Issue 140 | October - December 2022

BLUEPRINT

CALIFORNIA ENERGY COMMISSION

EFFICIENCY DIVISION

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2019 Energy Code: SEER2 Guidance

The U.S. Department of Energy's (DOE) published **final rule of increased efficiency standards** for residential air conditioners and heat pumps takes effect on January 1, 2023. The updated **DOE test procedure (PDF)** is used to determine new product efficiency ratings and is intended to be more representative of installations in homes. The current ratings will no longer be used for seasonal energy efficiency ratio (SEER), energy efficiency ratio (EER), and heating seasonal performance factor (HSPF). These efficiencies will be replaced by new SEER2, EER2, and HSPF2 ratings. This new system of measurement will apply to all single-phase air conditioners and heat pumps less than 65,000 Btu per hour.

Central air conditioners that are installed on or after January 1, 2023, must comply with the new DOE regional standards. The new standards apply to heat pump equipment manufactured on or after January 1, 2023. HVAC manufactures have been preparing for these changes and have products using the SEER2, EER2, and HSPF2 ratings.

To address projects permitted under the 2019 Building Energy Efficiency Standards (Energy Code), when the equipment has a SEER rating, but the equipment installed must use the new SEER2 rating, use the conversion in Table 1. The conversions provided in Table 1 are only to be used for the purpose of documenting compliance with the 2019 Energy Code. Equipment must be verified as compliant with the federal standards based on the actual ratings for SEER2.

For example, in a scenario where SEER rated equipment is specified in the project design on the 2019 residential certificate of compliance (CF1R) and equipment with only a SEER2 rating is installed and reported on the certificate of installation (CF2R), Table 1 may be used to convert the manufacturer's SEER2 rating value to a SEER rating value to determine if the installed equipment complies.

System Type	Equation
Split system air conditioner < 45,000 Btu/h	SEER = SEER2 X 1.049
	EER = EER2 X 1.043
Split system air conditioner ≥ 45,000 Btu/h	SEER = SEER2 X 1.051
	EER = EER2 X 1.045
Split system heat pump	SEER = SEER2 X 1.049
	HSPF = HSPF2 X 1.173
Packaged air conditioner and heat pump	SEER = SEER2 X 1.045
	EER = EER2 X 1.038
	HSPF = HSPF2 X 1.176
Space constrained air conditioner	SEER = SEER2 X 1.026
Space constrained heat pump	SEER = SEER2 X 1.008
	HSPF = HSPF2 X 1.175
Small duct high velocity system	SEER = SEER2 X 1.000
	HSPF = HSPF2 X 1.180

Table 1: Equations to Convert Respective Ratings for the 2019 Energy Code
Source: California Energy Commission

The installer should perform the conversion when completing the CF2R. The actual SEER2 rating value must be included in the form notes as "SEER2 rating = XX.X" and the converted SEER rating value must be entered in the efficiency value field. The building official should confirm that the SEER2 rating of the equipment installed on site matches the SEER2 rating value included in the form notes and that the SEER rating value is converted accurately using Table 1. The same method can be used to demonstrate compliance for the EER2 and HSPF2 ratings.

All projects submitted under the 2022 Energy Code will use the new ratings for SEER2, EER2, and HSPF2. The 2022 Energy Code standard design uses the new DOE standard minimum efficiencies.

2022 Energy Code: Compliance Software

Approved updated versions of the 2022 Energy Code compliance software are available on the **2022 Energy Code compliance software webpage**.

- For single-family buildings
  - CBECC-Res 2022.2.0
- For nonresidential and multifamily buildings
  - CBECC 2022.2.0

All permit applications submitted on or after January 1, 2023, will need to comply using software and forms approved for the 2022 Energy Code. The previous software versions CBECC 2022.1.0 and CBECC-Res 2022.1.0 will expire. Please visit the **compliance software webpage** for the latest versions of the software and software expiration dates.

2022 Energy Code: Compliance Documents

Certificate of compliance documents (forms) that can be used to demonstrate performance compliance with the 2022 Energy Code are available through the approved software programs. Document registration with an approved residential data registry is required by the 2022 Energy Code **§ 10-103(a)** for newly constructed buildings and additions or alterations to existing buildings.

Single-Family Residential Compliance Forms

Prescriptive CF1R and CF2R fillable forms for non-HERS additions and alterations are available on the **2022 Energy Code webpage**. Prescriptive CF1R, CF2R, and CF3R forms for all projects with HERS measures need to be completed through the Home Energy Rating System (HERS) providers registry.

Registration of the 2022 Energy Code single-family residential and nonresidential compliance documents are expected to be available January 1, 2023, through approved data registries.

Low-Rise Multifamily Compliance Forms

Prescriptive LMCC, LMCI, and LMCV fillable forms for low-rise multifamily buildings are available on the **2022 Energy Code webpage** until the forms can be registered with an approved residential data registry.

The LMCC, LMCI, LMCV will have a **delayed availability (PDF)** to be registered through the approved HERS data registries pending development by CalCERTS and CHEERS. It is expected that the low-rise multifamily data registries will be available in spring of 2023.

Enforcement agencies should:

- Accept, review, and approve plans and unregistered LMCCs until an approved residential data registry capable of processing these forms becomes available.
- Ensure that the multifamily compliance software used is approved by the CEC for demonstrating compliance with the 2022 Energy Code.
- Retain digital or paper copies of the documents submitted for eventual registration.
- Confirm that LMCCs are registered before a permit is final or a certificate of occupancy is issued.

Nonresidential Compliance Forms

Prescriptive NRCC, NRCI, and NRCA fillable forms are available through the **2022 Energy Code webpage**. NRCA fillable forms ending in F must be completed by a field technician. NRCA forms ending in A will need to be completed by a Certified Acceptance Test Technician (ATT) through the certification provider's website. NRCV forms must be completed through the HERS providers registry.

For more info visit the **HERS webpage** and the **ATTCP webpage**.

Compliance Document Signatures

The documentation author and responsible person must sign the residential certificates of compliance (CF1R/LMCC), installation (CF2R/LMCI), and verification (CF3R/LMCV) per § 10-103 of the 2022 Energy Code. Each compliance form has two signature blocks. The first is the declaration statement for the documentation author, and the second block is for the responsible person.

The documentation author is the person that completes the form by performing a service under the authority of the person with overall project responsibility. Their signature certifies that the information entered on the form is accurate and complete. There are no licensing or training requirements for a documentation author. After the documentation author signs the form, it must be reviewed and signed by the responsible person.

The responsible person is the person who accepts responsibility for complying with the Energy Code. The responsible person for each compliance form is as follows:

- CF1R/LMCC: The responsible person accepts responsibility for the building design, such as a primary installing contractor, building owner or builder, a certified energy analyst, architect, or engineer.
- CF2R/LMCI: The responsible person accepts responsibility for the construction or installation of features, materials, components, or manufactured devices regulated by the Energy Code such as the general contractor or primary installer. Only installation forms have the option for a delegated signature authority.
- CF3R/LMCV: The responsible person is the HERS Rater who accepts responsibility for performing field verification and diagnostic testing. Only HERS Raters may be responsible for verification.

HERS Raters are not intended to sign as a project's responsible person on the CF1R/LMCC. While the Business and Professions Code does not prevent HERS Raters from accepting this responsibility, there is the risk of a conflict of interest as defined by the HERS regulations.

HERS Raters must remain independent entities from the builder and subcontractors who install energy efficient features, per Title 20 § 1673(j)(2). HERS Raters can charge for testing features and completing forms to sustain their business.

HERS Raters may sign the CF2R/LMCI as the responsible person using installer-delegated signature authority. HERS Raters may complete and sign most forms as the document author.

Nonresidential Acceptance Testing

The CEC has approved the 2022 Energy Code application updates of these **Acceptance Test Technician Certification Providers (ATTCP)** to train, certify, and recertify acceptance test technicians (ATT) and their employers:

- California Advanced Lighting Controls Training Program (CALCTP)
- National Lighting Contractors Association of America (NLCAA)
- California State Pipe Trades Council (CSPTC)
- National Environmental Balancing Bureau (NEBB)
- National Environmental Management Institution Committee (NEMIC)
- Refrigeration Service Engineers Society (RSES)

Mechanical acceptance testing must be completed by an approved mechanical ATT for nonresidential projects with permits applications submitted on or after October 1, 2021. Free training for inspectors and building officials is available through approved ATTCPs.

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

2022 Energy Code: New Resources on the ORC

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

- 2022 Water Heater Efficiency Guide
- 2022 Single-Family Residential Water Heater Alterations

Q&A

Air Conditioning System Changeouts

Do replacement HVACs need to meet the new DOE minimum efficiency requirements for projects changing out the air conditioning unit in an existing home?

Yes. The DOE has set regional minimum SEER2 and EER2 requirements that are effective based on the date a unit is installed. These requirements are applicable to split system and single package central air conditioners installed on or after January 1, 2023. Projects installing one of these types of units on or after this date must meet both the minimum SEER2 and EER2 requirements.

Can a heat pump without a SEER2 rating be installed as a replacement HVAC?

Yes. If the heat pump was manufactured before January 1, 2023, and meets the required efficiencies, it may be installed. The new DOE's SEER2 and HSPF2 standards apply to heat pump units manufactured on or after January 1, 2023. The DOE's date of installation requirement is only applicable to split system air conditioners. All heat pump equipment minimum efficiency requirements are based on the date of manufacture, not date of installation.

Vented Range Hood Alterations

Does an alteration or replacement of a vented range hood require HERS verification under the 2022 Energy Code?

No. Per the 2022 Energy Code § **150.2(b)1Miib**, alterations or replacements of a vented range hood alone (using existing ducts) does not require HERS verification. However, per the 2022 Energy Code **§ 150.2(b)1L** an entirely new vented range hood and new or complete replacement ducts must meet the mandatory requirements in § **150.0(o)**, which will include HERS verification.

The CEC welcomes feedback on Blueprint. Please contact the editor at **Title24@energy.ca.gov**

PV for Nonresidential Tenant Improvements

Do the nonresidential PV and battery storage requirements in the 2022 Energy Code apply to a new tenant improvement (first time build-out) in a multi-tenant building?

Yes. First time tenant improvements (TI) for individual spaces where the building space has never been used or occupied for any purpose meets the definition of a newly constructed building per the Energy Code **§ 100.1**. The 2022 Energy Code requirements apply to permit applications for first time TIs for each space in a building that are submitted on or after January 1, 2023. All newly constructed building types specified in **Table 140.10-A** must meet the applicable PV and energy storage system requirements of **§ 140.10** of the 2022 Energy Code. Some exceptions may apply. The building space occupancy status is determined by the local enforcement agency.

Do the nonresidential PV and battery storage requirements in the 2022 Energy Code apply to unleased tenant spaces in a newly constructed multi-tenant building?

Yes. Unleased tenant spaces in newly constructed multi-tenant buildings must comply with the PV and battery storage requirements per the capacity factors in **Table 140.10-A** and **Table 140.10-B**. A mixed occupancy building where at least 80 percent of the floor area is one or more of the specified types must comply. If the building includes more than one of the space types listed in **Table 140.10-A**, the total PV system required is the combined capacities determined for each type. Some exceptions may apply.

Do the nonresidential PV and battery storage requirements in the 2022 Energy Code apply to a tenant improvement in a tenant space that was previously occupied?

No. A tenant improvement in an existing building tenant space that was previously occupied would be considered an alteration. Alterations need to comply with the applicable requirements in **§ 141.0(b)** depending on the scope of work. An alteration is any change to a component that is regulated by the Energy Code, including water-heating system, ventilation system, space-conditioning system, indoor, outdoor, and sign lighting, electrical power distribution system, envelope, and any covered process. For alterations that change the occupancy classification of the tenant space, the requirements per § 141.0 apply to the new occupancy type.

Unconditioned Space in PV Calculations

Is unconditioned space in a nonresidential building included in the PV calculation when 80 percent or more of the entire building floor area, both conditioned and unconditioned, is a building space type listed in Table 140.10-A of the 2022 Energy Code?

No. Unconditioned floor area is considered part of the 80 percent trigger for spaces listed in **Table 140.10-A** for the nonresidential PV requirements. However, only the conditioned floor area of the spaces listed in **Table 140.10-A** are considered when calculating the required PV system size per **Equation 140.10-A**. SARA must also be calculated and multiplied by 14 Watts per square foot. The smaller of the two calculations determines the PV system size, or required PV as calculated using approved software in the performance approach. Some exceptions may apply.

Multifamily 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 **§ 180.2(b)1Bi** 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 **§ 180.2(b)1Bi** apply when an entirely new or complete replacement duct system is installed in a vented attic per **§ 180.2(b)2Aiial**.

Are there exceptions to the ceiling insulation and air sealing requirements in § 180.2(b)1Bi?

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

ENERGY STANDARDS HOTLINE

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

EMAIL
title24@energy.ca.gov

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

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

FOR MORE INFORMATION

Online Resource Center (ORC): www.energy.ca.gov/orc

Home Energy Rating System (HERS): www.energy.ca.gov/HERS

Acceptance Test Technician Certification Provider Program (ATTCP): 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

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Blueprint newsletter serves as a resource to assist stakeholders in complying with the Energy Code. It does not provide legal advice. Please refer to California Code of Regulations, Title 24, Parts 1 and 6 for specific requirements.

CALIFORNIA ENERGY COMMISSION
CEC-400-2022-019