDS - TITLE 24

- 2025 Building Energy Efficiency Standards
- 2022 Building Energy Efficiency Standards** ^
  - Workshops, Notices, and Documents
- 2019 Building Energy Efficiency Standards
- 2016 Building Energy Efficiency Standards
- Past Building Energy Efficiency Standards
- Climate Zone tool, maps, and information supporting the California Energy Code
- Online Resource Center
- Solar Assessment Tools

### RELATED LINKS

[Workshops, Notices, and Documents](#)

### CONTACT

[Building Energy Efficiency Standards - Title 24](#)

Toll-free in California: 800-772-3300  
Outside California: 916-654-5106

### SUBSCRIBE

Building Energy Efficiency Standards

Email \*

SUBSCRIBE

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



# Energy Code Requirements

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## Mandatory requirements

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

## Prescriptive requirements

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



# Compliance Approaches

## Prescriptive approach

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

## Performance approach

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





# 2022 Performance Metrics

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## Energy performance calculations

- Single-family energy design rating (EDR)
  - EDR1: hourly source energy
  - EDR2: time dependent valuation (TDV)
    - Efficiency EDR, PV + flexibility EDR, total EDR



# Demonstrating Compliance

## Compliance forms confirm Energy Code is met

- Completed by responsible party
  - Designers, consultants, builders, contractors, technicians, HERS raters, etc.
- Submitted to enforcement agencies for verification

Type of form	Single-family
Certificate of compliance	CF1R
Certificate of installation	CF2R
Certificate of verification	CF3R



# 2022 Compliance Software

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Performance approach must use approved compliance software versions

- Single-family
  - CBECC-Res 2022.3.0
  - EnergyPro 9.2
  - Wright-Energy 2022.2.0



# 2022 Energy Code

## ADU - Definitions and Clarifications



# Energy Code Definitions

All buildings § 100.1

Updated for 2022



## Single-family building

- Occupancy group R-3
  - Two or less dwelling units
  - Not multifamily, hotel or motel
- Townhouse
- Occupancy group R-3.1
- Occupancy group U on residential site



# Energy Code Definitions

All buildings § 100.1

## **Newly constructed building**

- Building that has never been used or occupied for any purpose

## **Addition**

- Any change to existing building that increases conditioned floor area (CFA) and conditioned volume
- **Newly conditioned space**
  - Any space being converted from unconditioned space to directly or indirectly conditioned space

## **Alteration**

- Any change to building components with requirements in the Energy Code



# Energy Code Definitions

All buildings § 100.1

New for 2022

## Attached dwelling unit

- Shares a common wall or floor/ceiling with another dwelling unit

## Junior accessory dwelling unit (JADU)

- No more than 500 square feet and contained entirely within an existing single-family building



# ADU Defined

## CBC Part 2

### Accessory dwelling unit (ADU)

- Secondary dwelling unit on residential lot
- Occupancy group R residential
- Attached, detached, converted
- Independent living space

Tiny house  
Garage apartment  
In-law suite  
Granny flat  
Carriage house  
Garden cottage  
Secondary house

***ACCESSORY DWELLING UNIT. [HCD 1 & HCD 2]** An attached or detached residential dwelling unit that provides complete independent living facilities for one or more persons and is located on a lot with a proposed or existing primary residence. Accessory dwelling units shall include permanent provisions for living, sleeping, eating, cooking and sanitation on the same parcel as the single-family or multifamily dwelling is or will be situated. (See Government Code Section 65852.2)*



# ADU Scenarios

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## Attached ADU

- Connected to the existing dwelling
  - Common wall, ceiling, floor
- Addition - newly constructed or newly conditioned space
- Alteration - previously conditioned space
- Never considered newly constructed building

## Detached ADU

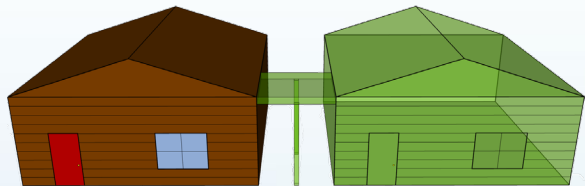
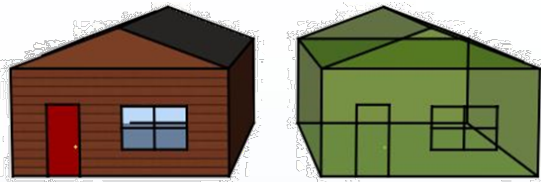
- Separate from the existing dwelling
  - No shared walls, ceilings, floors
- Newly constructed - built from the ground up
- Addition - newly conditioned space
- Alteration – previously conditioned space



# ADU Scenarios

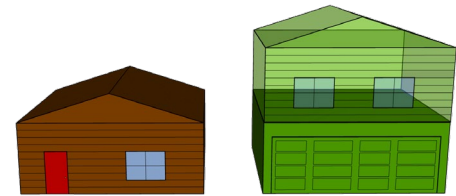
## New Construction

Detached new building



## Additions

Attached



Attached conversion



Detached conversion





# 2022 Energy Code ADUs - Additions

§150.2(a)



# Additions

# Mandatory Requirements

## Single-family § 150.2(a)

Updated for 2022

### Additions to existing single-family buildings

- Meet mandatory §§ 110.0-110.9 and 150.0(a-n, p, q)
- Meet either § 150.2(a)1 or 2
- Exception 4: Space conditioning system ducts
  - Any length of ducts extended from existing duct system to serve the addition to meet duct sealing and duct insulation requirements per §§ 150.2(b)1Di and 150.2(b)1Dii
- Exception 7: Space heating system
  - New or replacement space heating systems serving additions may be heat pump or gas



# Additions Mandatory Requirements

Single-family §§ 150.2(a), 150.0(m)



## Completely new space conditioning systems (ducting and equipment)

- Duct insulation
- HERS testing
  - Leakage testing
  - Airflow and fan efficacy
  - Refrigerant charge in climate zones 2, 8-15
- Air filtration
  - MERV 13 filters



# Additions

# Mandatory Requirements

Single-family §§ 150.2(a), 150.0(k)

Updated for 2022



## Lighting

- Newly installed and replaced hardwired lighting, indoor and outdoor
  - Table 150.0-A or JA8
- Recessed downlights
  - No screw base
- Dimmer control
  - Living, dining, kitchen, bedroom
- Auto-off control - occupancy or vacancy
  - Bathrooms, garage, laundry, utility, walk-in closets



# Additions

# Prescriptive Requirements

Single-family §§ 150.2(a), 150.1(c)11

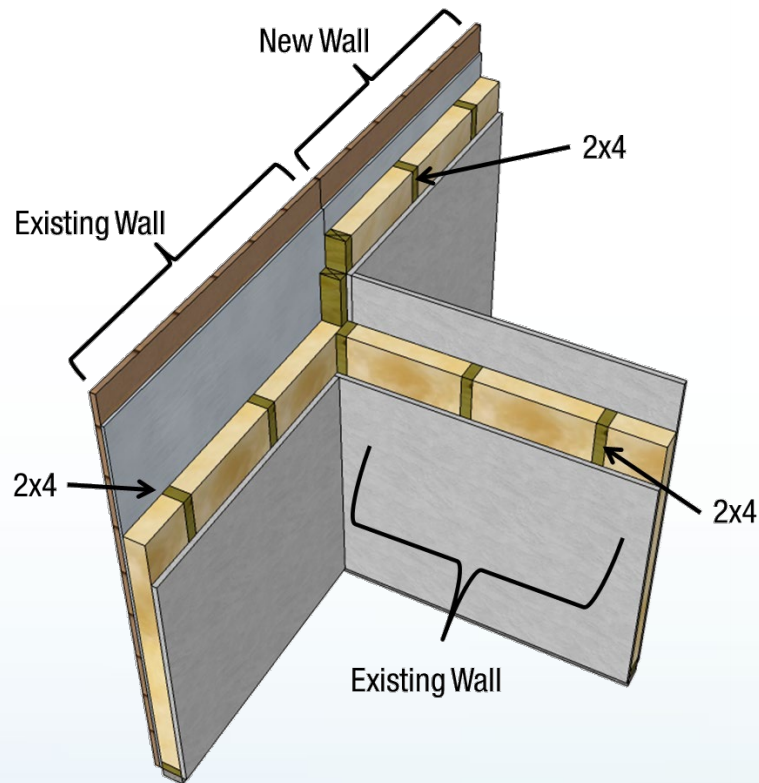
## Additions more than 300 ft<sup>2</sup> - roofing

- New portion of roof meet aged solar reflectance (SR) and thermal emittance (TE)
- Low-sloped roofs climate zones 13, 15
  - Minimum aged SR 0.63
  - Minimum TE 0.75
- Steep-sloped roofs in climate zones 10-15
  - Minimum aged SR 0.20
  - Minimum TE 0.75



# Insulation Additions Prescriptive Requirements

Single-family §150.2(a)1A



## All additions

- Wall extensions, and walls where existing siding is unaltered
  - R-21 in 2x6 wood-framed, no continuous
  - R-15 in 2x4 wood-framed, no continuous
  - QII exceptions
    - No insulated headers for existing doors and windows
    - No air sealing if existing air barrier not altered



# Additions Prescriptive Requirements

Single-family § 150.2(a)1B

Updated for 2022

## Additions 700 square feet or less – roof and ceiling insulation

- Roof and ceiling insulation
  - Climate zones 1, 2, 4, 8-16 overall assembly U-factor 0.025
    - Wood framed: R-38 or greater
  - Climate zones 3, 5-7 overall assembly U-factor 0.031
    - Wood framed: R-30 or greater
- Exception: enclosed rafter ceiling meet mandatory per § 150.0
- QII not required



# Additions

## Prescriptive Requirements

Single-family §150.2(a)1A-B

### New windows, skylights, and glazed doors

- Meet U-factor .30 and SHGC .23 per § 150.1(c)
- Fenestration area per CFA and climate zone

Addition Square Feet	Max Total Fenestration Area	Max West-Facing Area Climate Zones 2, 4, 6-15
Over 700	Larger of 175 ft <sup>2</sup> or 20% CFA	70 ft <sup>2</sup>
401 to 700	Larger of 120 ft <sup>2</sup> or 25% CFA	60 ft <sup>2</sup>
400 or less	Larger of 75 ft <sup>2</sup> or 30% CFA	60 ft <sup>2</sup>



# Additions Prescriptive and Performance Requirements

Single-family §§ 150.2(a)1C, 150.2(a)2C

Updated for 2022

## Mechanical ventilation for indoor air quality comply with §150.0(o)

- Whole-dwelling unit mechanical ventilation
  - Exceptions
    - Additions 1,000 ft<sup>2</sup> or less
    - Junior ADUs that are additions to an existing building
  - Note: New ADUs must comply with IAQ regardless of size
- Local mechanical exhaust
  - Additions to existing buildings shall comply with all applicable requirements specified in §§ 150.0(o)1G and 150.0(o)2



# Additions

## Mandatory Requirements

Single-family §§ 150.2(a)1Ci, 150.0(o)1C

### Whole dwelling unit ventilation per ASHRAE 62.2

- 2022 Equation 150.0-B
  - $Q_{\text{tot}} = 0.03 \times A_{\text{floor}} + 7.5 \times (\text{Nbr} + 1)$ 
    - $Q_{\text{tot}}$  = total required ventilation rate, cfm
    - $A_{\text{floor}}$  = dwelling-unit floor area, ft<sup>2</sup>
    - Nbr = number of bedrooms (not less than 1)



# Additions

# Mandatory Requirements

Single-family §§ 150.2(a)1Cii, 150.0(o)1G

New for 2022

## Local mechanical exhaust

- Kitchen and bathroom exhaust requirements added to incorporate ASHRAE 62.2
- Adds Table 150.0-E, Table 150.0-F, Table 150.0-G for ventilation rates and capture efficiency

## Airflow rate measurement for local exhaust by the installer

- Clarifies only measurement methods in RA3.7
  - Airflow rate when capture efficiency is used for compliance
  - Table 150.0-H prescriptive duct sizing table may be used for capture efficiency compliance

## Sound ratings for local exhaust

- Sound rating to use minimum airflow rates required per § 150.0(o)1G



# Ventilation and IAQ Mandatory Requirements

## 2022 Single-family Tables 150.0-E, 150.0-F

New for 2022

Table 150.0-E Demand-Controlled Local Ventilation Exhaust Airflow Rates and Capture Efficiency

Application	Compliance Criteria
Enclosed Kitchen or Nonenclosed Kitchen	Vented range hood, including appliance-range hood combinations shall meet either the capture efficiency (CE) or the airflow rate specified in Table 150.0-G as applicable.
Enclosed Kitchen	Other kitchen exhaust fans, including downdraft: 300 cfm (150 L/s) or a capacity of 5 ach
Nonenclosed Kitchen	Other kitchen exhaust fans, including downdraft: 300 cfm (150 L/s)
Bathroom	50 cfm (25 L/s)

Table 150.0-F Continuous Local Ventilation Exhaust Airflow Rates

Application	Airflow
Enclosed kitchen	5 ach, based on kitchen volume
Bathroom	20 cfm (10 L/s)

### ASHRAE 62.2

**Enclosed kitchen:**  
kitchen whose permanent openings to interior adjacent spaces do not exceed 60 square feet in total



# Ventilation and IAQ Mandatory Requirements

## Single-family Table 150.0-G

New for 2022

*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*

<b>Dwelling Unit Floor Area (ft<sup>2</sup>)</b>	<b>Hood Over Electric Range</b>	<b>Hood Over Natural Gas Range</b>
>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



# Additions

# Mandatory Requirements

Single-family § 150.0(o)2A-C

New for 2022

## HERS verifications

- Whole-dwelling unit ventilation
  - Airflow measurement per ASHRAE 62.2 for balanced airflow rate determination and measurement of systems with multiple operating modes
- Kitchen local exhaust
  - Vented range hoods installed to meet IAQ
  - Adds use of capture efficiency ratings for compliance



# Water Heating Additions Prescriptive Requirements

Single-family § 150.2(a)1D

Updated for 2022

## Water heating

- Heat pump water heater: meet either
  - Not located outdoors, on R-10 surface, demand responsive
  - High efficiency NEEA Tier 3
- Gas or propane instantaneous water heater
  - 200,000 Btu/hour or less
  - No storage tank
- Additions less than 500 ft<sup>2</sup>
  - Instantaneous electric water heater allowed
  - Point-of-use distribution per RA4.4.5



# **2022 Energy Code ADUs – New Construction**



# Insulation Mandatory Requirements

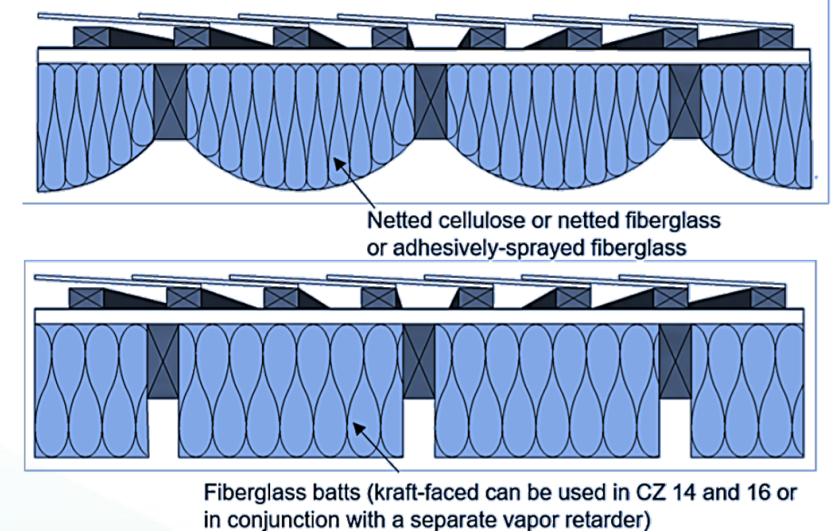
Single-family § 150.0(a)1

New for 2022

## Roof deck insulation

- Adds roof deck insulation to mandatory requirement
- Climate zones 4 and 8-16
- Maximum U-factor 0.184
- Exceptions:
  - Ducts and air handler located entirely in conditioned space
  - Air handler and 12 feet or less of supply duct in unconditioned space

Figure 3-25: Placement of Insulation Below the Roof Deck





# Quality Insulation Installation Prescriptive Requirements

Single-family §150.1(c)1E

## Quality insulation installation (QII)

- Requires HERS verification of installed insulation and exterior air barrier
- Meet criteria in Reference Residential Appendix RA3.5
- Not mandatory, but difficult to offset
- Modeling without can have 7-11% penalty

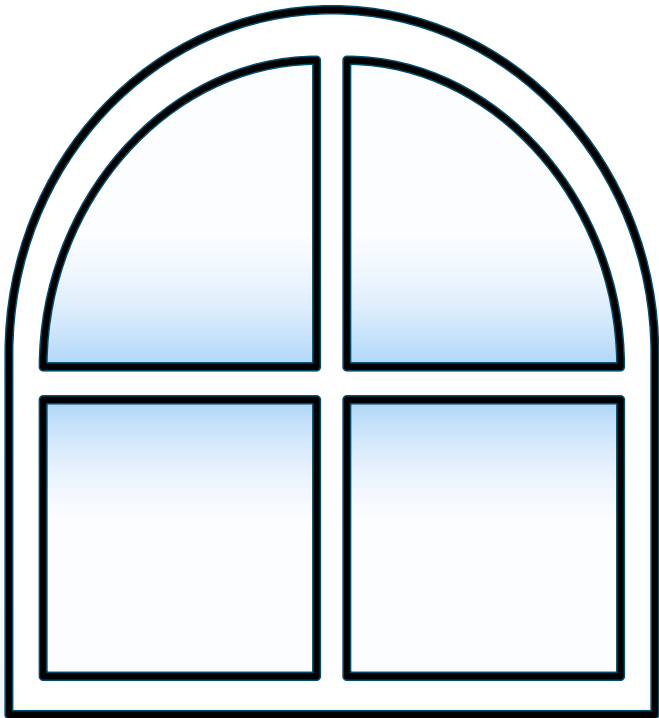




# Fenestration Mandatory Requirements

Single-family § 150.0(q)

Updated for 2022



## Fenestration products

- Mandatory U-factor more stringent
- Maximum U-factor 0.45
- All climate zones
- Area-weighted average allowed



# Lighting Mandatory Requirements

Single-family § 150.0(k)1-2

Updated for 2022



## Luminaire requirements

- Ceiling recessed downlight luminaires meet CA Electrical Code § 410.116

## Indoor lighting controls

- Adds auto-off controls for lighting in drawers and cabinets
- Undershef, display cabinets, switched outlets controlled separate from ceiling lighting
- Adds exceptions to dimming control requirements



# HVAC

# Mandatory Requirements

Single-family § 150.0(m)1B

Updated for 2022

## Duct insulation

- Ducts insulated to R-6.0
- Exception: portions of duct system located in conditioned space below ceiling separating occupiable space from attic
  - Non-insulated portion of duct system located entirely inside thermal envelope
  - Locations that penetrate unconditioned space, draft stopped and air-sealed, connections in unconditioned space insulated to R-6.0
- No duct insulation when duct system is located entirely in conditioned space with HERS verification per Reference Residential Appendix RA3.1.4.3.8



# HVAC

# Mandatory Requirements

Single-family § 150.0(m)11-12

Updated for 2022

## Duct system sealing and leakage testing

- HERS rater
  - Leakage testing
  - Airflow and fan efficacy
  - Refrigerant charge in climate zones 2, 8-15

## Air filtration

- MERV 13 filters
- Air filter racks or grilles be gasketed or sealed to prevent air from bypassing filter
- Make-up air systems comply same as supply ventilation systems



# Ventilation and IAQ Mandatory Requirements

Single-family § 150.0(o)1

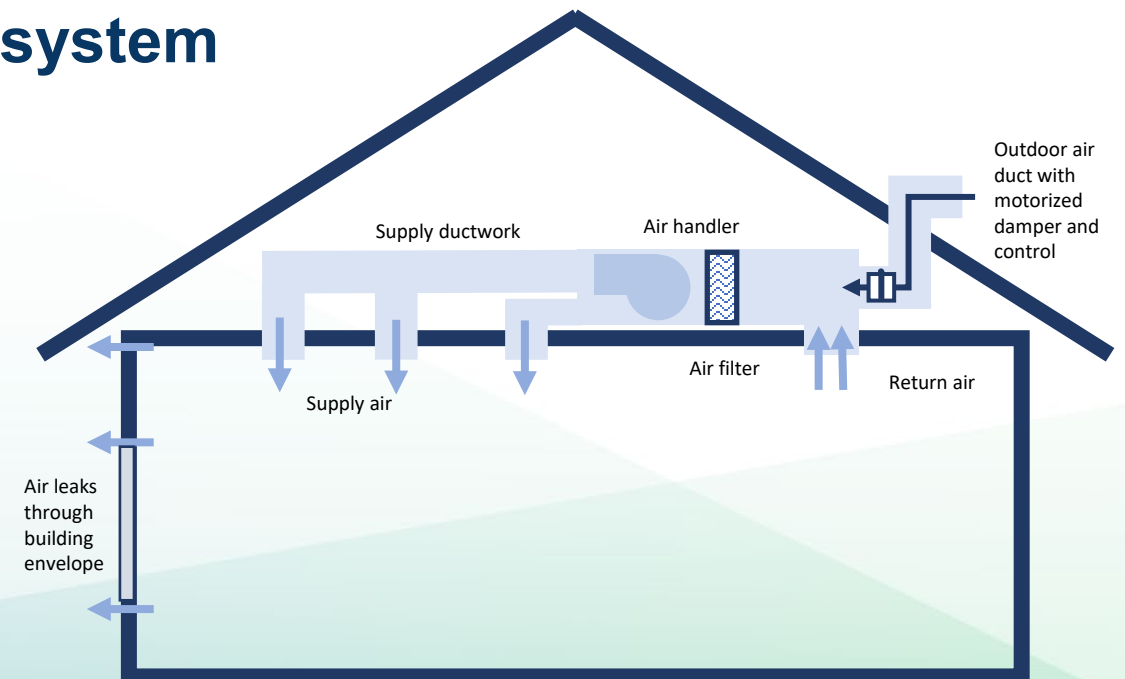
Updated for 2022

## Ventilation and indoor air quality

- References ASHRAE 62.2 (2019) per § 100.1
- Updates California amendments to ASHRAE 62.2

## Central fan integrated ventilation system

- Adds requirements
  - Outdoor air dampers
  - Damper control
  - Variable ventilation controls





# HVAC

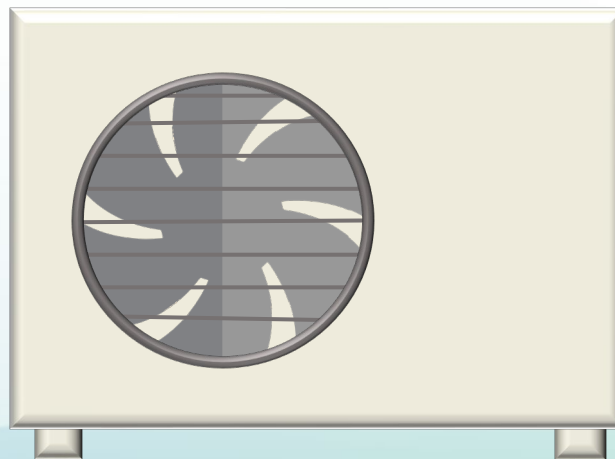
# Prescriptive Requirements

Single-family § 150.1(c)6

New for 2022

## Heating system type

- Heating system types installed per TABLE 150.1-A
- Climate zones 3, 4, 13, 14 use heat pump space conditioning
  - Note: other types may comply using performance method





# HVAC

## Prescriptive Requirements

Single-family § 150.1(c)10

Updated for 2022

### Adds small duct high velocity requirements

- Central fan integrated ventilation systems
  - Air handling unit fan efficacy maximum
    - 0.45 W/cfm for gas furnace air-handling units
    - 0.58 W/cfm for air-handling units that are not gas furnaces
    - 0.62 W/cfm for small duct high velocity air-handling units verified by HERS
  - Field verification
    - Diagnostic testing per RA3.3
    - Intermittent Systems per RA3.7.4.2



# HVAC

# Prescriptive Requirements

Single-family § 150.1(c)12

## Ventilation cooling

- Revises whole house fans to reference use of the Home Ventilating Institute (HVI) certified products directory
- Exception: new dwelling units with 500 ft<sup>2</sup> or less exempt

Updated for 2022





# Water Heating Prescriptive Requirements

Single-family § 150.1(c)8

Updated for 2022

## Domestic water-heating systems

- Heat pump water heater (HPWH) in all climate zones located in garage or conditioned space
  - HPWH 240V
    - Compact distribution in climate zones 1, 16
    - Drain water heat recovery in climate zone 16
  - HPWH 240V meets NEEA Tier 3 or higher
    - Drain water heat recovery in climate zone 16
- Solar water-heating system with electric backup
- Note: other types may comply using performance method





# Water Heating Prescriptive Requirements

Single-family § 150.1(c)8

Updated for 2022

## Domestic water-heating systems

- Exceptions
  - Climate zones 3, 4, 13, 14 may install instantaneous gas water heater and must use heat pump for space conditioning system
  - New dwelling unit with 500 ft<sup>2</sup> or less may install instantaneous electric water heater with point of use distribution per RA4.4.5
  - New dwelling unit with 1 bedroom or less may install 120V HPWH in place of 240V HPWH



# Electric Ready Mandatory Requirements

Single-family § 150.0(n)

Updated for 2022

## If using gas or propane water heating system

- Provide designated space for future heat pump water heater at least 2.5 feet by 2.5 feet and 7 feet tall
  - If within 3 feet of water heater
    - 125V, 20A circuit with 120/240V 3 conductor, 10 AWG circuit
    - Reserve and label single pole breaker in main panel
  - If more than 3 feet from water heater
    - 240V, 30A circuit with termination 3 feet from designated space
    - Reserve and label double pole breaker in main panel
    - Water lines, both hot and cold, route through designated space before reaching gas or propane water heater
    - Condensate drain



# Electric Ready Mandatory Requirements

Single-family §§ 150.0(t, u, v)

New for 2022

## Adds electric-ready requirements when installing gas systems

- Heat pump space heater ready
  - 240V, 30A circuit with termination 3 feet from furnace
  - Reserve and label double pole breaker in main panel
- Electric cooktop ready
  - 240V, 50A circuit with termination 3 feet from cooktop
  - Reserve and label double pole breaker in main panel
- Electric clothes dryer ready
  - 240V, 30A circuit with termination 3 feet from clothes dryer location
  - Reserve and label double pole breaker in main panel





# Energy Storage Systems Ready Mandatory Requirements

Single-family § 150.0(s)

New for 2022

## Adds energy storage systems (ESS) ready

- At least one shall be provided
  - ESS ready interconnection equipment with minimum backed up capacity of 60A and 4 ESS supplied branch circuits
  - Dedicated raceway from main service to subpanel that supplies branch circuits
- Identify at least 4 branch circuits for emergency use
  - Supply refrigerator, lighting near front door, one outlet in bedroom
- Main panel minimum busbar rating of 225A
- Space for future system isolation equipment or transfer switch within 3 feet of main panel
  - Raceways installed between panel and system isolation equipment or transfer switch location to allow the connection of backup power source



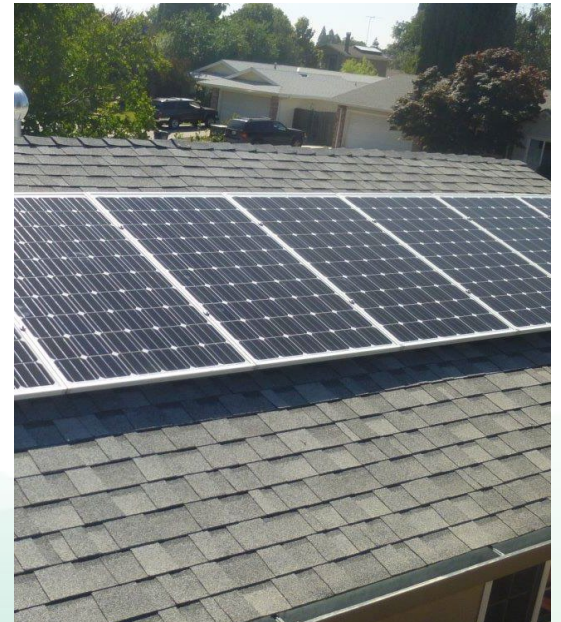


# Photovoltaic Systems Prescriptive Requirements

## Single-family § 150.1(c)14

Updated for 2022

- Updates single-family buildings must have newly installed PV system
- Updates Reference Joint Appendix JA11
  - Verification of number of panels, panel type, size, orientation, tilt, and shading
  - Use approved solar access tools
  - Remote monitoring capability required, with mobile app





# Photovoltaic Systems Prescriptive Requirements

Single-family § 150.1(c)14

New for 2022

## Photovoltaic (PV) systems

- No larger than what can be installed in available solar access roof area (SARA) or per Equation 150.1-C
- SARA includes area of building's roof space, area of roof space on covered parking areas, carports, and other newly constructed structures on site that can structurally support PV system
- SARA does not include
  - Roof area with less than 70% annual solar access
    - Divides total annual solar insolation with shading, by total annual solar insolation without shading
  - Occupied roofs
  - Roof areas not available due to other building codes



# Photovoltaic Systems Prescriptive Requirements

Single-family § 150.1(c)14

Updated for 2022

## PV system exceptions

- Steep slope roofs areas with azimuth between 300 degrees and 90 degrees not included in SARA, no PV if SARA is less than 80 ft<sup>2</sup>
- No PV system when required PV size is less than 1.8 kWdc
- Areas with high snow loads where PV is not possible
- Buildings approved by AHJ prior to January 1, 2020
  - Shading from roof designs and configurations for steep-sloped roofs included in SARA
  - Roof areas that are not allowed to have PV, not considered in SARA
- PV system size reduced by 25% if battery storage system minimum 7.5 kWh installed per Reference Joint Appendix JA12



# Plan Check and Inspection

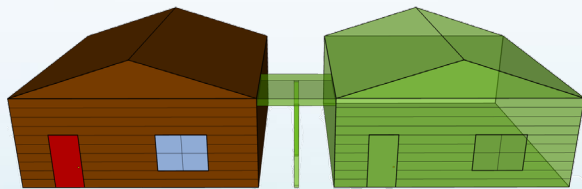


# Plan Check

Determine if building is a newly constructed building, addition, or alteration

## New Construction

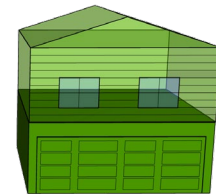
Detached new building



## Additions



Attached



Attached conversion



Detached conversion





# CF1R-PRF ADU Addition

## CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD

CF1R-PRF-01-E

Project Name: Example ADU

Calculation Date/Time: 2023-06-15T15:24:02-07:00

(Page 1 of 10)

Calculation Description: ADU Addition Alone

Input File Name: ADUExampleAdditionAlone.ribd22

GENERAL INFORMATION					
01	Project Name	Example ADU			
02	Run Title	ADU Addition Alone			
03	Project Location	715 P Street			
04	City	Sacramento, CA	05	Standards Version	2022
06	Zip code	95814	07	Software Version	CBECC-Res 2022.2.0
08	Climate Zone	12	09	Front Orientation (deg/ Cardinal)	0
10	Building Type	Single family	11	Number of Dwelling Units	1
12	Project Scope	Newly Constructed Addition	13	Number of Bedrooms	4
14	Addition Cond. Floor Area (ft <sup>2</sup> )	400	15	Number of Stories	1
16	Existing Cond. Floor Area (ft <sup>2</sup> )	2100	17	Fenestration Average U-factor	0.3
18	Total Cond. Floor Area (ft <sup>2</sup> )	2500	19	Glazing Percentage (%)	26.10%
20	ADU Bedroom Count	1			

ADDITION ALONE - Project Analysis Parameters					
01	02	03	04	05	06
Existing Area (excl. new addition) (ft <sup>2</sup> )	Addition Area (excl. existing) (ft <sup>2</sup> )	Total Area (ft <sup>2</sup> )	Existing Bedrooms	Addition Bedrooms	Total Bedrooms
2100	400	2500	3	1	4

ADDITION ALONE - ACCESSORY DWELLING UNIT (ADU) PROJECT ANALYSIS PARAMETERS							
01	02	03	04	05	06	07	08
Zone Name	Existing Area (excl. new addition) (ft <sup>2</sup> )	ADU Area (excl. existing) (ft <sup>2</sup> )	Total Area (ft <sup>2</sup> )	Existing Bedrooms	Addition Bedrooms	Total Bedrooms	Attached vs. Detached
ADU	2100	400	2500	3	1	4	Attached

Registration Number:

Registration Date/Time:

HERS Provider:

CA Building Energy Efficiency Standards - 2022 Residential Compliance

Report Version: 2022.0.000  
Schema Version: rev 20220901

Report Generated: 2023-06-15 15:24:15



# CF1R-PRF ADU Addition

**CERTIFICATE OF COMPLIANCE - RESIDENTIAL PERFORMANCE COMPLIANCE METHOD**

CF1R-PRF-01-E

**Project Name:** Example ADU

**Calculation Date/Time:** 2023-06-15T15:24:02-07:00

(Page 4 of 10)

**Calculation Description:** ADU Addition Alone

**Input File Name:** ADUExampleAdditionAlone.ribd22

ENERGY USE INTENSITY				
	Standard Design (kBtu/ft <sup>2</sup> - yr)	Proposed Design (kBtu/ft <sup>2</sup> - yr)	Compliance Margin (kBtu/ft <sup>2</sup> - yr)	Margin Percentage
Gross EUI <sup>1</sup>	48.79	47.75	1.04	2.13
Net EUI <sup>2</sup>	48.79	47.75	1.04	2.13

Notes

- Gross EUI is Energy Use Total (not including PV) / Total Building Area.
- Net EUI is Energy Use Total (including PV) / Total Building Area.

REQUIRED SPECIAL FEATURES
The following are features that must be installed as condition for meeting the modeled energy performance for this computer analysis.
<ul style="list-style-type: none"> <li>Cool roof</li> <li>Insulation below roof deck</li> <li>Window overhangs and/or fins</li> <li>Electric water heater exception - Exception 2 to Section 150.1(c)8</li> <li>Point of use</li> </ul>

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
<ul style="list-style-type: none"> <li>Quality insulation installation (QII)</li> <li>Indoor air quality ventilation</li> <li>Kitchen range hood</li> <li>Verified Refrigerant Charge</li> <li>Verified heat pump rated heating capacity</li> </ul>

ZONE INFORMATION						
01	02	03	04	05	06	07
Zone Name	Zone Type	HVAC System Name	Zone Floor Area (ft <sup>2</sup> )	Avg. Ceiling Height	Water Heating System 1	Status
ADU	Conditioned	HVAC System 1	400	8	DHW System	New

Registration Number:

Registration Date/Time:

HERS Provider:

CA Building Energy Efficiency Standards - 2022 Residential Compliance

Report Version: 2022.0.000  
Schema Version: rev 20220901

Report Generated: 2023-06-15 15:24:15



# Field Inspection

## For additions

- Require HERS verification 100% of the time
- Verify all forms are registered
- Ask for Project Status Report
- Ensure IAQ met


## For newly constructed buildings

- ADUs are no different than primary dwelling units
- Verify HERS inspections complete
- Verify all forms are registered
- Ask for Project Status Report
- If gas appliances, ensure heat pump ready
- Verify solar PV and ESS ready





# Project Status Report

PROJECT STATUS REPORT		CalCERTS, Inc	
Effective 09/23/2021 11:06		(Page 1 of 3)	
<b>GENERAL INFORMATION</b>			
Energy Standards Code Year:	2019	 <p>Easy to Verify @ calcerts.com</p>	
Project Name:	Smith Residence SFR		
Project Type:	New Construction SFR		
Address:	1111 Unicorn Lane		
City/State/Zip:	CalCERTSville / CA / 00000		
Enforcement Agency:	City of CalCERTSville		
Permit Number:	Permit 888		
OVERALL STATUS:	<b>NOT COMPLETE</b>		
HERS VERIFIABLE MEASURES:	<b>COMPLETE</b>		
<b>CF1R INFORMATION - Certificate of Compliance (Document Lists Required Energy Features)</b> ✓			
Certificate Type	Compliance		
Registered Form	CF1R-PRF-01		
Registered Date	2021-09-23 10:40:39		
Registration Number	221-P010199851A-000-000-0000000-0000		
<b>CF2R INFORMATION - Certificate of Installation (Documents the proper installation of required energy features)</b> ●			
System	Form	Registered Date	Registration Number
	CF2R-ENV-01-E Fenestration Installation	2021-09-23 10:57:46	221-P010199851A-000-001-E01001A-0000 Johnny Installer (DEV INSTALLERS &)
	CF2R-ENV-03-E Insulation Installation	2021-09-23 10:57:46	221-P010199851A-000-001-E03001A-0000 Johnny Installer (DEV INSTALLERS &)
	CF2R-ENV-21-H QII-Framing Stage	2021-09-23 10:57:46	221-P010199851A-000-001-E21001A-0000 Johnny Installer (DEV INSTALLERS &)
	CF2R-ENV-22-H QII-Insulation Installation	2021-09-23 10:57:46	221-P010199851A-000-001-E22001A-0000 Johnny Installer (DEV INSTALLERS &)
	CF2R-LTG-01-E Lighting	2021-09-23 10:57:47	221-P010199851A-000-001-L01001A-0000 Johnny Installer (DEV INSTALLERS &)

- Summarizes status of all required forms
- Available for all projects registered with HERS provider
- Online access to registry
- Request hard copy at final inspection to verify compliance
- HERS and overall status marked **Complete** to pass inspection



# Resources





# HCD ADU Resources



California Department of Housing and  
Community Development

## Accessory Dwelling Unit Handbook



Where foundations begin

Updated December 2020

- [HCD Accessory Dwelling Unit Handbook](#)
- [HCD Factory Built Housing](#)



# Blueprint Newsletter

## Energy Code quarterly newsletter

- Updates
- Clarifications
- Frequently asked questions
- ADU resources
  - BP #122-124
  - BP #127
  - BP #129-135
  - BP #139
  - BP #141

Issue 141 | January - March 2023

## BLUEPRINT

CALIFORNIA ENERGY COMMISSION  
EFFICIENCY DIVISION

### In This Issue

- CalAPP Program Grants
- SARA Calculations for PV
- Battery Sizing Examples
- Demand Response Controls
- Compliance Software
- Q&A
  - Solar Ready
  - Single-Family Energy Storage Ready
  - Nonresidential Dehumidifiers
  - Nonresidential and Multifamily Roof Alterations

### CalAPP Program Grants

The California Automated Permit Processing (CalAPP) program application deadline is May 1, 2023. Applying reserves the grant funds for California cities and counties to establish online solar permitting, such as SolarAPP+.

The jurisdiction has until 2027 to complete the grant activities and receive reimbursement. As of March 1, 2023, more than \$6 million in grant awards are approved for 110 jurisdictions.

If the jurisdiction has already adopted an online solar permitting platform, there still may be opportunities to receive funding. Some acceptable grant activities include:

- Training events for staff and local installers.
- Maintenance costs, which can include adding support for permitting of energy storage paired with solar energy systems.
- Up to three years of subscription costs for the software database that supports the newly adopted platform.

### SARA Calculations for PV

Please review the solicitation manual and terms and conditions before completing an application. Visit the [CalAPP program webpage](#) for program documents, common questions, and the application form.

The California Energy Commission (CEC) has posted a regulatory advisory to clarify requirements in the 2022 Building Energy Efficiency Standards (Energy Code) for the solar access roof area (SARA) calculations. When there is another part of the California Building Code that requires roof area to be left clear, those areas do not need to be included in SARA. See the [SARA regulatory advisory](#) for more information.

### Battery Sizing Examples

The 2022 Energy Code [§ 140.10](#) and [§ 170.2\(g-h\)](#) have prescriptive requirements for solar photovoltaic (PV) and battery storage systems for newly constructed nonresidential and high-rise multifamily buildings, respectively. The minimum

The CEC welcomes feedback on Blueprint. Please contact the editor at [Title24@energy.ca.gov](mailto:Title24@energy.ca.gov)

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# Single-family Summary

## What's New for Single-family

- Summary of significant changes
- Code references
- Mandatory requirements summary is also available
- Download from the [Online Resource Center](#)



California Energy Commission  
2022 Building Energy Efficiency Standards  
What's New for Single-Family Residential

### Single-Family What's New for 2022 Summary

The most significant change in the 2022 Building Energy Efficiency Standards (Energy Code) affecting single-family residential buildings is a single fuel prescriptive heat pump baseline for either water heating or space heating, depending on the climate zone. There are significant changes in requirements for indoor air quality (IAQ). There are also new requirements and revisions for additions and alterations. The definition for single-family buildings is updated and all multifamily requirements are moved to Sections 160.0 to 180.4.

### Mandatory Requirements

- New roof deck insulation maximum area-weighted average U-factor requirement of U-0.184 in climate zones 4 and 8-16. §150.0(a)1
- Simplifies hot water piping language and defers to California Plumbing Code. §150.0(g)
- Simplifies and reorganizes language for lighting requirements. §150.0(k)
- Ducts in conditioned space do not require insulation if specific criteria are met, and ducts are located entirely inside the building's thermal envelope. §150.0(m)1B
- Filter racks or grilles shall be gasketed or sealed to prevent air from bypassing the filter. §150.0(m)12Bv
- Gas water heater installations must provide a designated space for a future heat pump water heater (HPWH) installation. §150.0(n)
- New requirements for central fan integrated ventilation systems requiring a motorized controlled damper, damper controls, and variable ventilation. §150.0(o)1B
- Vented kitchen range hoods require ventilation rates or capture efficiencies based on conditioned floor area and fuel type (see Tables 150.0-E, F, & G). §150.0(o)1G
- Installed heat recovery ventilation (HRV) and energy recovery ventilation (ERV) systems must have a Home Energy Rating System (HERS) verified maximum fan efficacy of 1.0 W/cfm. §150.0(o)2C
- New energy storage system (ESS) ready requirements, including interconnection equipment or a dedicated raceway, a minimum of four branch circuits, a minimum busbar rating of 225 amps, and space for future installation of a system isolation equipment or transfer switch. §150.0(s)
- New electric ready requirements for space heating, cooking, and clothes dryers when gas equipment is installed. Electrical infrastructure must be provided and reserved to the equipment location for the future installation of electrical appliances. §150.0(t)-(v)

### Performance Compliance:

- New energy design rating (EDR) metrics – EDR1, based on source energy; efficiency EDR and solar generation/flexibility EDR are now under EDR2. Compliance requires separately meeting EDR1, efficiency EDR2, and total EDR2. §150.1(b)1

### Prescriptive Compliance:

- Space heating equipment must be a heat pump in climate zones 3, 4, 13, and 14. In other climate zones it can be either a heat pump or a gas heating system. §150.1(c)6
- Water heating equipment must be a HPWH meeting certain criteria or solar water heating system with electric backup. §150.1(c)8
- In climate zones 3, 4, 13, and 14, a gas instantaneous water heater (max input 200,000 Btu/h, no storage tank) is allowed if the space conditioning system is a heat pump. §150.1(c)8
- New dwelling units with a conditioned floor area 500 square feet (SF) or less may install an instantaneous electric water heater with point of use distribution. §150.1(c)8
- New dwelling units with a conditioned floor area 500 SF or less do not require a whole-house fan. §150.1(c)12
- Revises and updates photovoltaic (PV) language for clarity, including solar access roof area (SARA). §150.1(c)14



# Online Resource Center

[www.energy.ca.gov/orc](http://www.energy.ca.gov/orc)



## Handouts

- Fact sheets
- Guides

## Tools

- Checklists
- Blueprint newsletter

## Training

- Presentations
- Videos

## Links

- Internal resources
- External resources



# HERS Program

## HERS Program information



- Newly constructed buildings
- Additions
- Alterations of residential and nonresidential buildings
- California whole-house home energy ratings
- HERS building performance contractors



- Newly constructed buildings
- Additions
- Alterations of residential and nonresidential buildings



# Stay Connected

## Receive Energy Code updates

- [Subscribe to Efficiency Division emails](#)
  - Appliances
  - Blueprint
  - Building Standards
- Respond to confirmation email

## Follow the California Energy Commission





# Energy Code Hotline

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Monday through Friday

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

Call

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

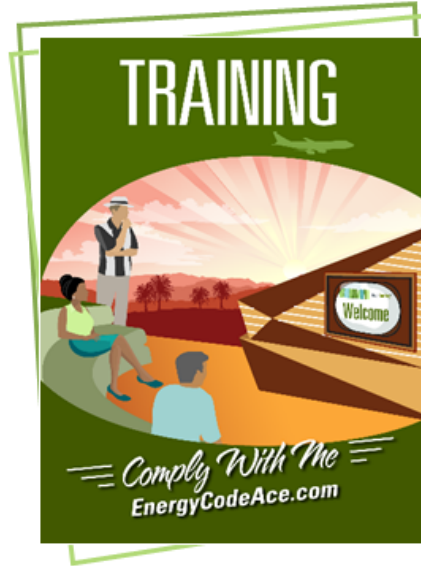


Email

- [Title24@energy.ca.gov](mailto:Title24@energy.ca.gov)



# Energy Code Ace



- Tools help automate tasks:**
- ✦ Energy Code Product Finder
  - ✦ Forms Ace
  - ✦ Image Ace
  - ✦ Navigator Ace
  - ✦ Nonres. Indoor Lighting Wheel
  - ✦ Q&Ace
  - ✦ Reference Ace
  - ✦ Timeline Ace
  - ✦ Virtual Compliance Assistant

- Training is activity based and delivered in a variety of formats:**
- ✦ Live Online instructor-led
  - ✦ Online self-study
  - ✦ Recorded webinars
  - ✦ YouTube — live streaming & videos

- Resources provide quick, useful guidance:**
- ✦ Fact Sheets
  - ✦ Checklists
  - ✦ Application Guides
  - ✦ Submit a Question
  - ✦ Trigger Sheets
  - ✦ Useful Links

Join us at [EnergyCodeAce.com](http://EnergyCodeAce.com)



**Thank you**