

# BLUEPRINT

CALIFORNIA ENERGY COMMISSION  
EFFICIENCY DIVISION

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## 2022 Energy Code: Single-Family Summary

The most significant change in the 2022 Building Energy Efficiency Standards (Energy Code) affecting single-family residential buildings is a prescriptive heat pump baseline for either water heating or space heating, depending on the climate zone. The ventilation requirements are strengthened to improve indoor air quality. There are new requirements and revisions for additions and alterations. The definition for single-family buildings in § 100.1 is updated. These and other significant changes include:

### *Mandatory Requirements*

- Adds roof deck insulation with maximum area-weighted average U-factor 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(j)
- Simplifies and reorganizes language for lighting requirements. § 150.0(k)
- Clarifies ducts in conditioned space do not require insulation when specific criteria are met, and ducts are located entirely inside the thermal envelope of the building. § 150.0(m)1B
- Adds filter racks or grilles shall be gasketed or sealed to prevent air from bypassing the filter. § 150.0(m)12Bv
- Updates gas water heater installations need to designate a space for a future heat pump water heater (HPWH). § 150.0(n)
- Adds requirements for central fan integrated (CFI) ventilation systems, specifying controlled, motorized outdoor air dampers. § 150.0(o)1B
- Updates vented kitchen range hood ventilation rates or capture efficiencies based on conditioned floor area and fuel type per Tables 150.0-E, F, G. § 150.0(o)1G

- Adds 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 watts per cfm. § 150.0(o)2C
- Adds 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 system isolation equipment or a transfer switch. Figures 1-2. § 150.0(s)

- Adds electric ready requirements for space heating, cooktops, 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

- Updates energy design rating (EDR) metric. EDR1 is based on hourly source energy. The efficiency EDR and photovoltaic (PV)/flexibility EDR, based on the time dependent valuation (TDV) energy, are now under EDR2. Compliance requires separately meeting EDR1, efficiency EDR2, and total EDR2. § 150.1(b)1

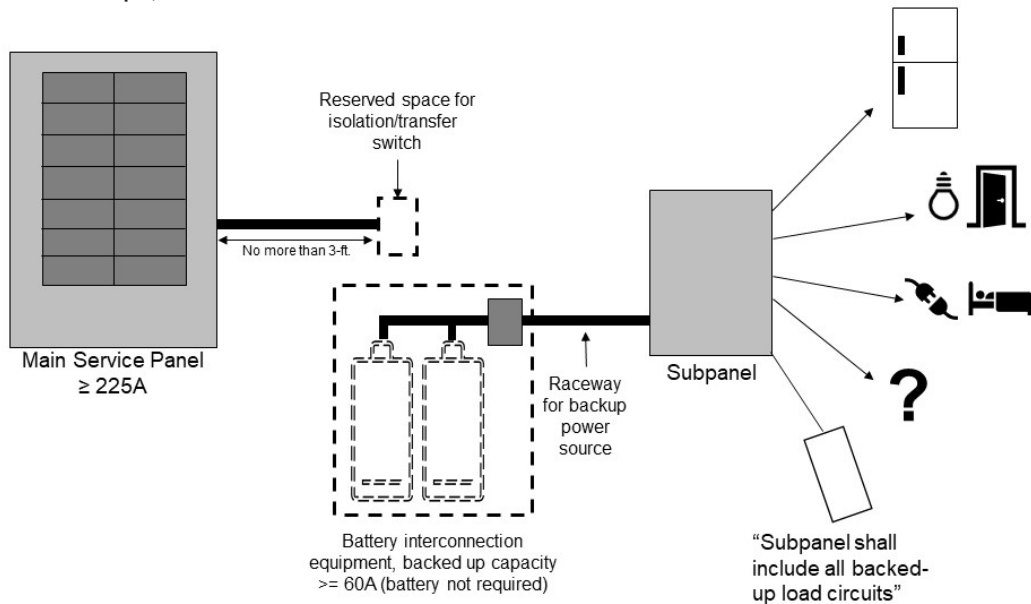


Figure 1: Energy Storage System Ready Configuration per § 150.0(s)1A

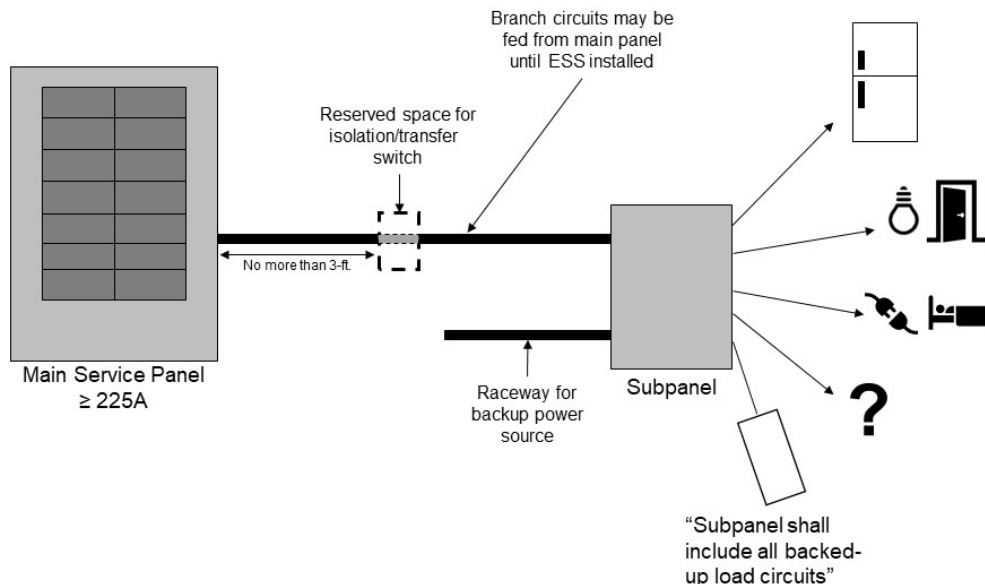


Figure 2: Energy Storage System Ready Configuration per § 150.0(s)1B

## Prescriptive Compliance

- Adds requirement for heat pump space heating equipment in climate zones 3, 4, 13, and 14. In other climate zones, either a heat pump or a gas heating system may be used. § 150.1(c)6
- Adds water heating equipment must be a HPWH meeting certain criteria or a solar water-heating system with electric backup. § 150.1(c)8
- Adds exception for climate zones 3, 4, 13, and 14 to allow a gas instantaneous water heater (maximum input 200,000 Btu per hour, no storage tank) when the space-conditioning system is a heat pump. § 150.1(c)8
- Adds exception for new dwelling units with a conditioned floor area of 500 square feet or less to allow an instantaneous electric water heater with point of use distribution. § 150.1(c)8
- Adds exception to whole-house fans for new dwelling units with a conditioned floor area of 500 square feet or less. § 150.1(c)12
- Clarifies PV language; adds solar access roof area (SARA) definition and method of calculation. § 150.1(c)14
- Adds exception that no PV system is required when size is less than 1.8 kWdc per the available SARA or using Equation 150.1-C. § 150.1(c)14

## Additions and Alterations

- For additions:
  - Updates duct leakage testing applicable when extending any length of existing ducting. § 150.2(a)
  - Adds new or replacement space heating equipment serving an addition may be a heat pump or gas heating system. § 150.2(a)
  - Updates roof and ceiling insulation in a vented attic for additions less than 700 square feet: in climate zones 1, 2, 4, and 8-16 maximum overall assembly U-factor of 0.025 (R-38 in a wood-frame), in climate zones 3 and 5-7 maximum overall assembly U-factor of 0.031 (R-30 in a wood-frame). § 150.2(a)1Bi
  - Adds exception from the whole-dwelling unit mechanical ventilation for additions of junior accessory dwelling units (JADU) that are 500 square feet or less, contained entirely within an existing single-family building. § 150.2(a)1Cia2
  - Updates water heater options for more specificity across all types. § 150.2(a)1D
- For alterations:
  - Updates duct leakage testing trigger when more than 25 feet of ducts are replaced or installed. § 150.2(b)1D
  - Expands HPWH requirements to all climate zones. § 150.2(b)1Hiii
  - Updates exception allowing a consumer electric water heater to replace an existing electric resistance water heater. § 150.2(b)1Hiii
  - Expands roof replacement efficiencies to additional climate zones. § 150.2(b)1I
  - Adds roof deck insulation for low-sloped roofs, including exceptions. § 150.2(b)1Iiib
  - Adds ceiling insulation for vented attics. § 150.2(b)1J
  - Revises indoor air quality and mechanical exhaust requirements to clarify applicability for alterations. § 150.2(b)1L-M
  - Adds requirement for alterations that increase exterior door area to meet U-factor. § 150.2(b)1N

View and download the 2022 Energy Code documents on the [2022 Energy Code webpage](#).



## 2022 Energy Code: New Summaries on the ORC

New resources for the 2022 Energy Code are available on the **Online Resource Center overview webpage**.

- Single-Family Mandatory Requirements Summary
- Single-Family What's New Summary
- Multifamily What's New Summary
- Nonresidential What's New Summary

## Q&A

### ESS Ready for ADUs

**Does a newly constructed accessory dwelling unit (ADU) need to comply with the ESS ready requirements in § 150.0(s) of the 2022 Energy Code?**

Yes. A newly constructed residential building that includes a dwelling unit of any size must meet the energy storage system ready requirements per § 150.0(s). The ADU must also meet the electric ready requirements in § 150.0(t)-(v) when installing gas appliances.

**Do other types of newly constructed buildings on a residential site need to meet the ESS ready requirements?**

No. If the new residential building does not include a dwelling unit, such as a pool house, art studio, office, etc., it will not need to meet the ESS ready requirements.

## ENERGY STANDARDS HOTLINE

Available to help with Energy Code (Title 24, Part 6) questions.

✉ EMAIL  
title24@energy.ca.gov

☎ CALL  
800-772-3300 | 916-654-5106  
Toll free in CA | Outside CA

HOURS 8 a.m.–12 p.m. and 1 p.m.–4:30 p.m.

### Single-Family Water Heating Alterations

**Is a HPWH allowed when replacing a water heater under the 2022 Energy Code?**

Yes. The 2022 Energy Code § 150.2(b)1Hiii allows HPWHs in all climate zones. A demand responsive HPWH with the storage tank not located outdoors, on rigid R-10 insulated surface will comply, or a HPWH that meets NEEA Tier 3 or higher.

**Will a gas water heater replacement comply prescriptively with the 2022 Energy Code?**

Yes. Natural gas or propane water heaters are allowed for water heater replacements in the 2022 Energy Code per § 150.2(b)1Hiiia.

**Does an electric resistance water heater comply prescriptively with the 2022 Energy Code?**

Yes. When replacing an existing electric resistance water heater, a new consumer electric water heater is allowed per § 150.2(b)1Hiiid. However, HPWHs are the more efficient option for an electric water heater replacement.

### Single-Family Water Heating for ADUs

**Does an all-electric ADU that is an addition have any alternatives when there is not enough space for a HPWH?**

Yes. In the 2022 Energy Code § 150.2(a)1Div, if the ADU addition is no larger than 500 square feet, an electric tankless water heater may be used prescriptively, with point of use distribution per RA4.4.5.

**If an all-electric ADU is newly constructed, are there alternatives when there is not enough space for a 240V HPWH?**

Yes. In the 2022 Energy Code an exception to § 150.1(c)8 allows a newly built dwelling unit with 500 square feet or less to install an instantaneous electric water heater with point of use distribution per RA4.4.5. An exception to § 150.1(c)8A and B allows a new dwelling unit with one bedroom or less to install a 120V HPWH in place of a 240V HPWH.

## Single-Family Ceiling Insulation Alterations

### Does altering a ceiling trigger the new insulation requirements in the 2022 Energy Code?

Yes. The attic insulation and air sealing prescriptive requirements per § 150.2(b)1J apply to vented attics in most climate zones when the ceiling above a conditioned space is altered. A ceiling may be considered altered under various conditions including when the existing attic insulation is replaced, new attic insulation is added, or the ceiling plane is replaced.

### Does adding or replacing HVAC in a vented attic trigger the new insulation requirements?

Yes. The attic insulation and air sealing prescriptive requirements per § 150.2(b)1J apply when an entirely new or complete replacement duct system is installed in a vented attic per § 150.2(b)1Dii.

### Are there exceptions to the ceiling insulation and air sealing requirements in § 150.2(b)1J?

Yes. There are several exceptions depending on the climate zone and existing conditions in the attic.

## Single-Family Lighting

### Will lighting sources labeled JA8-2016 and JA8-2019 be allowed for 2022 Energy Code compliance?

Yes. The stringency of the performance requirements for JA8 certification remains consistent. All three labels, JA8-2016, JA8-2019, and JA8-2022, indicate that the minimum performance standards meet or exceed the 2022 Energy Code. This also includes the labels for elevated temperatures.

For additional help with the Energy Code, see Energy Code Ace's **online offerings** of trainings, tools, and resources.



## FOR MORE INFORMATION

### Online Resource Center (ORC):

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

### Home Energy

### Rating System (HERS):

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

### Acceptance Test Technician Certification Provider Program

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

### 2019 Approved

### Compliance Software:

<https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2019-building-energy-efficiency-2>

## EDITOR

Amie Brousseau

## SPECIAL THANKS

Christine Collopy

Che Geiser

Chris Olvera

Armando Ramirez

Michael J. Sokol

Danny Tam

Will Vicent

RJ Wichert

Allen Wong

## Building Standards Office

715 P Street  
Sacramento, CA  
95814

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CEC-400-2022-015

