



We will be starting soon!

Thanks for joining us





Introduction to the Energy Code

Jennifer Rennick, AIA, CEA – In Balance Green Consulting

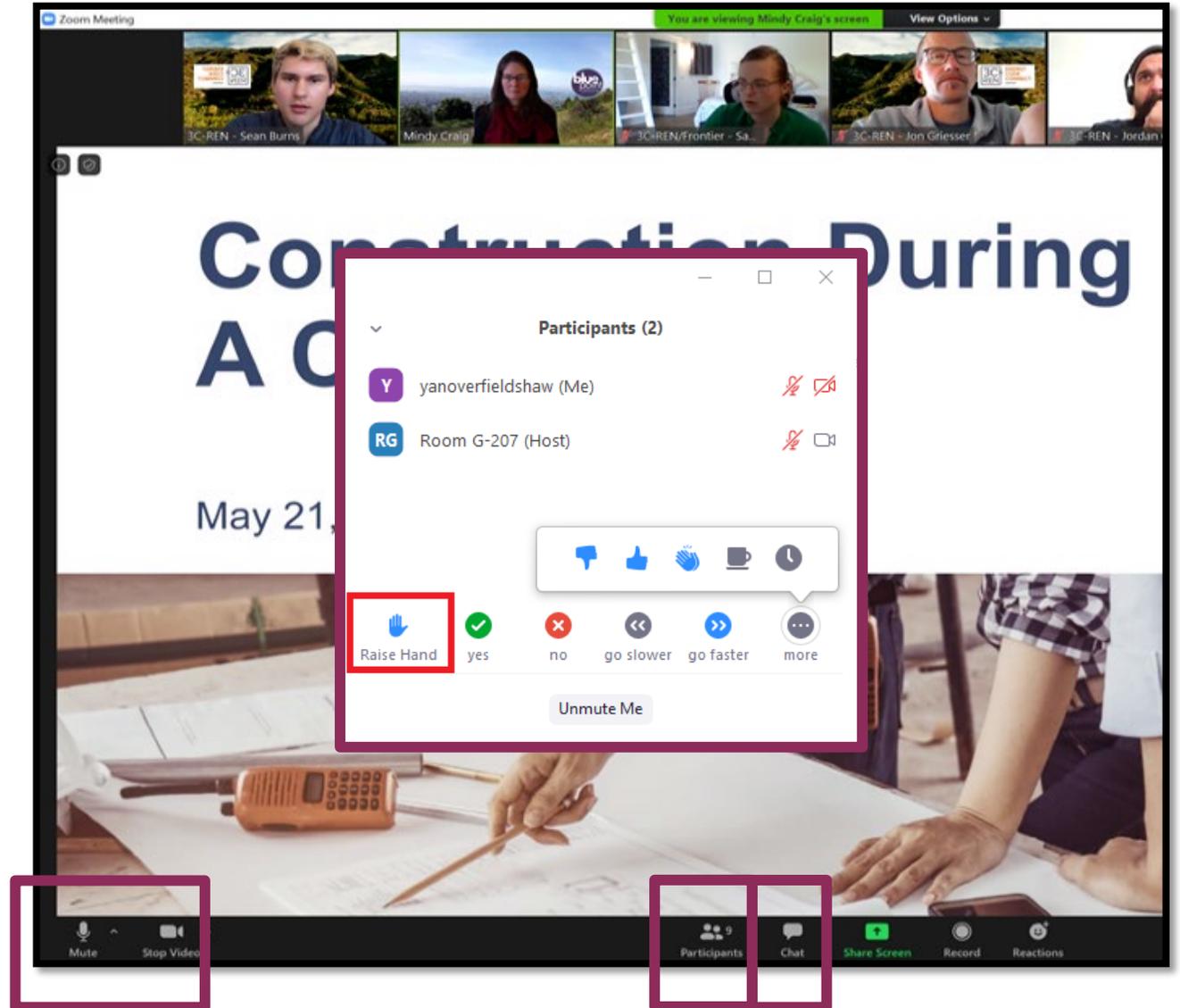
Grant Murphy, CEA – In Balance Green Consulting

January 11, 2024



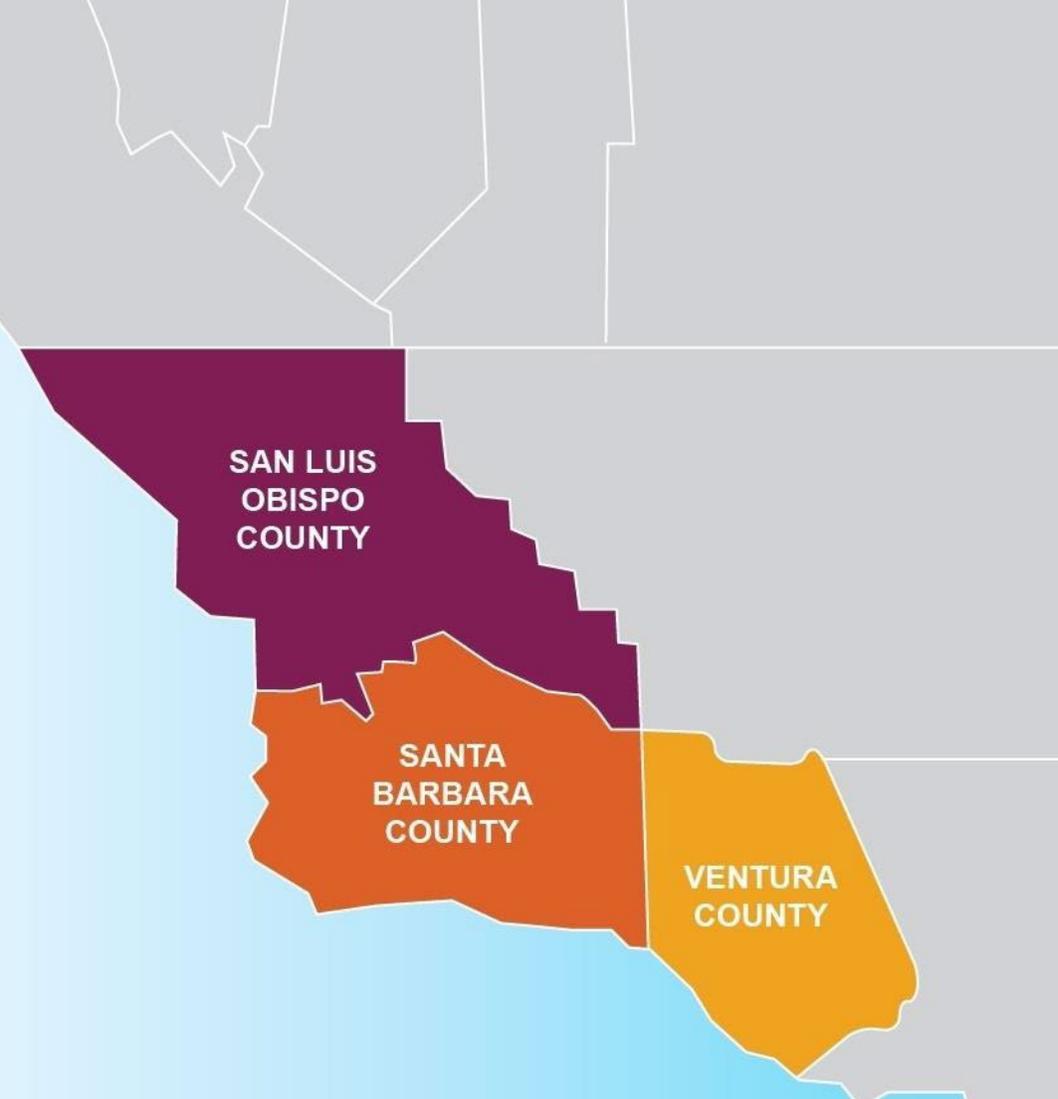
Zoom Orientation

- Please be sure your full name is displayed
- Please **mute** upon joining
- Use "Chat" box to share questions or comments
- Under "Participant" select "Raise Hand" to share a question or comment verbally
- The session may be **recorded** and posted to 3C-REN's on-demand page. Feel free to ask questions via the chat and keep video off if you want to remain anonymous in the recording.



3C-REN: Tri-County Regional Energy Network

- Three counties working together to improve energy efficiency in the region
- Services for –
 - **Building Professionals:** industry events, training, and energy code compliance support
 - **Households:** free and discounted home upgrades
- Funded by ratepayer dollars that 3C-REN returns to the region





ENERGY
CODE
CONNECT

- Serves all building professionals
- Three services –
 - **Energy Code Coach**
 - **Training and Support**
 - **Regional Forums**
- Makes the Energy Code easy to follow

Energy Code Coach:
3c-ren.org/codes
805.781.1201

Event Registration:
3c-ren.org/events





BUILDING PERFORMANCE TRAINING

- Serves current and prospective building professionals
- Expert instruction:
 - **Technical skills**
 - **Soft skills**
- Helps workers to thrive in an evolving industry

Event Registration:
3c-ren.org/events





HOME
ENERGY
SAVINGS

Multifamily (5+ units)

- No cost technical assistance
- Rebates up to \$750/apartment plus additional rebates for specialty measures like heat pumps

Single Family (up to 4 units)

- Sign up to participate!
- Get paid for the metered energy savings of your customers

Enrollment:
3C-REN.org/contractor-participation



Learning Objectives

- Understand what the Building Energy Efficiency Standards code is and why we have one in California
 - Learn how the energy code is organized and where to find the information you need
 - Recognize key energy requirements that can inform building design, plan review and construction decisions
 - Know where to get help quickly for your energy code questions
-
- 1.5 AIA HSW LU approved for this course
 - 0.15 ICC CEU approved for this course



Course Overview

Historical Context: Why we have building energy efficiency standards in California.

California's Energy Code: State, National, and local jurisdictional context.

Energy Code Triennial Cycle: The Energy code is updated regularly to keep pace with State legislature's goals and policies.

Energy Code in Design and Construction: The energy code helps to inform our decision making processes.

A Closer Look into Title 24 Part 6: The California energy efficiency standards have been organized by broad building type and energy use categories.

Additional Resources: Where to find tools and information to help you and others learn about the energy code



Historical Context

National Energy Crisis and the Oil Embargo

- Oil Embargo in 1973
 - US dependent on OPEC oil
 - Crisis from limited supply of gas
- The embargo helped to change attitude towards energy
 - Speed limit from 70 to 55 mph to save energy
 - Oregon turned off all hot water to state buildings
 - President Jimmy Carter asked everyone to put on a sweater and install solar panels on the roof of the White House (Ronald Reagan removed them at the start of his term)



Photos: theconversation.com,
<https://history.state.gov/milestones/1969-1976/oil-embargo>

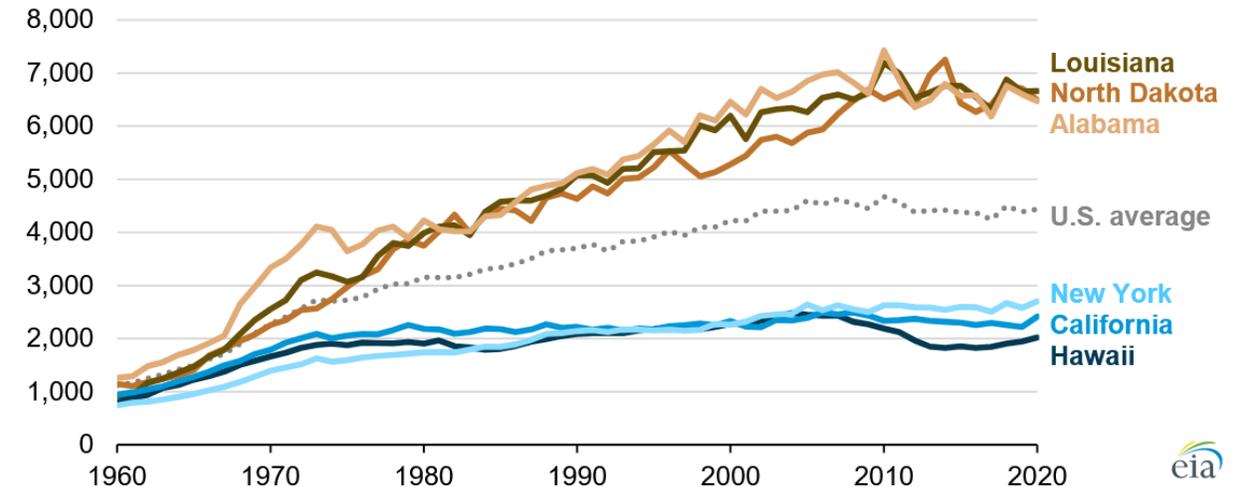
California Adopts Legislation Addressing its Energy Future

- California Energy Commission established 1974
- California Buildings Standards Commission created the CA Energy Code in 1978
 - To reduce CA energy consumption
 - Development of California Energy Efficiency Standards
- California adopts the most stringent energy code in the US
- Energy consumption in California levels off at 1970 energy consumption while the state grows significantly in population.
 - 1978 pop. About 23 million
 - 2020 pop. About 40 million

AUGUST 6, 2021

Per capita U.S. residential electricity use was flat in 2020, but varied by state

Annual residential electricity retail sales per capita, selected states (1960–2020)
kilowatthours (kWh) per person



Source: Graph by the U.S. Energy Information Administration (EIA), based on EIA's [State Energy Data System](#) and [Electricity Data Browser](#) and data from the [U.S. Census Bureau](#)

Energy Efficiency Standards are Born

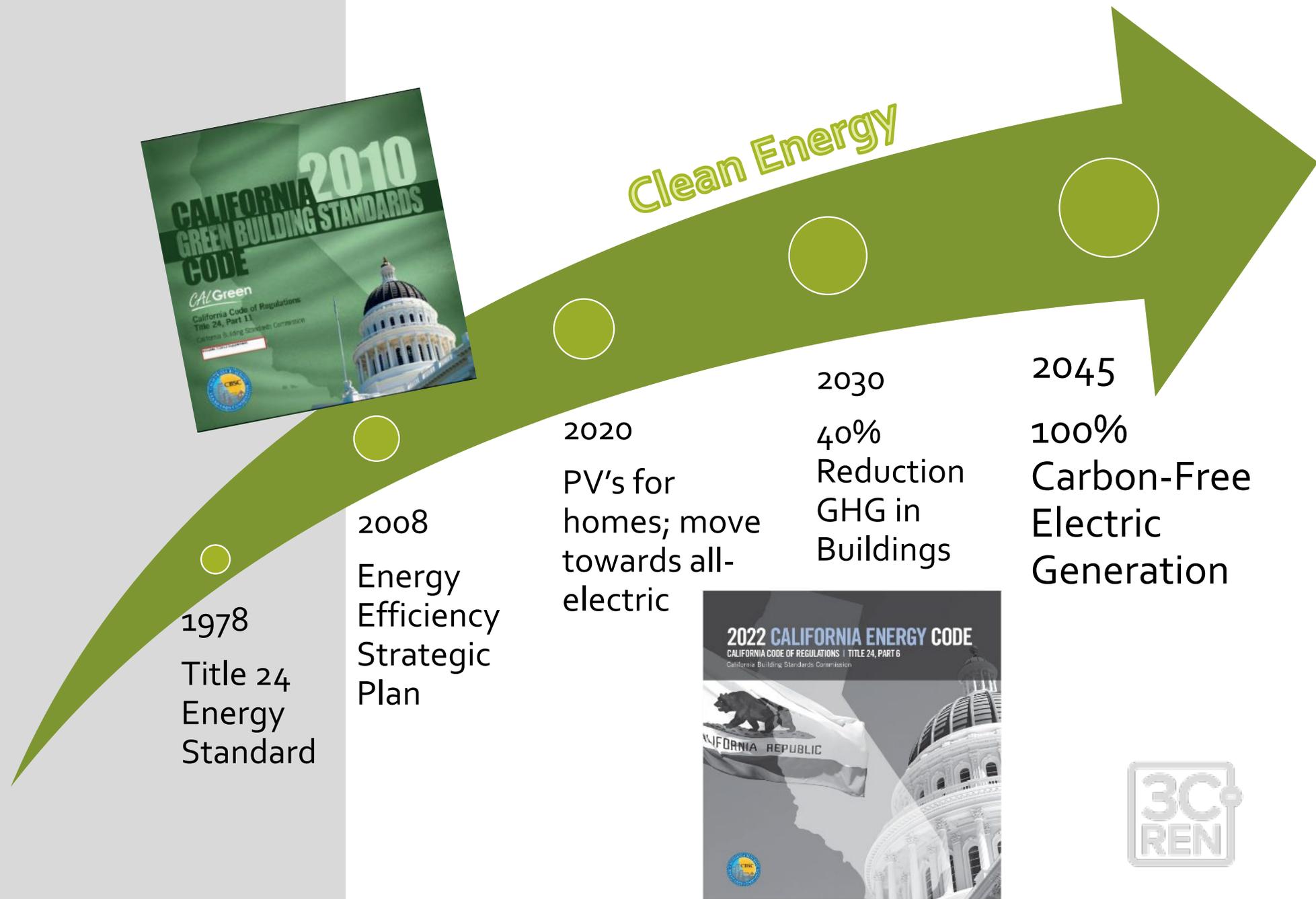
- Building code is a set of standards established and enforced by local government for public health, safety, and welfare related to buildings.
- Energy Code is designed to “reduce wasteful and unnecessary energy consumption” through a set of standards
- Energy code works! California has one of the lowest per capita energy consumption in the US –2nd in the Building Sector, 2021.



Credits: www.cgs.ca.gov, wakelandhdc.com

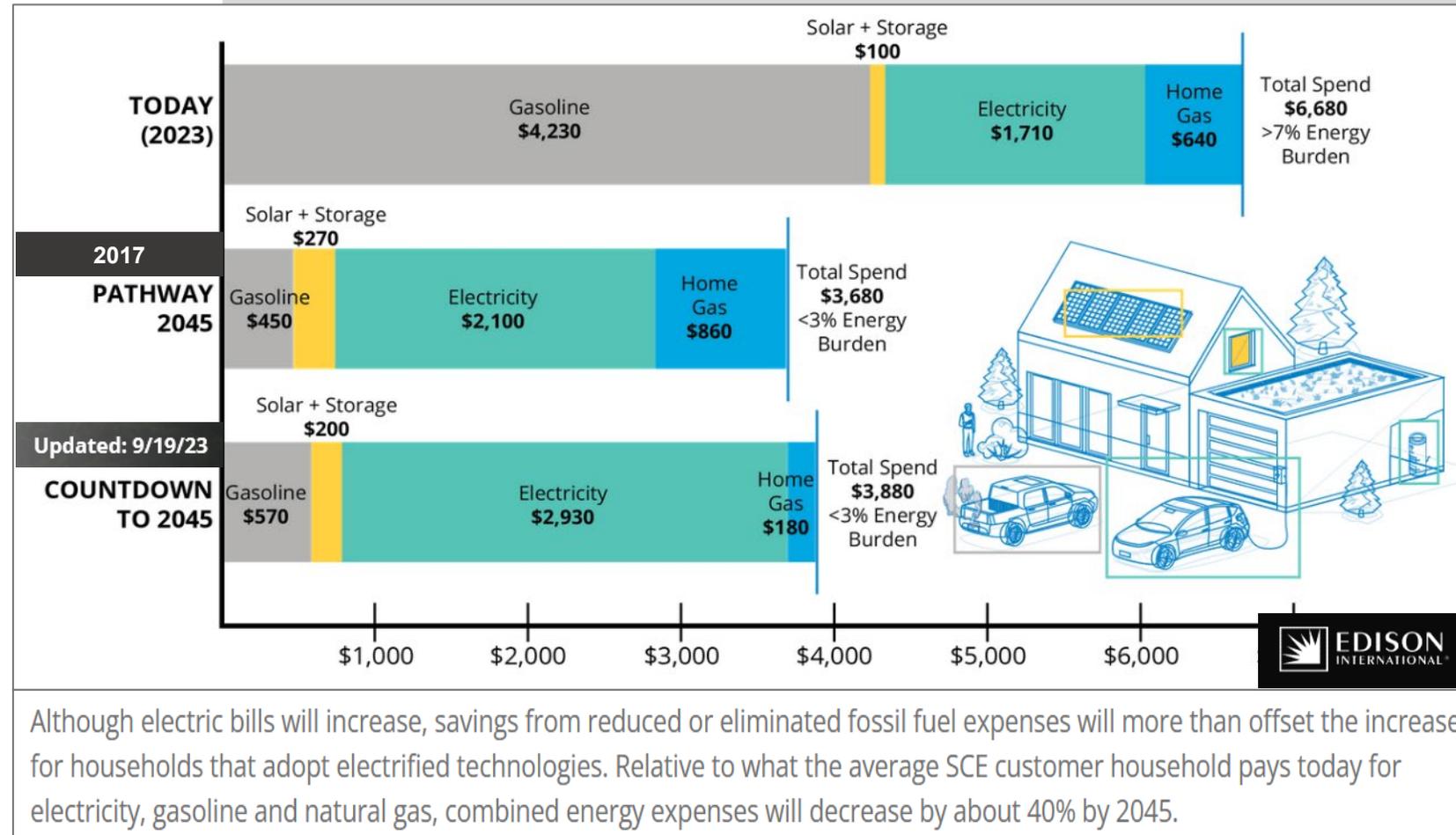
Opened in 2009; LEED Platinum Certification;
Affordable housing awarded for energy conservation
and sustainability.

California on the Path to Greater Building Efficiency and Clean Energy Production



Transitioning to Carbon Free Energy

- The Building Sector is a major consumer of energy in California
- Newer buildings continue to use less gas and more electricity
- Many jurisdictions are implementing a reach code to hasten carbon reduction
- Households are projected to save money after the transition –includes personal transportation costs



www.edison.com/countdownto2045

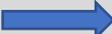


California's Energy Code

California Code of Regulations (CCR)

California has 28 **Titles** comprising the rules and regulations e.g. administrative laws, for roughly 200 regulatory agencies. The Office of Administrative Law (OAL) maintains and oversees all but Title 24 Building Standards Code, which falls under the California Building Standards Commission.

Title 1. General Provisions
Title 2. Administration
Title 3. Food and Agriculture
Title 4. Business Regulations
Title 5. Education
Title 6. Governor's Regulations (empty)
Title 7. Harbors and Navigation
Title 8. Industrial Relations
Title 9. Rehabilitative and Developmental Services
Title 10. Investment
Title 11. Law
Title 12. Military and Veterans Affairs
Title 13. Motor Vehicles
Title 14. Natural Resources

Title 15. Crime Prevention and Corrections
Title 16. Professional and Vocational Regulations
Title 17. Public Health
Title 18. Public Revenues
Title 19. Public Safety
 **Title 20. Public Utilities and Energy**
Title 21. Public Works
Title 22. Social Security
Title 23. Waters
 **Title 24. Building Standards Code**
 **Title 25. Housing and Community Development**
Title 26. Toxics
Title 27. Environmental Protection
Title 28. Managed Health Care

Calif. Code of Regulations and the Building Standards Commission

Through a contract with Westlaw, the CCR Titles can be found on line at <https://govt.westlaw.com/calregs>

govt.westlaw.com/calregs/Browse/Home/California/CaliforniaCodeofRegulations?bhcp=1&tr
DSPS - Cuest... Tools & Guides | Bu... CSI EPBB Calculator ECC Trainings - All... HPWH P

THOMSON REUTERS
WESTLAW California Code of Regulations

California Code of Regulations

- [Title 1. General Provisions](#)
- [Title 2. Administration](#)
- [Title 3. Food and Agriculture](#)
- [Title 4. Business Regulations](#)
- [Title 5. Education](#)
- [Title 7. Harbors and Navigation](#)
- [Title 8. Industrial Relations](#)
- [Title 9. Rehabilitative and Developmental Services](#)
- [Title 10. Investment](#)
- [Title 11. Law](#)
- [Title 12. Military and Veterans Affairs](#)
- [Title 13. Motor Vehicles](#)
- [Title 14. Natural Resources](#)
- [Title 15. Crime Prevention and Corrections](#)
- [Title 16. Professional and Vocational Regulations](#)
- [Title 17. Public Health](#)
- [Title 18. Public Revenues](#)
- [Title 19. Public Safety](#)
- [Title 20. Public Utilities and Energy](#)
- [Title 21. Public Works](#)
- [Title 22. Social Security](#)
- [Title 23. Waters](#)
- [Title 24. Building Standards Code](#)
- [Title 25. Housing and Community Development](#)
- [Title 26. Toxics](#)
- [Title 27. Environmental Protection](#)
- [Title 28. Managed Health Care](#)

Privacy Accessibility California Office of Administrative Law

Codes

Building Standards Commission

For example, how to sell to the state?

GOV HOME NOW CODES CALGREEN RULEMAKING FORMS P-SOURCES NEWS CALENDARS ABOUT CONTACT

2024 Triennial Code Adoption Cycle

To develop and adopt the 2024 edition of Title 24 with new California amendments. Subscribe to our mailing list and visit the Rulemaking page for public participation opportunities.

FEATURED LINKS

- [Title 24 - The California Building Standards Code](#)
Access to Title 24 - Parts 1 - 12, including errata, supplements and emergency supplements.
- [CALGreen](#)
California's first-in-the-nation GREEN building code.
- [Local Amendments to Building Standards - Ordinances](#)
- [EDUCATION & OUTREACH](#)

CALIFORNIA BUILDING STANDARDS CODE

Expand All

- [2022 TRIENNIAL EDITION OF TITLE 24](#)
- [2019 TRIENNIAL EDITION OF TITLE 24](#)
- [2016 TRIENNIAL EDITION OF TITLE 24](#)
- [2013 TRIENNIAL EDITION OF TITLE 24](#)

PURCHASE THE CODES

The California Building Standards Code (Cal. Code Regs., Title 24) is available for purchase from the following publishers or is viewable at no cost through several [State Document Depository Libraries](#).

International Code Council (ICC)
Parts 1, 2, 2.5, 6, 8, 9, 10, 11 and 12
(800) 786-4452

Title 24 Building Standards Codes links to the California Department of General Services: Building Standards Commission

<https://www.dgs.ca.gov/BSC>

Title 24 Building Standards

<https://www.dgs.ca.gov/BSC/Codes>

CALIFORNIA BUILDING STANDARDS CODE

Expand All

2022 TRIENNIAL EDITION OF TITLE 24

The 2022 California Building Standards Code (Cal. Code Regs., Title 24) will be published July 1, 2022, with an effective date of January 1, 2023. [A summary of the code changes in this edition](#) is available under the Resources tab of the CBSC website.

The active links below will take you to each publisher's website. Please contact CBSC at cbsc@dgs.ca.gov if you have difficulty accessing the codes.

PART 1 – CALIFORNIA ADMINISTRATIVE CODE

- [Supplement – Part 1](#) Check history note appendices to determine effective date of each change.

PART 2 – CALIFORNIA BUILDING CODE – Volumes 1 & 2

- [Errata – Part 2, Volume 1 \(non-substantive corrections\)](#) Effective January 1, 2023
- [Supplement – Part 2 Volume 1](#) Effective July 1, 2024
- [Errata – Part 2, Volume 2 \(non-substantive corrections\)](#) Effective January 1, 2023
- [Supplement – Part 2 Volume 2](#) Effective July 1, 2024

PART 2.5 – CALIFORNIA RESIDENTIAL CODE

- [Errata – Part 2.5 \(non-substantive corrections\)](#) Effective January 1, 2023
- [Supplement – Part 2.5](#) Effective January 1, 2024

PART 3 – CALIFORNIA ELECTRICAL CODE

NOTE: NFPA requires creation of a user login to view its free online resources.

PART 4 – CALIFORNIA MECHANICAL CODE

- [Supplement – Part 4](#) Effective July 1, 2024

PART 5 – CALIFORNIA PLUMBING CODE

- [Errata – Part 5 \(non-substantive corrections\)](#) Effective January 1, 2023
- [Supplement – Part 5](#) Effective July 1, 2024

Title 24, Part 6 California Energy Code <https://codes.iccsafe.org/content/CAEC2022P2>

Menu ICC DIGITAL CODES® Search across 2022 California Energy Code, Title 24, Part 6 with Jan 2023 Errata

All Codes » California Legend Information

SECTIONS	NOTES
2022 CALIFORNIA ENERGY CODE, TITLE 24, PART 6 WITH JAN 2023 ERRATA	
COPYRIGHT	
PREFACE	
ACKNOWLEDGMENTS	
CALIFORNIA CODE OF REGULATIONS, TITLE 24	
HOW TO DETERMINE WHERE CHANGES HAVE BEEN MADE	

2022 CALIFORNIA ENERGY CODE, Title 24, Part 6 with Jan 2023 Errata **BASIC**

♥ Add to Favorites

The California Energy Code (CEC) contains energy conservation standards applicable to most residential and nonresidential buildings throughout California, including schools.

Included is a free subscription service for all state updates and supplements. Effective Date: January 1, 2023.

PART 6 – CALIFORNIA ENERGY CODE

- [Errata – Part 6 \(non-substantive corrections\)](#) Effective January 1, 2023
- [Supplement – Part 6](#) Effective July 1, 2024

PART 7 – Vacant - formerly California Elevator Safety Construction Code (see Cal. Code Regs., Title 8)

PART 8* – CALIFORNIA HISTORICAL BUILDING CODE

PART 9 – CALIFORNIA FIRE CODE

- [Errata – Part 9 \(non-substantive corrections\)](#) Effective January 1, 2023
- [Supplement – Part 9](#) Effective July 1, 2024

PART 10* – CALIFORNIA EXISTING BUILDING CODE

- [Supplement – Part 10](#) Effective July 1, 2024

PART 11 – CALIFORNIA GREEN BUILDING STANDARDS CODE also referred to as **CALGreen**

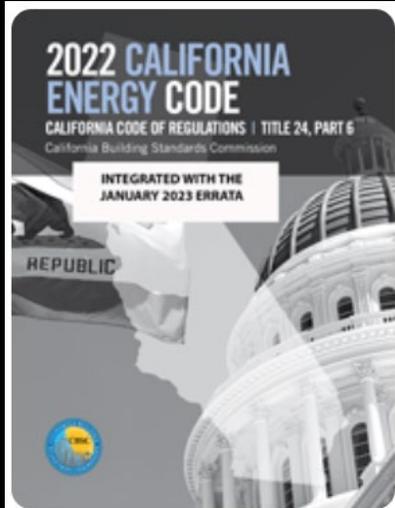
- [Errata – Part 11 \(non-substantive corrections\)](#) Effective January 1, 2023
- [Supplement – Part 11](#) Effective July 1, 2024

PART 12* – CALIFORNIA REFERENCED STANDARDS CODE

*The printed versions of Parts 8, 10, and 12 are located in a shared binder featuring Part 10.

Title 24 Part 6, CCR / ICC

Digital Version – Basic and Premium



2022 California Energy Code, Title 24, Part 6 with Jan 2023 Errata

▶ SUBCHAPTER 1 ALL OCCUPANCIES—
GENERAL PROVISIONS

▶ SUBCHAPTER 2 ALL OCCUPANCIES—
MANDATORY REQUIREMENTS FOR THE
MANUFACTURE, CONSTRUCTION AND
INSTALLATION OF SYSTEMS, EQUIPMENT
AND BUILDING COMPONENTS

▶ SUBCHAPTER 3 NONRESIDENTIAL,
HOTEL/MOTEL OCCUPANCIES, AND
COVERED PROCESSES—MANDATORY
REQUIREMENTS

▶ SUBCHAPTER 4 NONRESIDENTIAL AND
HOTEL/MOTEL OCCUPANCIES—
MANDATORY REQUIREMENTS FOR LIGHTING
SYSTEMS AND EQUIPMENT, AND
ELECTRICAL POWER DISTRIBUTION
SYSTEMS

▶ SUBCHAPTER 5 NONRESIDENTIAL AND
HOTEL/MOTEL OCCUPANCIES—
PERFORMANCE AND PRESCRIPTIVE
COMPLIANCE APPROACHES FOR ACHIEVING
ENERGY EFFICIENCY

▶ SUBCHAPTER 6 NONRESIDENTIAL AND
HOTEL/MOTEL OCCUPANCIES— ADDITIONS,
ALTERATIONS AND REPAIRS

▶ SUBCHAPTER 7 SINGLE-FAMILY
RESIDENTIAL BUILDINGS— MANDATORY
FEATURES AND DEVICES

▶ SUBCHAPTER 8 SINGLE-FAMILY
RESIDENTIAL BUILDINGS—PERFORMANCE
AND PRESCRIPTIVE COMPLIANCE
APPROACHES

▶ SUBCHAPTER 9 SINGLE-FAMILY
RESIDENTIAL BUILDINGS—ADDITIONS AND
ALTERATIONS TO EXISTING RESIDENTIAL
BUILDINGS

▶ SUBCHAPTER 10 MULTIFAMILY BUILDINGS—
MANDATORY REQUIREMENTS

▶ SUBCHAPTER 11 MULTIFAMILY BUILDINGS—
PERFORMANCE AND PRESCRIPTIVE
COMPLIANCE APPROACHES

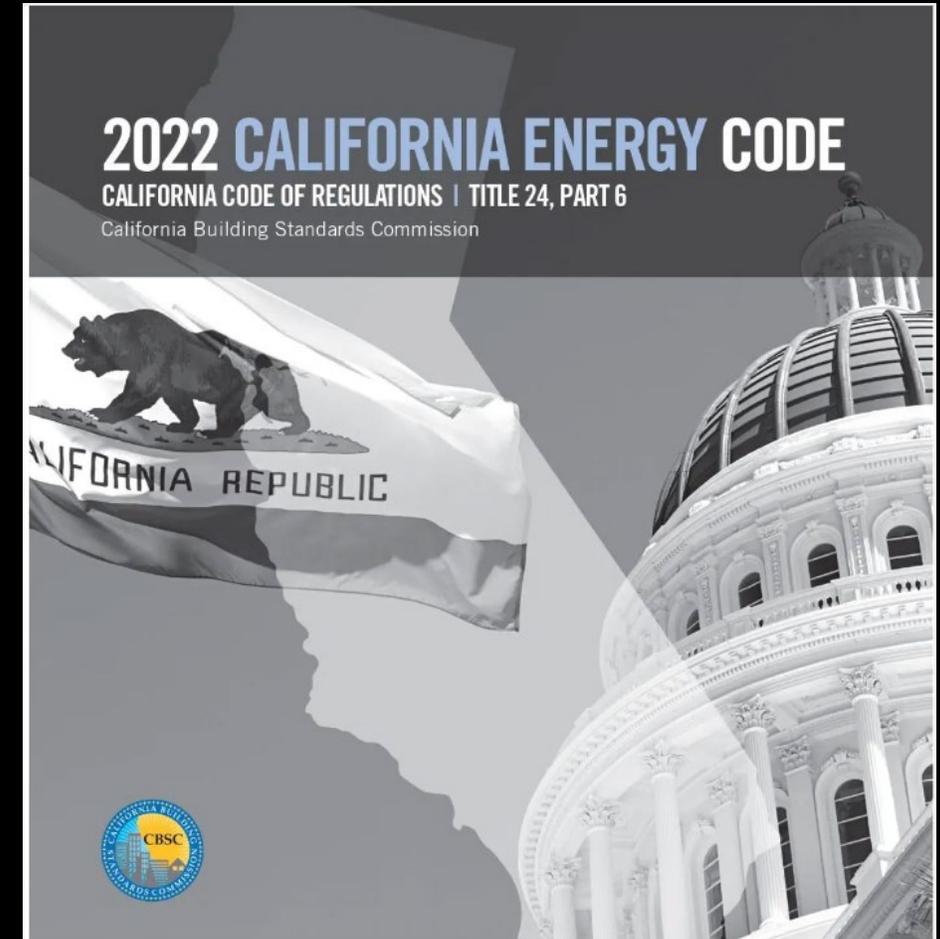
▶ SUBCHAPTER 12 MULTIFAMILY BUILDINGS—
ADDITIONS, ALTERATIONS AND REPAIRS TO
EXISTING MULTIFAMILY BUILDINGS

APPENDIX 1-A STANDARDS AND
DOCUMENTS REFERENCED IN THE ENERGY
CODE

APPENDIX 1-B ENERGY COMMISSION
DOCUMENTS INCORPORATED BY
REFERENCE IN THEIR ENTIRETY

HISTORY NOTE APPENDIX

Print Version – PDF or Loose





Energy Code Triennial Cycle



California Energy Commission (CEC)

energy.ca.gov

Our Responsibilities

- Advancing State Energy Policy
- Achieving Energy Efficiency
- Investing in Energy Innovation
- Developing Renewable Energy
- Transforming Transportation
- Overseeing Energy Infrastructure
- Preparing for Energy Emergencies

[EXPLORE OUR CORE RESPONSIBILITIES >](#)



PUBLIC RECORDS ACT REQUESTS. Use the [online form](#) to submit a Public Records Act Request.

ABOUT

The California Energy Commission is leading the state to a 100 percent clean energy future for all. As the state's primary energy policy and planning agency, the Energy Commission is committed to reducing energy costs and environmental impacts of energy use while ensuring a safe, resilient, and reliable supply of energy.

[About the Energy Commission](#)
[CEC's 45th Anniversary Events](#)

DIVISIONS

- Efficiency
- Energy Assessments
- Energy Research and Development
- Fuels and Transportation
- Reliability, Renewable Energy & Decarbonization Incentives
- Siting, Transmission, and Environmental Protection

LEADERSHIP



Gavin Newsom
California Governor



Wade Crowfoot
Secretary for Natural Resources



David Hochschild
Chair, California Energy Commission

NEWS



CEC Awards \$30 Million to 100-Hour, Long-Duration Energy Storage Project

December 13, 2023

CEC Celebrates Winners of the 2023 Clean Energy Hall of Fame Awards

December 08, 2023

California Joins Global Offshore Wind Alliance in Ambitious Commitment

December 05, 2023

CEC to Honor Winners of the 2023 Clean Energy Hall of Fame Awards

November 29, 2023

CEC Holds Workshops on Implementing Senate Bill X1-2: the California Gas Price Gouging and Transparency Law

November 01, 2023

[More News >](#)

EVENTS



JAN 10 Pre-Application Workshop - GFO-23-606 - Charging Infrastructure for Government Fleets

January 10, 2024 | 10:00 AM - 12:00 PM
Remote Access Only

JAN 15 State Holiday - Martin Luther King Jr. Day

January 15, 2024 | 08:00 AM - 05:00 PM
California Energy Commission

JAN 17 Commissioner Workshop on Load Management Standards Implementation

January 17, 2024 | 09:00 AM - 01:00 PM
Remote Access Only

JAN 17 Staff Webinar on Senate Bill X1-2 Implementation - Revised CEC Spot Contract Forms

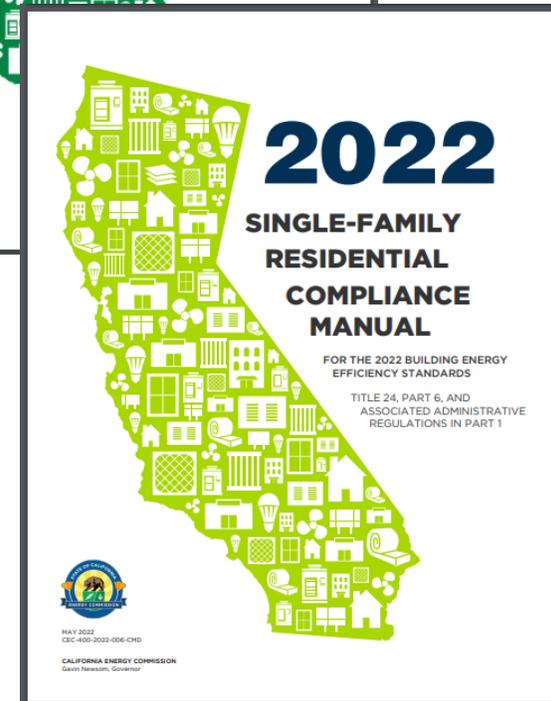
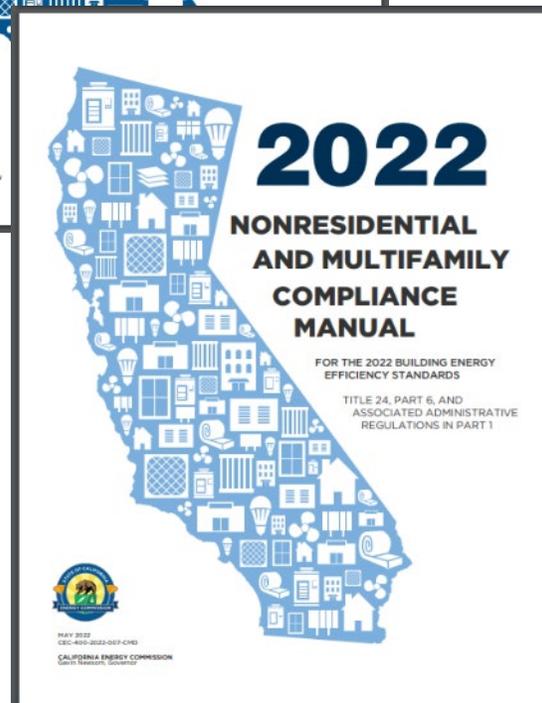
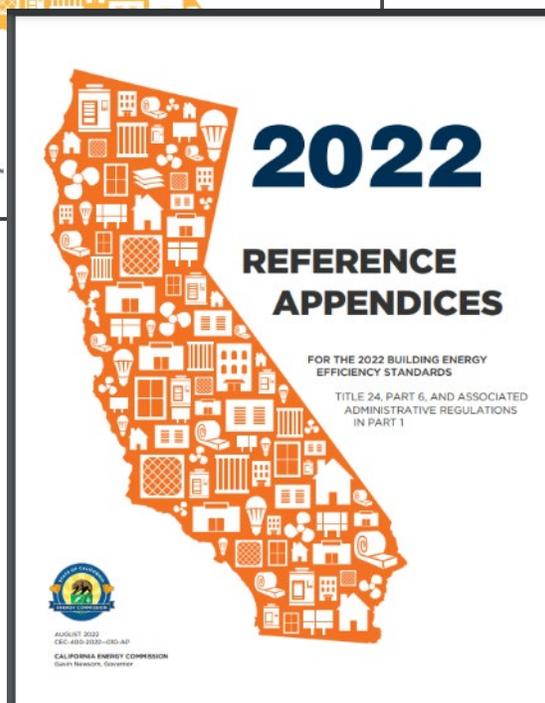
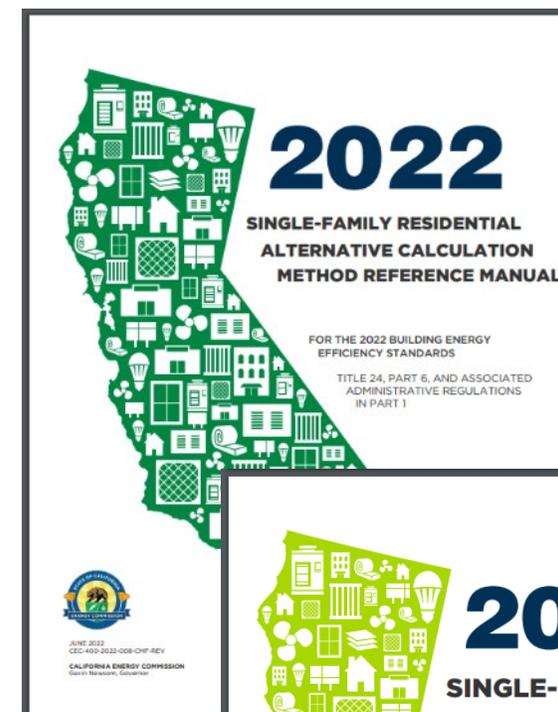
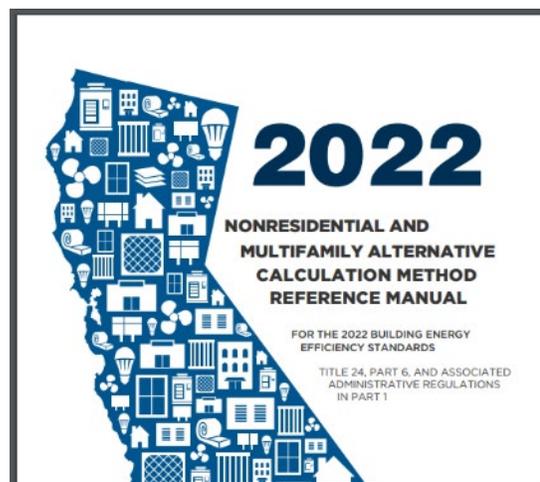
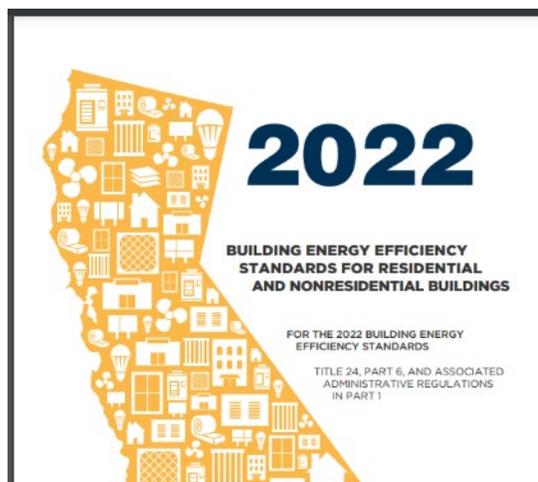
January 17, 2024 | 09:00 AM - 10:00 AM
Remote Access Only

[More Events >](#)

Energy Standards – Adoption Timeline



Title 24 Part 6, 2022 Standards and Manuals

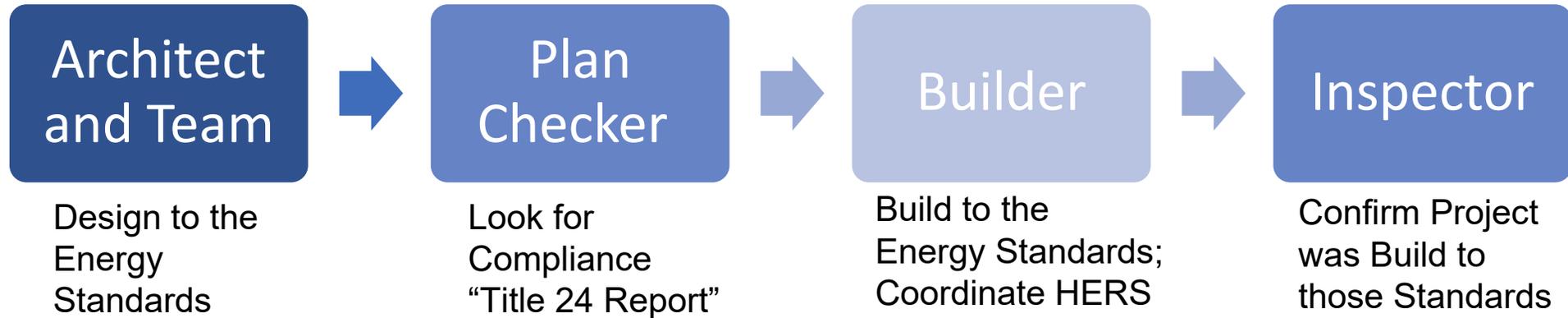




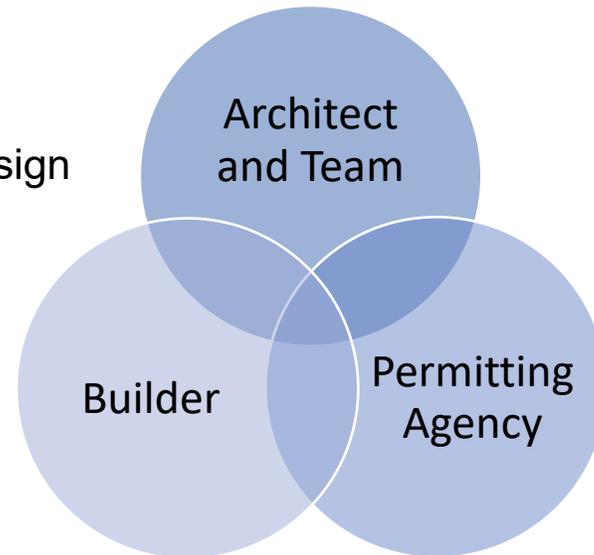
The Energy Code in a Design and Construction Process

Plan and Design for Energy Code Compliance

Linear Approach to Design



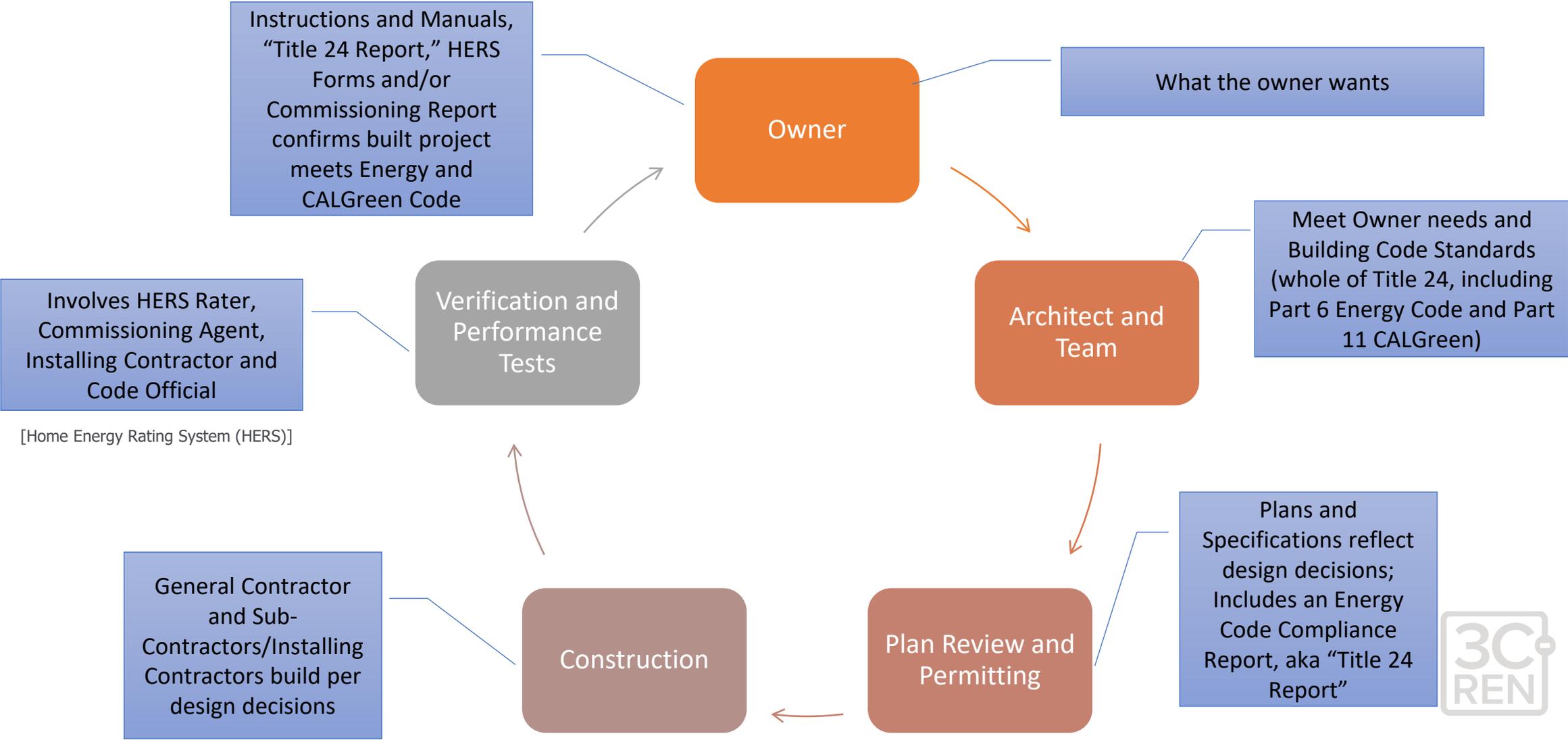
Integrated Approach to Design



Integrated approach identifies issues early and enables efficiencies



Design and Construction – When do the Energy Code (and Green Code) come into play?





Closer Look into Title 24 Part 6

The Energy Code –Three Compliance Terms

Mandatory Requirements

Energy efficiency measures that are applicable to all projects.

Prescriptive Component Package

Mandatory Requirements are applicable

Follow all the parts of the prescriptive package

Note: used to determine the Standard Design Building

Essentially a **checklist** approach

Performance Method

Mandatory Requirements are applicable

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)

Energy modeling approach

Energy Code is based on Climate Zones (CZ) and Typical Meteorological Year Data (TMY)

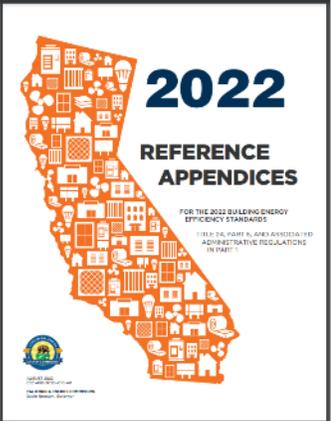
The California Energy Commission has an on-line tool:
EZ Building Climate Zone Finder



<https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/climate-zone-tool-maps-and>

Example of CZ 5

16 Climate Zones (CZ) in California



2022 Joint Appendices Appendix JA2-1

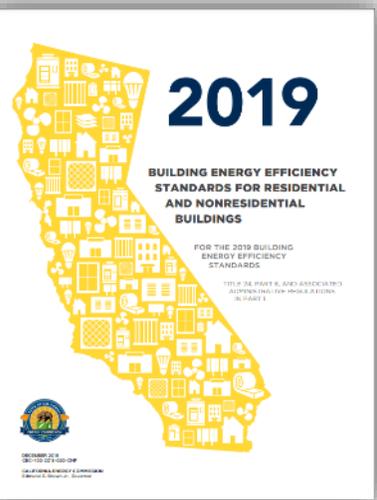
Joint Appendix JA2

Appendix JA2 – Reference Weather/Climate Data

Figure 2-1 – Climate Zone Map

Appendix JA2 – Reference Weather/Climate Data

T24 Part 6 Energy Code – Subchapter Organization



All [*regulated*] Occupancies
(A, B, E, F, H, I M, R, S, or U, except I-3 and I-4)

Subchapter 1 –All Occupancy –Scope, Definition
Subchapter 2 –All Occupancies – Mandatory Requirements

Sec 100.0-100.3
&
Sec 110.0-110.12

Not Low-Rise Res

Low-Rise Res

Subchapter 3 –Nonresidential, High-Rise Res, Hotel/Motel, Covered Process –Mandatory Requirements
[HVAC and Ventilation]

Sec 120.0-120.9

Subchapter 4 –Nonresidential, High-Rise Res, Hotel/Motel – Mandatory Requirements
[Lighting and Power]

Sec 130.0-130.5

Subchapter 5 –Performance and Prescriptive
[New Construction]

Sec 140.0-140.9

Subchapter 6 – Additions and Alterations

Sec 141.0-141.1

Subchapter 7 –Low-Rise Residential Mandatory Measures

Sec 150.0

Subchapter 8 – Performance and Prescriptive
[New Construction]

Sec 150.1

Subchapter 9 – Additions and Alterations

Sec 150.2

T24 Part 6 Energy Code – Subchapter Organization



All [regulated] Occupancies
 (A, B, E, F, H, I M, R, S, or U, except I-3 and I-4)

Subchapter 1 –All Occupancy –Scope, Definitions
Subchapter 2 –All Occupancies – Mandatory Requirements

Sec 100.0-100.3
 &
 Sec 110.0-110.12

Not Residential

Subchapter 3 – Nonresidential, Hotel/Motel, Covered Process –Mandatory Requirements
 [HVAC and Ventilation]
 Sec 120.0-120.9

Subchapter 4 – Nonresidential, Hotel/Motel –Mandatory Requirements
 [Lighting and Power]
 Sec 130.0-130.5

Subchapter 5 –Performance and Prescriptive
 [New Construction]
 Sec 140.0-140.9

Subchapter 6 – Additions and Alterations
 Sec 141.0-141.1

Single Family Res

Subchapter 7 –Single Family Residential Mandatory Measures
 Sec 150.0

Subchapter 8 – Performance and Prescriptive
 [New Construction]
 Sec 150.1

Subchapter 9 – Additions and Alterations
 Sec 150.2

Multifamily Res

Subchapter 10 – Multifamily Residential Mandatory Measures
 Sec 160.0-160.9

Subchapter 11 – Performance and Prescriptive
 [New Construction]
 Sec 170.0-170.2

Subchapter 12 – Additions and Alterations
 Sec 180.0-180.4

Subchapter 1 –Application of the Standards



Subchapter 1 Table 100.0-A

Useful way of looking at how the Energy Code Sections apply to particular applications

TABLE 100.0-A— APPLICATION OF STANDARDS

OCCUPANCIES	APPLICATION	MANDATORY	PRESCRIPTIVE	PERFORMANCE	ADDITIONS/ ALTERATIONS
All Buildings	General	100.0 , 100.1 , 100.2 , 110.0	100.0 , 100.1 , 100.2 , 110.0	100.0 , 100.1 , 100.2 , 110.0	100.0 , 100.1 , 100.2 , 110.0
Nonresidential and Hotels/Motels	General	120.0	140.0 , 140.2	140.0 , 140.1	141.0
	Envelope (conditioned)	110.6 , 110.7 , 110.8 , 120.7	140.3		
	Envelope (unconditioned, process spaces)	N.A.	140.3(c)		
	HVAC (conditioned)	110.2 , 110.5 , 120.1 , 120.2 , 120.3 , 120.4 , 120.5 , 120.8	140.4		
	Water Heating	110.3 , 120.3 , 120.8 , 120.9	140.5	N.A.	
	Indoor Lighting (conditioned, process spaces)	110.9 , 120.8 , 130.0 , 130.1 , 130.4	140.3(c) , 140.6		
	Indoor Lighting (unconditioned and parking garages)	110.9 , 120.8 , 130.0 , 130.1 , 130.4	140.3(c) , 140.6		
	Outdoor Lighting	110.9 , 130.0 , 130.2 , 130.4	140.7		
	Electrical Power Distribution	110.11 , 130.5	N.A.		
	Pool and Spa Systems	110.4 , 110.5 , 150.0(p)			
	Solar Ready Buildings	110.10	N.A.	140.0 , 140.1	
Solar PV and Battery Storage Systems	N.A.				
Covered Processes ¹	Envelope, Ventilation, Process Loads	110.2 , 120.6	140.9	140.1	120.6 , 140.9 , 141.1
Signs	Indoor and Outdoor	110.9 , 130.0 , 130.3	140.8	N.A.	141.0 , 141.0(b)2H

Subchapter 1 –Application of the Standards



Example:

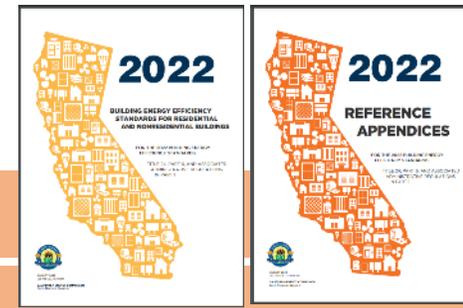
- Single-family,
- Envelope (walls, floor, roof, windows, etc),
- Mandatory Measures, and
- Prescriptive Requirements

TABLE 100.0-A— APPLICATION OF STANDARDS

OCCUPANCIES	APPLICATION	MANDATORY	PRESCRIPTIVE	PERFORMANCE	ADDITIONS/ ALTERATIONS
Single-family	General	150.0			
	Envelope (conditioned)	110.6, 110.7, 110.8, 150.0(a), 150.0(b), 150.0(c), 150.0(d), 150.0(e), 150.0(g), 150.0(q)			
	HVAC (conditioned)	110.2, 110.5, 150.0(h), 150.0(i), 150.0(j), 150.0(m), 150.0(o)	150.1(a)-(c)	150.1(a)-(b)	150.2(a)-(b)
	Water Heating	110.3, 150.0(j), (n)			
	Indoor Lighting (conditioned, unconditioned and parking garages)	110.9, 130.0, 150.0(k)			
	Outdoor Lighting	110.9, 130.0, 150.0(k)			
	Pool and Spa Systems	110.4, 150.0(p)	N.A.	N.A.	
	Solar Ready Buildings	110.10	N.A.	N.A.	N.A.
	Electric Ready	150.0(s), 150.0(t), 150.0(u), 150.0(v)	N.A.	N.A.	N.A.
	Solar PV Systems	N.A.	150.0(c)14	150.1(a)-(b)	N.A.
Multifamily	General	160.0	170.2		
	HVAC (conditioned)	110.6, 110.7, 110.8, 160.1	170.1(a)		
	Ventilation and Indoor Air Quality	160.2	N.A.		
	HVAC (conditioned)	110.2, 110.5, 160.3	170.2(c)	170.1	
	Water Heating	110.3, 160.4	170.2(d)		
	Indoor Lighting	110.9, 160.5	170.2(e)		
	Outdoor Lighting	110.9, 160.5	170.2(e)		
	Electrical Power Distribution	110.11, 160.6			
	Pool and Spa Systems	110.4, 110.5, 160.7			
	Solar Ready Buildings	110.10, 160.8	N.A.	N.A.	
	Electric Ready	160.9			N.A.
Solar PV and Battery Storage Systems	N.A.	170.2(f), (g), (h)	170.1	N.A.	

1. Nonresidential and hotel/motel buildings that contain covered processes may conform to the applicable requirements of both occupancy types listed in this table.
 Note: Authority: Sections 25213, 25218, 25218.5, 25402 and 25402.1, Public Resources Code. Reference: Sections 25007, 25008, 25218.5, 25310, 25402, 25402.1, 25402.4, 25402.5, 25402.8 and 25943, Public Resources Code.

Low Rise Residential – Prescriptive Example



Single Family (Townhomes and Duplexes)

Subchapter 7

150.0 Mandatory Measures

Applies to all :

- (a) Ceiling and Roof Insulation
- (b) Loose-fill Insulation
- (c) Wall Insulation**
- (d) Raised-floor Insulation
- (e) Fireplaces
- (f) Slab Edge Insulation
- (g) Vapor Retarder
- (h) Space Conditioning Equip
- (i) Thermostats
- (j) Insulation for Piping and Tanks
- (k) Residential Lighting
- (l) *not used*
- (m) Air Distribution...System...Fans
- (n) Water Heating System
- (o) Ventilation and Indoor Air Quality
- (p) Pool Equip
- (q) Fenestration [windows/skylights]
- (r) Solar Ready Buildings

Subchapter 8

150.1 Performance and Prescriptive [*New Construction*]

Climate Zone dependent

Applies to

- Hot water heating System
- Mechanical space conditioning system
- Indoor Air Quality Ventilation
- Building Envelope**

Show Compliance

- Prescriptive (akin to following a checklist) or**
- Performance Method, i.e. detailed computer modeling analysis

Subchapter 9

150.2 Additions and Alterations

Climate Zone dependent

Applies to

- Hot water heating System
- Mechanical space conditioning system
- Indoor Air Quality Ventilation
- Building Envelope

Show Compliance

- Prescriptive (akin to following a checklist) or
- Performance Method, i.e. detailed computer modeling analysis

Prescriptive Wall Example

Example 1: Single-family New Construction, Thousand Oaks area (CZ9), wood framed walls



TABLE 150.1-A COMPONENT PACKAGE—SINGLE-FAMILY STANDARD BUILDING DESIGN



SINGLE FAMILY				CLIMATE ZONE																	
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
Building Envelope Insulation																					
Building Envelope	Roofs/Ceilings	Option B (meets §150.1(c)9A)	Below Roof Deck Insulation ^{1,2} (With Air Space)	NR	NR	NR	R-19	NR	NR	NR	R-19										
			Ceiling Insulation	R-38	R-38	R-30	R-38	R-30	R-30	R-30	R-30	R-38									
			Radiant Barrier	NR	REQ	REQ	NR	REQ	REQ	REQ	NR										
		Option C (meets §150.1(c)9B)	Ceiling Insulation	R-38	R-30	R-38															
			Radiant Barrier	NR	REQ	NR															
	Walls	Above Grade	Framed 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										
			Mass Wall Interior ^{4,5}	U 0.077 R-13	U 0.059 R-17																
			Mass Wall Exterior ^{4,5}	U 0.125 R-8.0	U 0.077 R-13																
			Below Grade Interior ⁶	U 0.077 R-13	U 0.067 R-15																
Below Grade Exterior ⁶			U 0.200 R-5.0	U 0.200 R-5.0	U 0.200 R-5.0	U 0.200 R-5.0	U 0.200 R-5.0	U 0.200 R-5.0	U 0.200 R-5.0	U 0.200 R-5.0	U 0.200 R-5.0	U 0.200 R-5.0	U 0.200 R-5.0	U 0.200 R-5.0	U 0.200 R-5.0	U 0.200 R-5.0	U 0.200 R-5.0	U 0.100 R-10	U 0.100 R-10	U 0.053 R-19	
		Slab Perimeter	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	U 0.58 R-7.0		



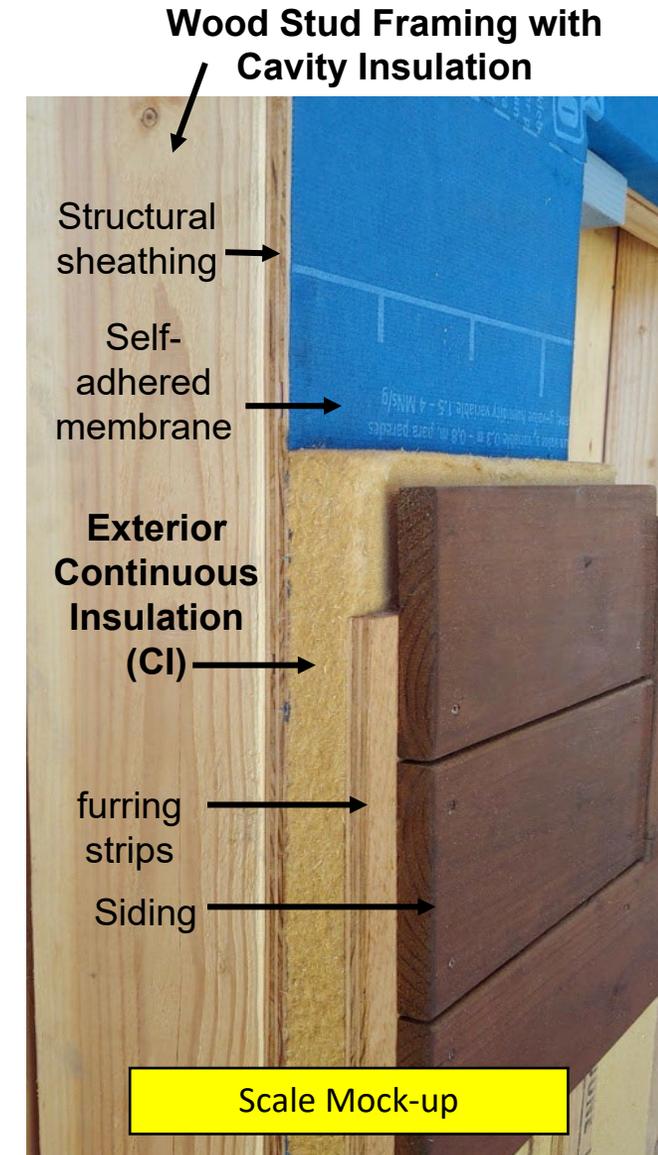
Translation...Walls Assemblies Meeting Prescriptive U-0.065 and U-0.048



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
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
2x6	R19	Low density batt	R6	0.048
2x6	R23	High density bat or mineral wool	R5	0.047

CZ 9



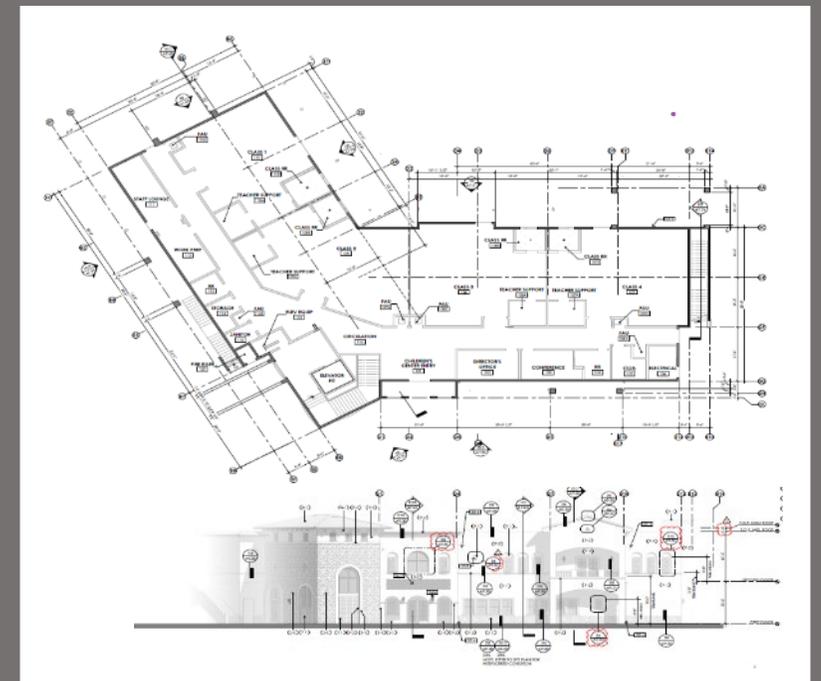
Prescriptive Nonresidential Example



Climate Zone (CZ) 5				Translation -Ref Joint Appendices	
Opaque Envelope	Roofs/Ceilings	Wood Framed (U-factor)	0.034	2x12 Rafter w/ R-30	
	Walls	Wood Framed (U-factor)	0.102	2x4 Stud w/ R-13	
		Metal Framed (U-factors)	0.055	24" o.c. 2x6 mtl stud R-19 + R-12 CI	
	Floors/Soffits	Wood Framed (U-factor)	0.071	2x6 Joist w/ R-11	
Roofing Products	Low-sloped	Aged Solar Reflectance	0.63	Table 140.3 Insulation Trade-off	
		Thermal Emittance	0.75		
Fenestration Products	Vertical	Windows Fixed	0.36	Thermally-Broken Dual-Glazed Typ	
		Windows Operable	0.46		
		WWR	40%		

CZ 4, 9, or 16				Translation -Ref Joint Appendices	
Opaque Envelope	Walls	Wood Framed (U-factor)	0.059	2x6 Stud w/ R-21 + R-2 CI	

CZ 6 or 7				Translation -Ref Joint Appendices	
Opaque Envelope	Walls	Wood Framed (U-factor)	0.110	2x4 Stud w/ R-11	

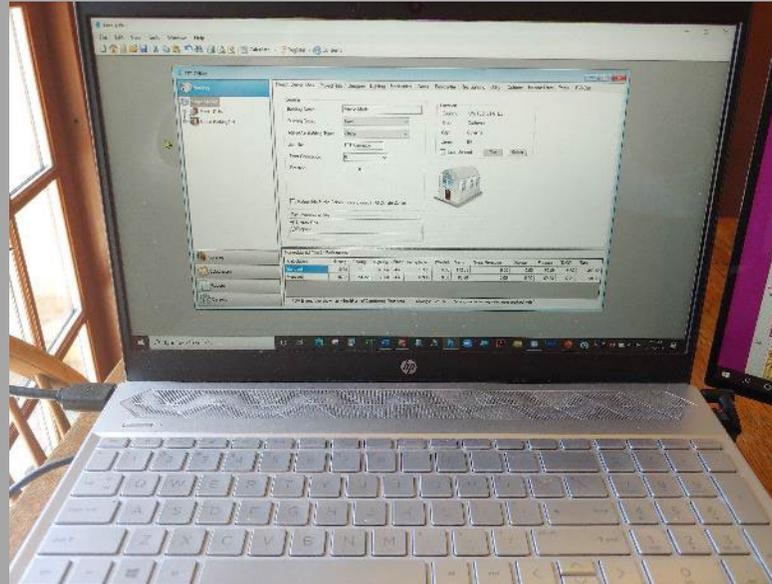


Envelope Example : Two story commercial building Santa Maria area (CZ5)

Walls: Design team is considering **metal** stud walls, but might use **wood** stud walls... What is the implication of this decision?

Side Note: Notice the difference location or a **climate zone (CZ)** could make for a wood stud wall assembly

Performance Method Results



TDV --Time Dependent Valuation represents the annual energy used in the building plus the additional amount of energy that went into delivering energy to the building. Based on a typical meteorologically year, expressed as “energy” (kbtu) use per square foot of building floor area.

Small Office Building Example in CBECC-Com 2022

Overall Result³: **COMPLIES**

	Time Dependent Valuation:		Source Energy use:
	Efficiency ¹ (kBTu/ft ² -yr)	Total ² (kBTu/ft ² -yr)	Total ² (kBTu/ft ² -yr)
Standard Design	134.03	12.73	6.13
Proposed Design	131.10	1.06	5.66
Compliance Margins	2.93	11.67	0.47
	Pass	Pass	Pass

¹ Efficiency measures include improvements like a better building envelope and more efficient equipment

² Compliance Totals include efficiency, photovoltaics and batteries

³ Building complies when all efficiency and total compliance margins are greater than or equal to zero and unmet load hour limits are not exceeded

Standard Design PV Capacity: 167.9 kWdc / Battery System Capacity: 296.8 kWh (power 70.50 kW)

Source Energy represents the annual impact on carbon emissions for the creation and delivery of the energy used. This value is also expressed as kbtu per square foot of building floor area as a proxy for carbon.

Performance Method “Trade-offs” –TDV

“Regulated Loads”
Can be
traded-off
with each
other.

Minimum PV
and Battery
Requirement

End Use	Standard Design TDV (kBtu/ft ² -yr)	Proposed Design TDV (kBtu/ft ² -yr)	Compliance TDV Margin (kBtu/ft ² -yr)	
Space Heating	16.35	16.50	-0.15	← -
Space Cooling	59.32	58.49	0.83	} +
Indoor Fans	16.50	14.26	2.24	
Heat Rejection	--	--	--	
Pumps & Misc.	0.12	0.12	--	
Domestic Hot Water	6.89	6.88	0.01	← +
Indoor Lighting	34.85	34.85	--	
Efficiency Compliance	134.03	131.10	2.93	2.2 %
Photovoltaics	-109.03	-116.92	7.89	} +
Battery	-12.27	-13.12	0.85	
Total Compliance	12.73	1.06	11.67	91.7 %
Receptacle	108.58	108.58	--	
Process	--	--	--	
Other Ltg	--	--	--	
Process Motors	--	--	--	
TOTAL	121.31	109.64	11.67	9.6 %

Performance Method “Trade-offs” –Source

“Regulated Loads”
Can be traded-off with each other.

Minimum PV and Battery Requirement

End Use	Standard Source Energy (kBtu/ft ² -yr)	Proposed Source Energy (kBtu/ft ² -yr)	Compliance Src Margin (kBtu/ft ² -yr)	
Space Heating	5.53	5.58	-0.05	← -
Space Cooling	2.40	2.38	0.02	} +
Indoor Fans	1.08	1.07	0.01	
Heat Rejection	--	--	--	
Pumps & Misc.	0.02	0.02	--	
Domestic Hot Water	0.54	0.54	--	
Indoor Lighting	2.65	2.65	--	
Efficiency Compliance	12.22	12.24	-0.02	-0.2 %
Photovoltaics	-3.92	-4.21	0.29	} +
Battery	-2.17	-2.37	0.20	
Total Compliance	6.13	5.66	0.47	7.7 %
Receptacle	7.72	7.72	--	
Process	--	--	--	
Other Ltg	--	--	--	
Process Motors	--	--	--	
TOTAL	13.85	13.38	0.47	3.4 %



Additional Resources



California Energy Commission Energy.ca.gov

The Online Resource Center provides educational assistance about the Building Energy Efficiency Standards (Energy Code) to building and enforcement communities. The California Energy Commission (CEC) and utilities developed the resources, which include fact sheets, energy videos, and presentations.

BUILDING ENERGY EFFICIENCY STANDARDS - TITLE 24
2025 Building Energy Efficiency Standards
2022 Building Energy Efficiency Standards

Forms, Trainings, Videos

Title 24 Part 6, 2022 Standards and Manuals

- 2022 SINGLE-FAMILY RESIDENTIAL AND MULTIFAMILY ALTERNATIVE CALCULATION METHODS REFERENCE MANUAL
- 2022 NONRESIDENTIAL AND MULTIFAMILY COMPLIANCE MANUAL
- 2022 SINGLE-FAMILY RESIDENTIAL COMPLIANCE MANUAL
- 2022 REFERENCE APPENDICES

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.

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
California Utility Allowance Calculator (CUAC)
Past Building Energy Efficiency Standards
Climate Zone tool, maps, and information supporting the California Energy Code
Online Resource Center
Solar Assessment Tools



Climate Zone Finder

Regulatory Advisory: Low-Rise Multifamily Compliance Forms for the 2022 Energy Code

The 2022 Building Energy Efficiency Standards (Energy Code), which goes into effect January 1, 2023, introduced new requirements for low-rise multifamily (LRMF) buildings and includes the registration of new LRMF compliance documentation.

The two companies certified as residential data registries are creating systems to process and register the new required LRMF compliance documents. Development is ongoing but will not be ready when the 2022 Energy Code goes into effect. As a result, for LRMF buildings only, there will be no approved data registry capable of registering compliance documentation for this building type until a later date.

The California Energy Commission staff recommends local authorities having jurisdiction (AHJs) take several steps to ensure that permitting for LRMF buildings under the 2022 Energy Code is not delayed. Read the full [Regulatory Advisory](#) issued November 18, 2022, published in the [2022 Energy Code Compliance Manuals and Forms docket](#) (21-BSTD-04). Check back here or in the docket for possible updates or more information.



CalCERTS

www.calcerts.com

The screenshot shows the CalCERTS website homepage. At the top left is the CalCERTS logo with the text "CalCERTS, Inc. HERS PROVIDER". To the right is a "Welcome to CalCERTS!" message. Below this is a navigation menu with links: HOME, SECURE HOME, ABOUT, TRAINING, TRAINING CENTER, FIND A RATER, RESOURCES, and CONTACT US. The main content area features a large banner for "EPA 608 Certification Training and Testing" with a background image of a man at a computer. Below the banner are three columns of quick links: "HERS Rater Information", "Training with CalCERTS, inc.", and "Homeowner Information". A "RECENT NEWS" section is on the right, featuring a "CALIFORNIA ENERGY COMMISSION ADVISORY" about essential construction workers. At the bottom, there are three boxes: "Get Certified as a HERS Rater", "Compliance FAQ", and "Tips for Energy Savings".

Home Energy Rating System (HERS)

CHEERS

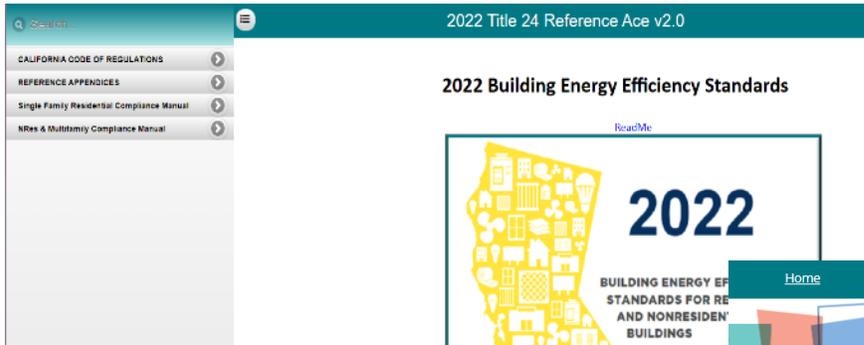
www.cheers.org

The screenshot shows the CHEERS website homepage. At the top left is the CHEERS logo. To the right are navigation links: "Getting Started", "Products & Services", "Resources", and a "SIGN IN" button. The main content area features a large banner for "Energy Consultants, Architects & Designers" with a background image of architectural tools and a blueprint. Below the banner is a "REGISTER NOW" button. Below the banner is a section for "Home Energy Rating System (HERS)".

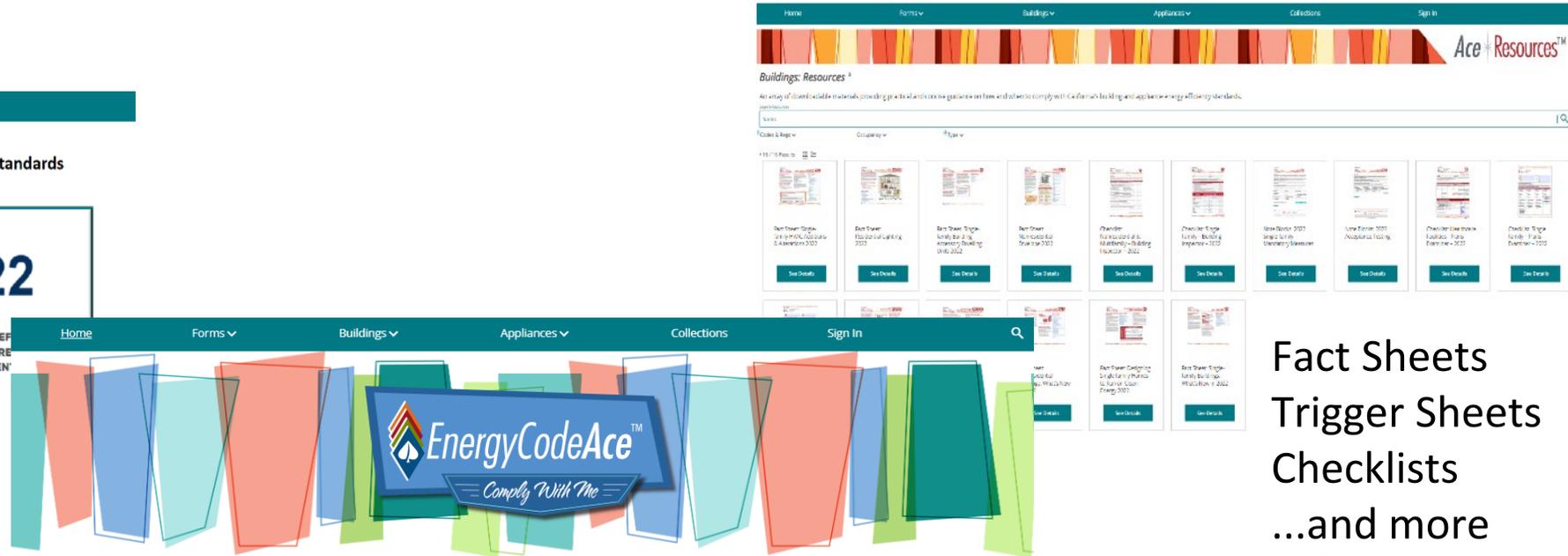
Organizations specializing in HERS services and "Title 24" low rise residential documentation registration needed for building permit approval and construction verifications.



Energy Code Ace energycodeace.com



Title 24 Part 6 Energy Code
Title 20 Appliance Standards
Res and Non-Res Manuals



Fact Sheets
Trigger Sheets
Checklists
...and more

Your one-stop shop for no-cost tools, training and resources to help you comply with California's [Title 24, Part 6 building energy code](#) and [Title 20 appliance standards](#). We're powered by the California Statewide Codes & Standards Program and vetted by the California Energy Commission.

Ace Tools™

A suite of interactive tools to help you understand the compliance process, required forms, installation techniques and energy efficiency regulations applicable to building projects and appliances in California.

Find Tools

Ace Training™

A portfolio of on-demand, and live in-person and online training alternatives on California's Energy Code and Title 20 regulations, tailored to a variety of industry professionals and addressing key measures.

Find Training

Ace Resources™

An array of downloadable materials providing practical and concise guidance on how and when to comply with California's building and appliance energy efficiency standards.

Find Resources



More from the CEC... Energy.ca.gov

The screenshot shows the California Energy Commission website. At the top left is the CEC logo. A search bar is located at the top right. A navigation menu includes links for HOME, PROCEEDINGS, RULES AND REGULATIONS, PROGRAMS AND TOPICS, FUNDING, DATA AND REPORTS, and SHOWCASE. Below the navigation is a breadcrumb trail: California Energy Commission > Newsroom > Blueprint Newsletter. The main content area features a large blue wireframe image of a building and the title "Blueprint Newsletter". Below this is a paragraph describing the newsletter and an "Expand All" link.

CALIFORNIA ENERGY COMMISSION

Enter keywords, e.g. Tracking Progress

HOME PROCEEDINGS RULES AND REGULATIONS PROGRAMS AND TOPICS FUNDING DATA AND REPORTS SHOWCASE

California Energy Commission > Newsroom > Blueprint Newsletter

Blueprint Newsletter

Blueprint is the California Energy Commission's quarterly e-newsletter that delves into the Building Energy Efficiency Standards and provides examples of projects. The newsletter provides updates, answers to frequently asked questions, clarifications to requirements, announcements, and educational resources and training.

Expand All

- 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

NEWSROOM

News Releases

Highlights

Blog

Blueprint Newsletter

The screenshot shows the content of the Blueprint Newsletter. At the top, it indicates "Issue 129" and "January - March 2020". The title "BLUEPRINT" is prominently displayed, followed by "CALIFORNIA ENERGY COMMISSION" and "EFFICIENCY DIVISION". The main content is divided into three columns: "IN THIS ISSUE", "2019 Energy Code: Focus on Lighting", and "Nonresidential Lighting Changes". The "IN THIS ISSUE" column contains a list of topics. The "2019 Energy Code: Focus on Lighting" column provides a detailed overview of the code changes. The "Nonresidential Lighting Changes" column discusses the impact of LED lighting on energy consumption.

Issue 129 January - March 2020

BLUEPRINT

CALIFORNIA ENERGY COMMISSION
EFFICIENCY DIVISION

IN THIS ISSUE

- 2019 Energy Code: Focus on Lighting
 - Nonresidential Lighting Changes
 - Residential Lighting Changes
 - Future Energy Codes
- 2019 Energy Code: Central Heat Pump Water Heaters
- Covid-19 Essential Workers
- 2019 Energy Code: PV Requirements for ADUs
- 2019 Energy Code: Updated Cool Roof Brochures
- 2019 Energy Code: Approved Lighting ATTCPs
- Q&A
 - Calculation of Allowed Indoor Lighting Power
 - Outdoor Solar Powered Lighting

2019 Energy Code: Focus on Lighting

California's Building Energy Efficiency Standards (Energy Code) have continued to evolve since 1978. Statewide over the past 40 years, the Energy Code has not only helped save energy, but has also saved Californians billions of dollars on their utility bills.

The 2019 Energy Code went into effect on January 1, 2020, and brought some significant changes to residential and nonresidential buildings. For the first time, newly constructed homes are required to utilize a photovoltaic (PV) system to generate renewable energy. Overall, single-family homes will use 53 percent less energy than those built under the 2016 Energy Code, after accounting for more rigorous efficiency measures and renewable energy generation.

Nonresidential buildings will use 30 percent less energy than those built under the 2016 Energy Code. A significant portion of those savings are attributed to changes in the lighting requirements.

Nonresidential Lighting Changes

The biggest change is to the prescriptive indoor and outdoor lighting power allowances. Under the 2016 Energy Code, high performance T8 linear fluorescent lighting was used as the baseline for indoor lighting power density (LPD) calculations. Under the 2019 Energy Code, the baseline is LED lighting. The shift to LED lighting has significantly reduced LPDs. On average, indoor LPDs have been reduced by 28 percent when utilizing the area category method of compliance. This accounts for the single largest energy savings of all changes in the 2019 Energy Code. Because LED lighting is already widely used in the industry, this may not have a substantial effect on the way lighting systems are designed. It will, however, effect the overall energy consumption of these buildings, allowing less energy trade-offs between lighting and other aspects of the building, like the building envelope.

1

<https://www.energy.ca.gov/newsroom/blueprint-newsletter>

Housing and Community Development (Title 25)

www.hcd.ca.gov/building-standards

Home > Building Standards > Manufactured & Factory-Built > Factory-Built Housing

Factory-Built Housing

The purposes of the Factory-Built Housing (FBH) Program are to ensure the health and safety of persons using or purchasing factory-built homes or FBH building components, and to provide California residents with reduced housing costs through mass production techniques resulting from a factory production environment.

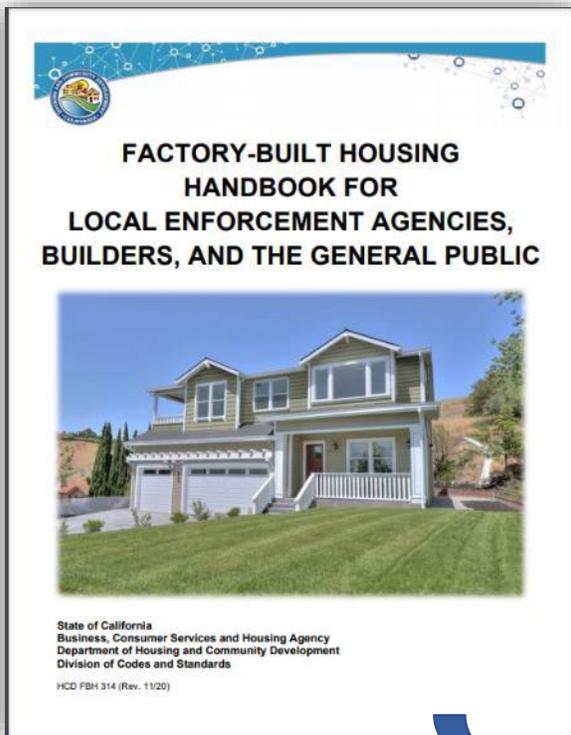
In order to achieve these responsibilities, the following activities are conducted by the Department of Housing and Community Development (HCD) pursuant to the Health and Safety Code, commencing with Section 19960.

- Plan check of FBH designs through HCD-approved Design Approval Agencies.

Applicable Laws, Regulations and Construction Standards

Factory-Built Housing Code Matrix

 Laws and Regulations	 Construction Standards (Ref. HSC Section 19990, Title 25, CCR Section 3070)	 Building Accessibility
Laws: California Health and Safety Code, Division 13, Part 6, section 19960, et seq. Regulations: Title 25, California Code of Regulations, Division 1, Chapter 3, Subchapter 1, section 3000, et seq.	Title 24, California Code of Regulations, California Building Standards Code Part 2 California Building Code Part 2.5 California Residential Code Part 3 California Electrical Code Part 4 California Mechanical Code Part 5 California Plumbing Code Part 6 California Energy Code Part 11 California Green Building Standards Code	Title 24, California Code of Regulations, Part 2 (California Building Code), Chapters 2, 11A ⁴ and 11B ⁵



Factory-Built Housing (FBH)
 FBH is a factory-constructed version of a site-built residential building that is manufactured and then transported to its permanent installation location.

FBH may include:

- Single-family dwellings
- Multifamily dwellings
- Dormitories
- Hotels
- Miscellaneous
- FBH components

FBH Program purpose:

- To ensure the health and safety of persons using or purchasing FBH or FBH building components, and
- To provide California residents with affordable housing through mass production techniques.

State of California
Department of Housing and Community Development
Division of Codes and Standards
Factory-Built Housing Program

P.O. Box 278180
Sacramento, California 95827
P: 800.952.8356
P: 916.854.2364
www.hcd.ca.gov

FREQUENTLY ASKED QUESTIONS

Who inspects the installation of FBH on-site?
 The LEA, or building department, is responsible for inspecting the assembly and installation of FBH products on-site.

How does the LEA know what to inspect during the installation of FBH?
 The LEA utilizes IDAA approved plans and a source of work that is pertinent to FBH installation to inspect FBH.

How can I stay up-to-date on FBH news and information from HCD?
 Sign up for HCD's email distribution list at the following link: www.hcd.ca.gov. Click on CONTACT at the top right, then click on the "Email Sign-up" button.

hcd.ca.gov 800.952.8356

Questions about Title 24?

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

Online:
3c-ren.org/codes

Call:
805.781.1201

Energy Code Coaches are local experts who can help answer your Title 24 questions. Coaches have decades of experience in green building and energy efficiency improvements. They can provide citations and offer advice for your project to help your plans and forms earn approval the first time.

Closing

- Continuing Education Units Available
 - Contact shuskey@co.slo.ca.us for AIA and ICC LUs
- Coming to Your Inbox Soon!
 - Slides, Recording, & Survey – Please Take It and Help Us Out!
- Upcoming Courses:
 - January 18 - [Using Life Cycle Assessment & Embodied Carbon Calculators to Make Design and Product Choices](#)
 - January 24 - [Batteries: Options and implementation for a building's energy storage system](#)
 - January 30 - [Intro to Residential HVAC Systems](#)
 - January 31 - [Energy Code Compliance: Using HERS Measures \(Part 1\)](#)
- Visit www.3c-ren.org/events for our full catalog of trainings.





Thank you!

For more info:
3c-ren.org

For questions:
info@3c-ren.org



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