

# CaIBEM 2023

**Will Vicent**

Deputy Director, Building Standards  
California Energy Commission

October 18, 2023











# California Climate Action

## Electricity – Senate Bill 100

...renewable energy resources and zero-carbon resources supply 100% of retail sales of electricity to California end-use customers...by December 31, 2045.

## Transportation – Executive Order N-79-20

...100 percent of in-state sales of new passenger cars and trucks will be zero-emission by 2035.

## Buildings & Economy – Executive Order B-55-18

...achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain a net negative emissions thereafter.





# CEC Building Standards Team

## Standards Leadership

- Vacant
- Payam Bozorgchami
- Haile Bucaneg
- Javier Perez
- Muhammad Saeed
- Bach Tsan

## Compliance Leadership

- Lorraine White
- Joe Loyer
- Cheng Moua
- Daniel Wong

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- Simon Lee
- Anushka Raut
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- Thao Chau
- Kyle Grewing
- Trevor Thomas
- RJ Wichert
- Vacant

## Nonres Compliance

- Charlie Opferman
- Rinnie Kaur
- Vacant
- Vacant

## Res Compliance

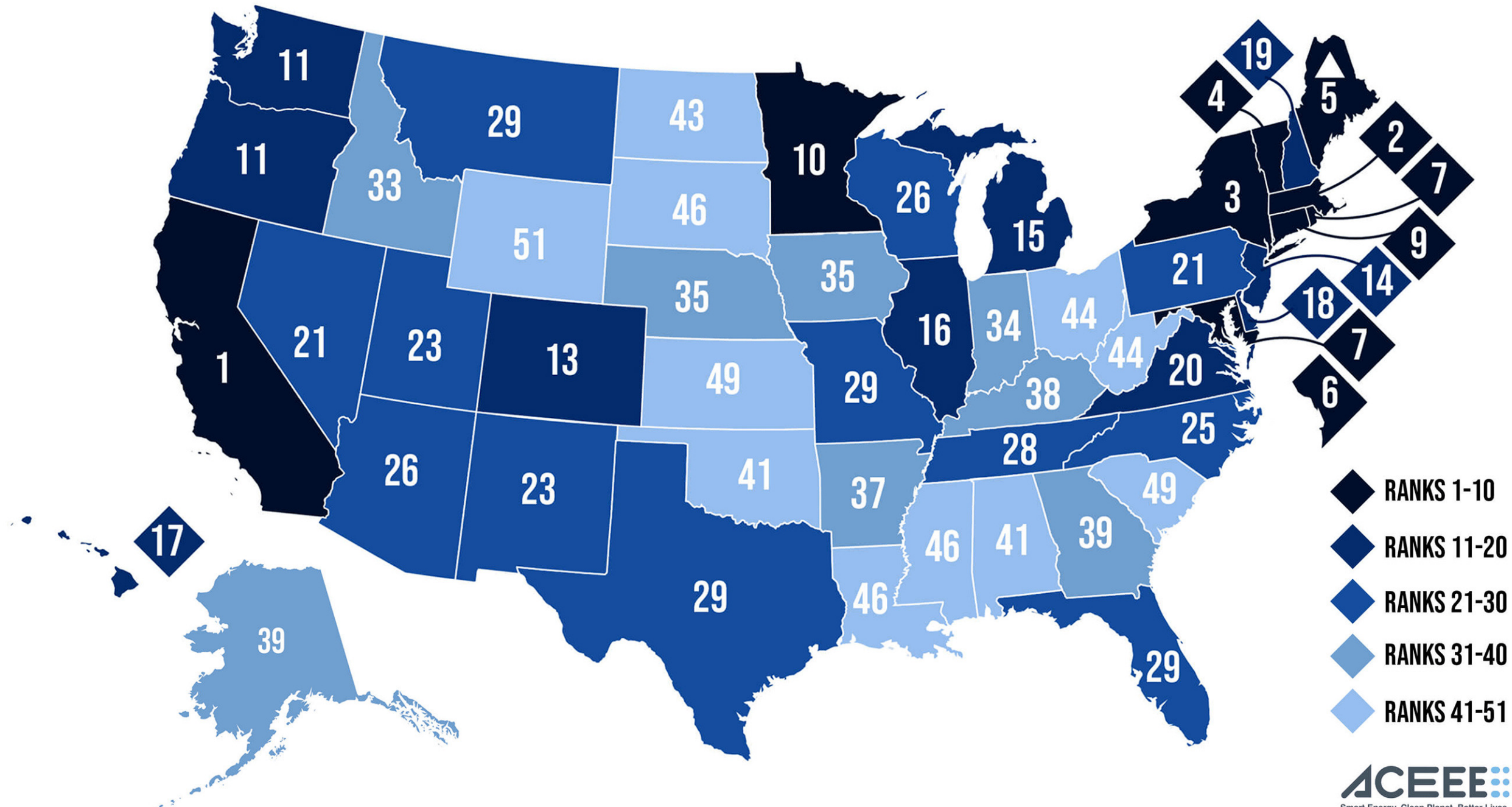
- Vacant
- Armando Ramirez
- Judy Roberson
- Maxwell Crosby
- Vacant
- Vacant

## Compliance Analysis

- Vacant
- Archie Etikala
- Vacant
- Vacant

## Outreach & Education

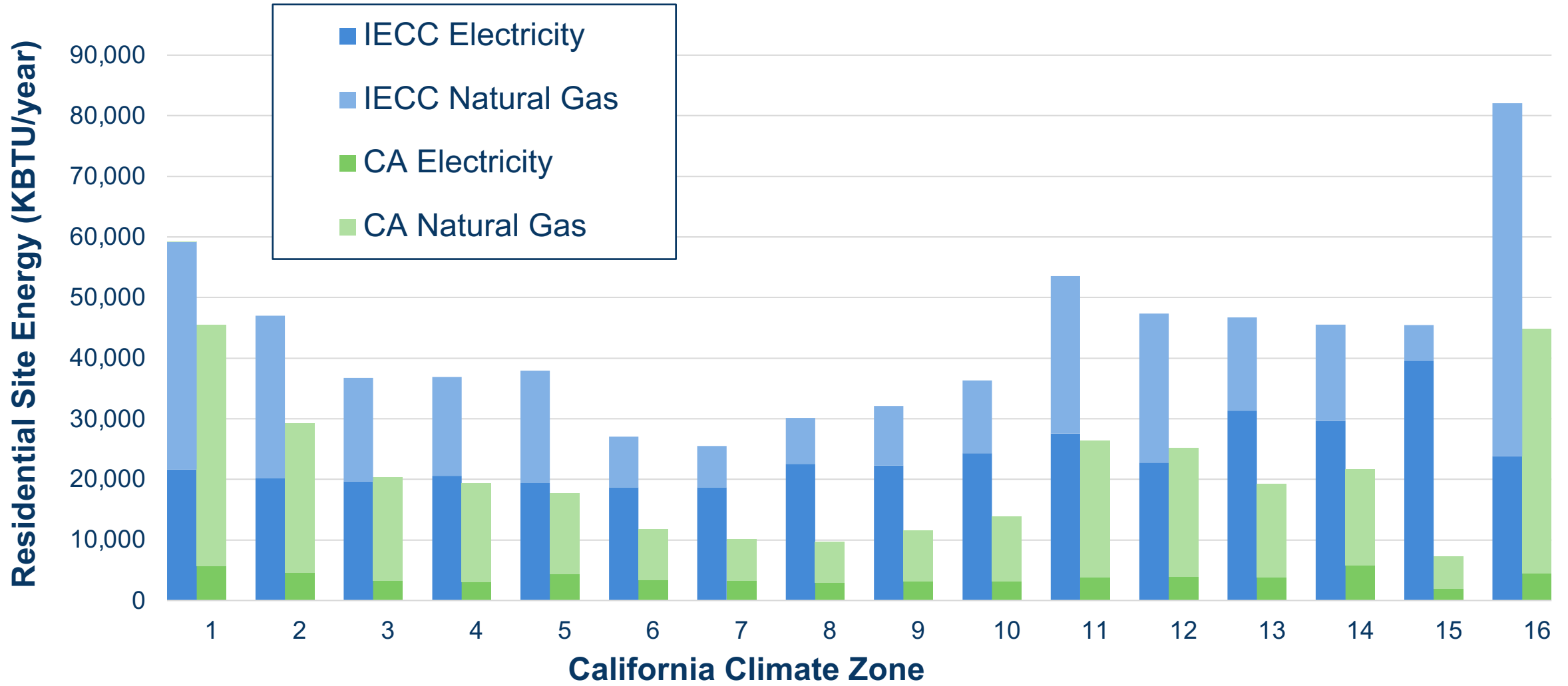
- Chris Olvera
- Amie Brousseau
- Elmer Mortel
- Che Nyendu
- Gagandeep Randhawa
- Allen Wong
- Hamza Zahriya
- Saqif Khan
- Nathan Seyoum
- Alexis Abel
- Elinore Loyer



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- ◆ RANKS 11-20
- ◆ RANKS 21-30
- ◆ RANKS 31-40
- ◆ RANKS 41-51

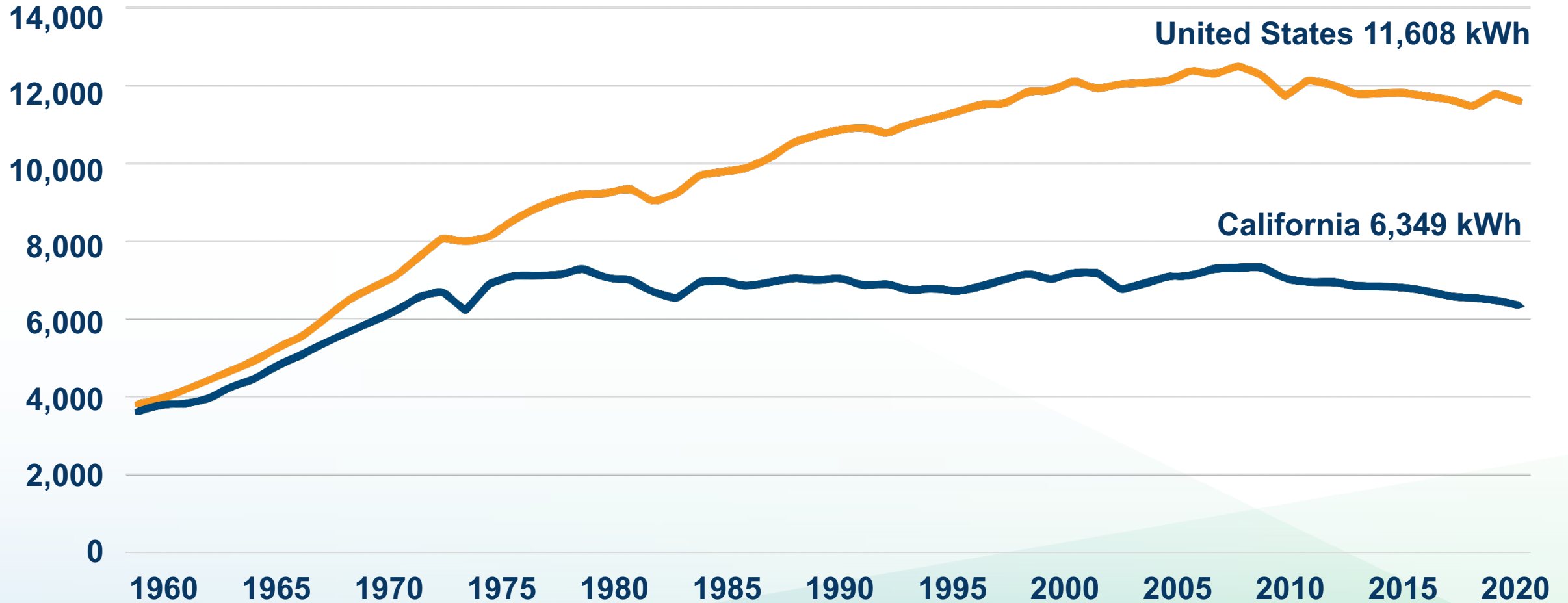


# 2022 Energy Code Vs. 2021 IECC





# Annual Energy Use Per Person





# 2025 Energy Code





# 2025 Energy Code Timeline

Milestone	Target Dates
CEC Kickoff Workshop – Compliance Tools & Templates	March 22, 2022
Deadline to Submit New Measures ( <a href="http://title24stakeholders.com">title24stakeholders.com</a> )	April 15, 2022
CEC Energy Code Accounting Workshops	Through October 2022
Research Version of Energy Code Compliance Software	October 2022
Utility-Sponsored Workshops	August 2022 – April 2023
Utility-Sponsored CASE Measure Reports to CEC	April 2023 – August 2023
CEC Preliminary Rulemaking Workshops	June 2023 – October 2023
File & Open Formal Rulemaking	October 2023 – January 2024
Start 45-Day Public Comment Period	January 2024
Start 15-Day Public Comment Period	May 2024
CEC Adoption	June 2024
Effective Date	January 1, 2026



# CA New Construction Rates

Measure Category	Rates	Source
Single Family Heat Pump Space Heaters	55%	Energy Code compliance registry of 50,856 CF-1R records
Single Family Heat Pump Water Heaters	16%	Energy Code compliance registry of 50,856 CF-1R records
Multifamily Heat Pump Space Heaters	83%	Energy Code compliance registry of 17,239 CF-1R records
Multifamily Heat Pump Water Heaters	TBD	TBD
Single Family All-electric	0.5% to 1.5%	Opinion Dynamics (CPUC) – Heat Pump Characterization & Baseline Study (2022)
Multifamily All-electric	7% to 13%	Opinion Dynamics (CPUC) – Heat Pump Characterization & Baseline Study (2022)





# Existing Buildings

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## Nonresidential HVAC Alterations Heat Pump Baselines

- In Title 24, Part 6 (Energy Code)
- For single-zone rooftop unit (RTU) replacements less or equal to 65,000 Btu/h in Climate Zones 2-15. Gas appliances can still be installed if paired with additional energy efficiency measures.

## Single Family HVAC Alterations Heat Pump Baselines

- Voluntary in Title 24, Part 11 (CALGreen)
- For local governments wishing to exceed the Energy Code by prescriptively requiring heat pumps when replacing ACs in Climate Zones 1-5, 11-13, and 16





**“the world is getting better, s-l-o-w-l-y.”**





# Energy Code Compliance



# Energy Code Reformat

2022 Building Energy Efficiency Standards

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Example:

1. Scope and Application (T-24, Part 1)
  - 1.1. Scope (table 100 etc.)
2. Administration and Enforcement (also from part 1)
  - 2.1. Raters requirements – responsible person etc.
  - 2.2. Discussion of forms Sections 10-xx
3. Definitions
4. Mandatory Requirements for All Occupancies (T-24, §110)
  - 4.1. HVAC equipment
  - 4.2. Water heating equipment
  - 4.3. Etc.

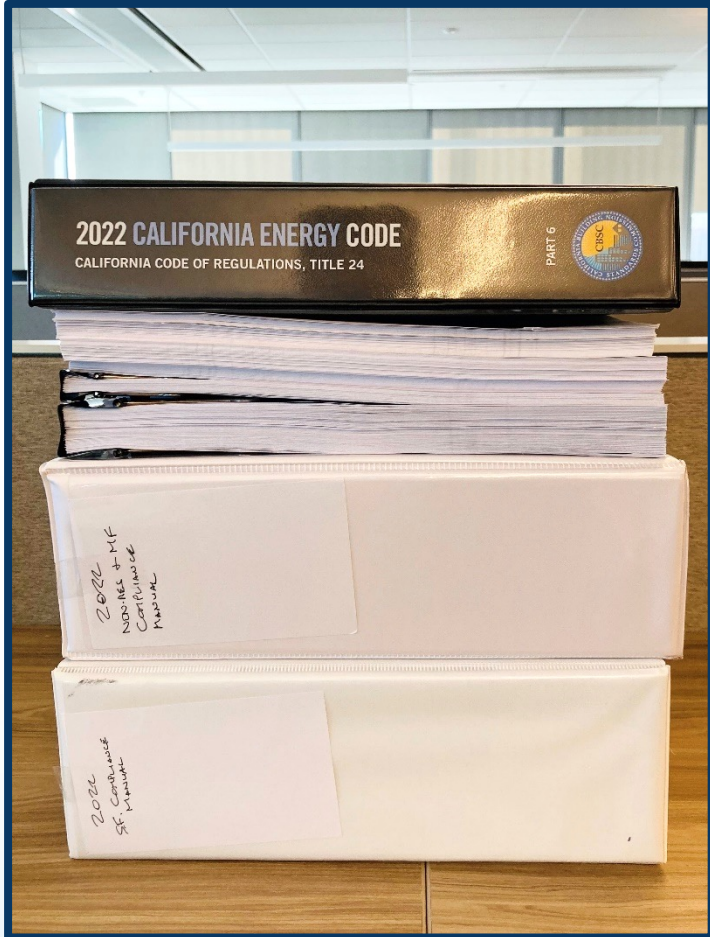
## R Residential

- R1. General
- R2. Envelope Requirements
  - R2.1. Envelope Mandatory
  - R2.2. Envelope Prescriptive
  - R2.3. Envelope Alternate Compliance (UA etc)
- R3. Space Conditioning Requirements
  - R3.1. Space Conditioning Mandatory
    - R3.1.1. Minimum ventilation
    - R3.1.2. No unvented combustion
    - R3.1.3. Controls
    - R3.1.4. Duct sealing
  - R3.2. Space Conditioning Prescriptive
    - R3.2.1. Central fan W/cfm
    - R3.2.2. Duct insulation levels
    - R3.2.3. Whole house fan





# Streamline Documents



## 2022

1. Energy Code Regulations
2. Reference Appendices
3. Data Reg. Requirements Manual
4. ACM Approval Manual
5. Residential ACM Ref. Manual
6. Nonres & MF ACM Ref. Manual
7. Residential Compliance Manual
8. Nonres & MF Compliance Manual

## 2025, 2028

1. Energy Code Regulations
2. Reference Appendices
3. Energy Conservation Manual



# Forms Digitization

## CF1R-ALT-05

### CERTIFICATE OF COMPLIANCE

[▶ more details](#)

#### ▼ Project Details

Project Name	*	Project Address
City, State	*	Zip Code
Enforcement Agency		Permit Number
Date Permit Issued		
yyyy-mm-dd		

#### ▼ A. General Information

Date Prepared	Building Front Orientation
www-mm-dd	<i>degree or cardinal</i>

- B. Building Insulation Details
- C. Roof Replacement
- D. & E. Fenestration/Glazing - Add
- D. & F. Fenestration/Glazing - Replace
- G. Space Conditioning (SC) Systems - Heating/Cooling
- H. Water Heating Systems
- Lighting
- Include Mandatory Measures?

#### ▼ Project Scopes Excluded From This Form

The following sections are not completed and not required to be completed as they are not a part of the Project Scope.

C. Roof Replacement

D. Fenestration/Glazing Allowed Areas and Efficiencies

E. Fenestration Proposed Areas and Efficiencies - Add

F. Fenestration/Glazing Proposed Areas and Efficiencies - Replacement

G. Space Conditioning (SC) Systems - Heating/Cooling

#### ▼ B. Building Insulation Details

##### » Add rows as needed

Tag/ID	Assembly Type
	Wall
Frame Type	Frame Depth (in)
Wood	2x6

<https://tinyurl.com/2yk5t82y>





# More Technical Assistance





# CBECC

CUAC-MF88Unit\_5Story\_ELEC-CZ12 - CBECC 2022

File Edit Ruleset View Tools Help

Envelope Mechanical

Project: 'MF88 Restructure Prototype'

- 2022 Prototype 113100ft2 Prop Elec (res only: 95)
- Building (6 stories / 112,641 cond ft2 / Orientation)
  - Building Story Nonresidential (Total = 17,613)
    - ResZn Group F1 (4,932 ft2 other/common (3)
      - F1 Business Center (Conference, Mu
      - F1 Corridor (Corridor Area, Directly C
      - F1 Fitness Center (Exercise/Fitness C
      - F1 Leasing Office (Office Area (>250
      - F1 Lobby (Lobby, Main Entry, Directly
      - F1 Mech Rm (Electrical, Mechanical,
      - F1 Stairs E (Stairwell, Directly Condit
      - F1 Stairs W (Stairwell, Directly Condit
    - ResZn Group F2 (22 dwellings (19,740 ft2) 8
    - ResZn Group F3 (22 dwellings (19,740 ft2) 8
    - ResZn Group F4 (22 dwellings (19,740 ft2) 8
    - ResZn Group F5 (22 dwellings (19,740 ft2) 8
    - ResZn Group UG Garage (27,900 ft2 other/c
    - UG Garage (Parking Garage Area (Pa
      - UG Garage UG Wall - Front (Be
      - UG Garage UG Wall - Left (Belo
      - UG Garage UG Wall - Back (Be
      - UG Garage UG Wall - Right (Be

Ready

### Building Model Data

Project | Team | Narrative | Analysis Options | PV/Battery | Forms | Exceptional Conditions | CUAC | CALGreen | E+ Variables | Utility Rates

Enable CUAC Reporting Report: **Draft**

PV Allocation: (75% of total 265.4 kWdc PV allocated)

Site Location: (enter on 'Project' tab)

Unit Type	# Affordable	Total
Studio	8	8
1 Bedroom	40	40
2 Bedroom	32	32
3 Bedroom	8	8
4 Bedroom		
5 Bedroom		
6 Bedroom		
<b>Totals</b>	<b>88</b>	<b>88</b>

Project Identification

Project ID:

Locality:

Unit Type:

APN:

Other ID:

Building Owner

Name:  Address:

City, State Zip:

CUAC Contact

Name:  ph:  e-mail:

#### Electric Utility

Name: **SMUD -- Sacramento Municipal Utility District**

Territory: Palo Alto -- Palo Alto Utilities Department

Pasadena -- Pasadena Water and Power

PG&E -- Pacific Gas and Electric Company

Gas Utility: PP&L-DN -- Pacific Power and Light Company (Del Norte County)

PP&L-Othr -- Pacific Power and Light Company (except Del Norte)

P-SREC -- Plumas Sierra Rural Electric Cooperative

Rancho -- Rancho Cucamonga Municipal Utility

Redding -- Redding Electric Utility

Riverside -- Riverside Public Utilities

Roseville -- Roseville Electric

SCE -- Southern California Edison

SDG&E -- San Diego Gas and Electric Company

SFPUC -- SF Public Utilities Commission

Shelter -- Shelter Cove Resort Improvement District

Silicon -- Silicon Valley Power

SLMU -- Shasta Lake Municipal Utility

**SMUD -- Sacramento Municipal Utility District**

SVEC -- Surprise Valley Electrification Corporation

TDPUD -- Truckee Donner Public Utility District

TID -- Turlock Irrigation District

TID-West -- Turlock Irrigation District Westside Zone

Trinity-A -- Trinity Public Utilities District Zone A



# Much More Underway

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- Lowrise Multifamily Forms & Registry
- Field Verification & Diagnostic Testing Requirements
- Commission Compliance Documents Repository
- Federal Funding to Improve Compliance





# Home Energy Ratings





# Overview

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- Public Resources Code 25942 directs CEC to “...establish criteria for adopting a statewide home energy rating program for residential dwellings.”
- Regulations exist in Title 20, sections 1670-1675
- Need to Update
  - Last updated in 2009, does not reflect current codes
  - Software and implementation tools out of date
  - Landscape of energy programs and tools have evolved
  - Growing consumer interest in climate action



# Real Estate Listings



**\$3,611**

Estimated monthly cost

Principal & interest  
\$2,871/mo

Mortgage insurance  
\$0/mo

Property taxes  
\$460/mo

Home insurance  
\$280/mo

HOA fees  
N/A

Utilities  
Not included

All calculations are estimates and provided for informational purposes only.  
Actual amounts may vary.

4 ba | 1,868 sqft

102 Citysquare, Irvine, CA 92614

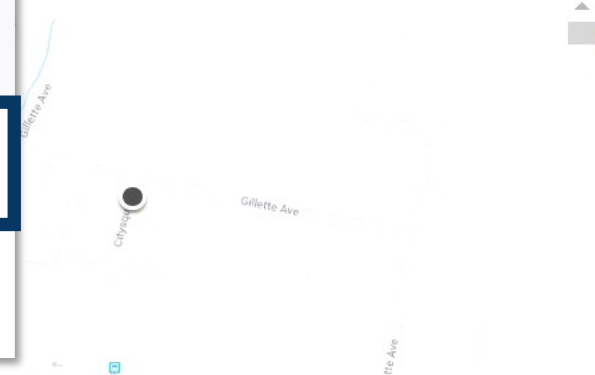
estimate®: \$798,142

[\\$ Get pre-qualified](#)

[Contact builder](#)

[website](#)

[Features](#) [Contact](#) [Community features](#)







# Danish Energy Agency

ENERGISTYRELSEN

**ENERGIMÆRKNINGSRAPPORT**  
ENERGIMÆRKE OG FORSLAG TIL ENERGIFORBEDRINGER

Rudbølvej 50  
6280 Højer

**DIN BOLIG HAR ENERGI-MÆRKE** D

Du betaler hvert år **24.200 kr.** mere, end du behøver i energiudgifter\*

**ENERGIKONSULENTENS BEDSTE ANBEFALINGER**

- 1** Konvertering til varmepumpe og Installation af ny luft/vand varmepumpe

Årlig besparelse: 21.000 kr.  
Investerings: 128.000 kr.
- 2** Efterisolering af loftsrum med 150 mm isolering

Årlig besparelse: 1.700 kr.  
Investerings: 44.000 kr.
- 3** Udskiftning af eksisterende vinduer og døre

Årlig besparelse: 3.400 kr.  
Investerings: 82.100 kr.

**DIT ÅRLIGE BESPARELSESPOTENTIALE\***

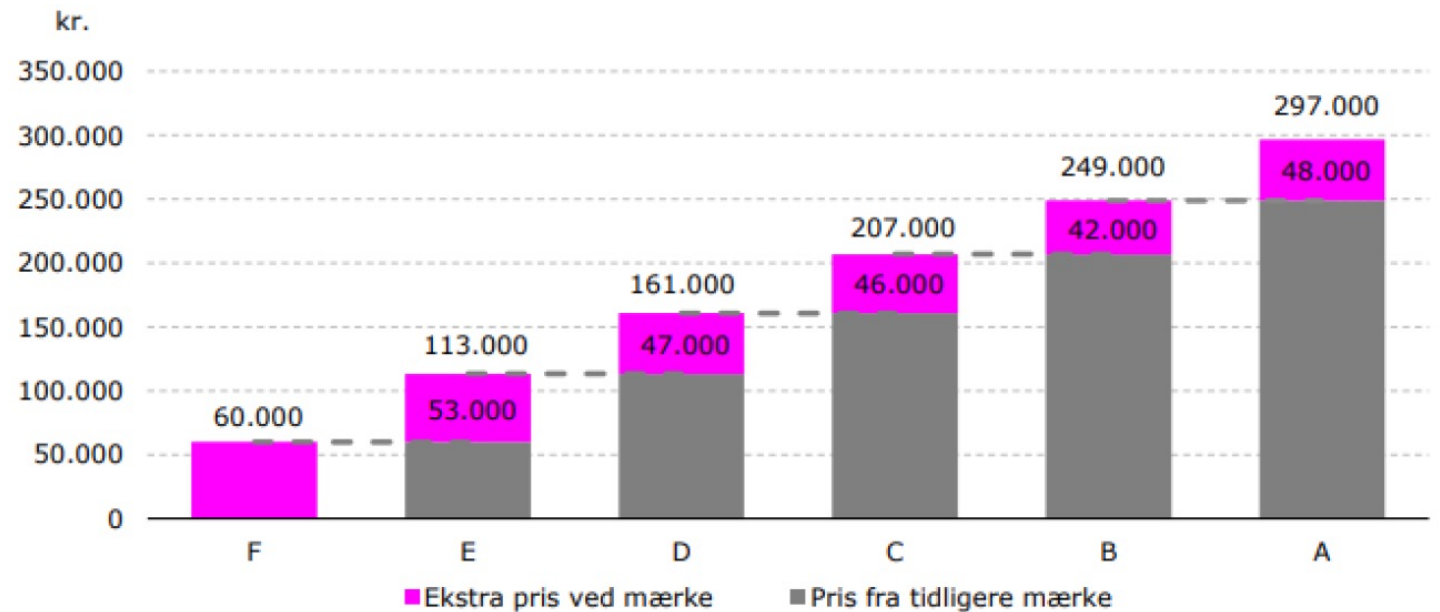
	IDAG	EFTER RENTABLE TILTAG	DU SPARER ÅRLIST
Fyringspælsolie	28.000 kr.	0 kr.	28.000 kr.
El til opvarmning	4.300 kr.	7.900 kr.	-3.600 kr.
El til andet	14.800 kr.	15.000 kr.	-200 kr.
Såmet energiudgift	47.100 kr.	22.900 kr.	24.200 kr.
Såmet CO <sub>2</sub> -udledning	7,44 ton	2,29 ton	5,14 ton

**FORBEDRING AF ENERGI-MÆRKET VED GENNEMFØRELSE AF ALLE RENTABLE FORSLAG:**

**A A A B C D E F G**

\* Talene er baseret på en standardiseret brug af bygningen. Se siden: FORMÅLET MED ENERGI-MÆRKNINGEN.

**Figur 1 Sammenhæng mellem boligpris og energimærker**





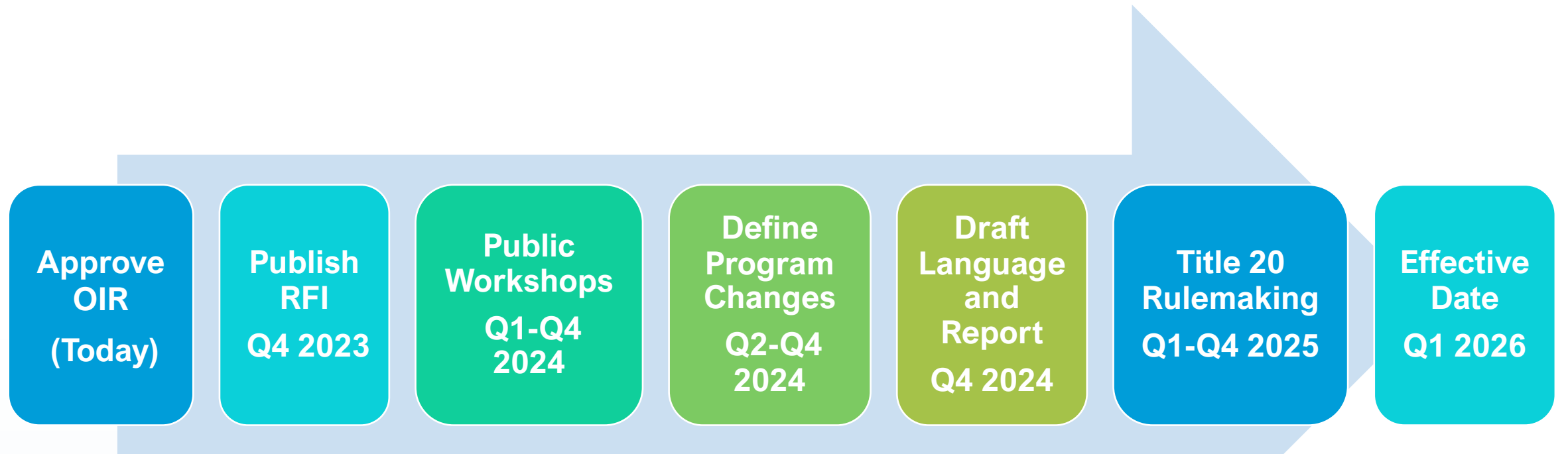
# Benefits to Californians

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- Empowers **consumers** to participate in clean energy
- Differentiates CA **builder and developer** products from national averages
- Provides building **designers** with clear consistent clean energy targets
- Encourages **compliance** with Energy Code
- Compliments **public subsidies** advancing building decarbonization
- Links **finance and real estate** to attract more investments in clean energy
- Bridges public investments to **stand alone investments**



# Home Energy Ratings Timeline





# CaIBEM 2023

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California Energy Commission

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