2022 Energy Code

Nonresidential Sign Lighting Requirements

California Energy Commission

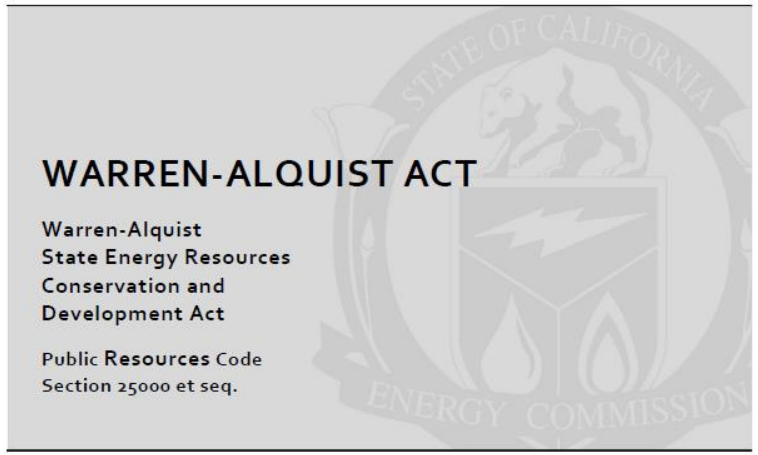
March 2024

Agenda

- 2022 Energy Code basics
- Nonresidential requirements
  - Mandatory
  - Prescriptive
  - Additions and alterations
- Resources

2022 Energy Code Basics

Energy Code History

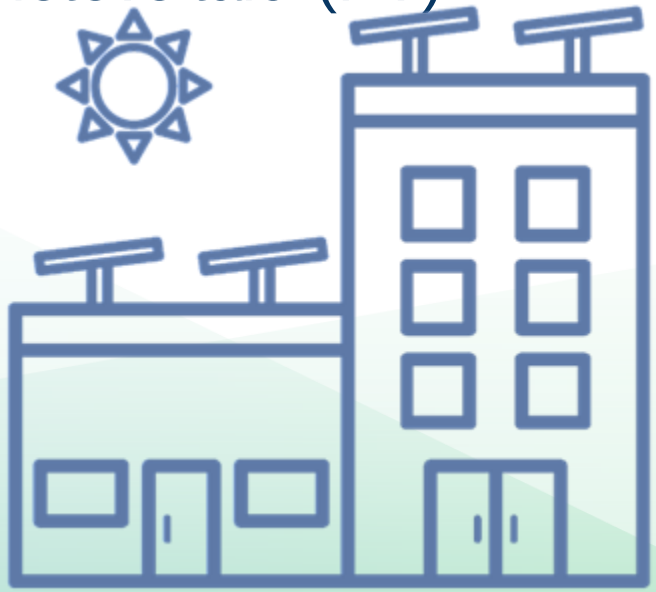


Warren-Alquist Act established CEC in 1974

- Authority to develop and maintain Building Energy Efficiency Standards (Energy Code)
- Requires CEC to update periodically, usually every 3 years
- Requires Energy Code to be cost-effective over economic life of building

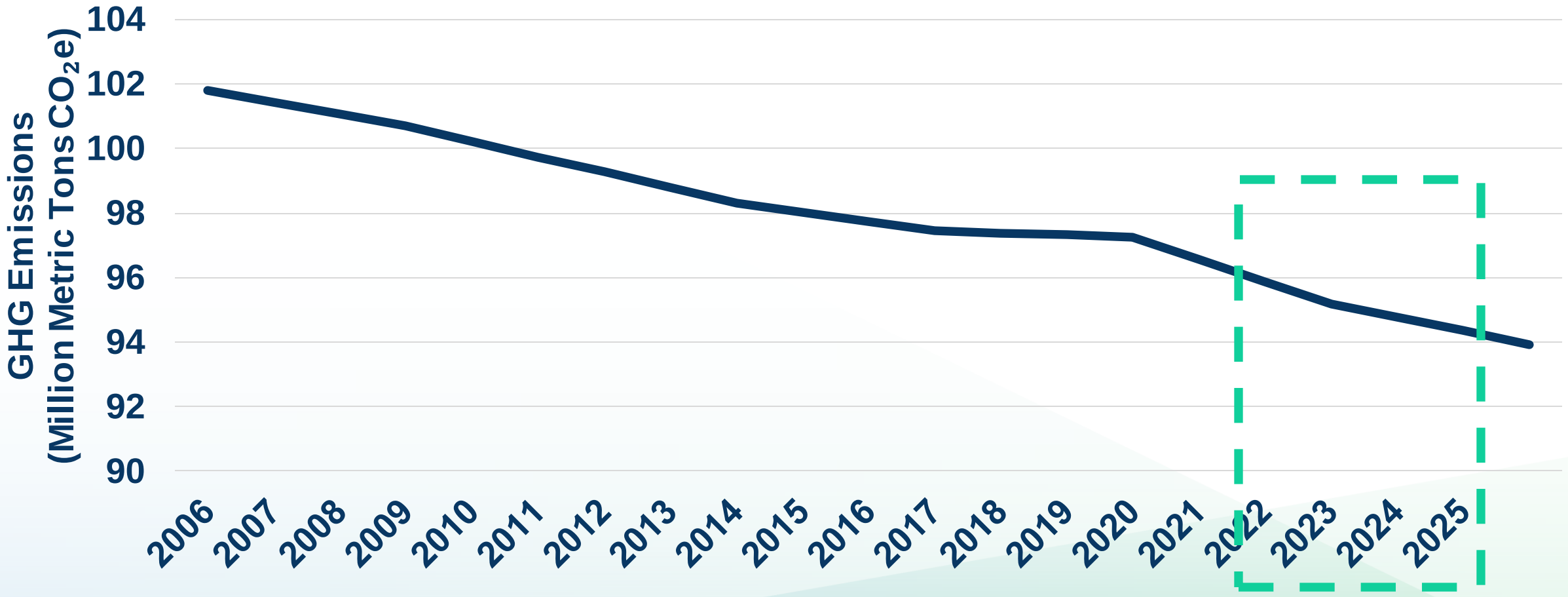
2022 Energy Code Goals

- Increase building energy efficiency cost-effectively
- Contribute to California's greenhouse gas (GHG) reduction goals
- Enable pathways for all-electric buildings
- Reduce residential building impacts on the electricity grid
- Promote demand flexibility and self-utilization of photovoltaic (PV)
- Provide tools for local government reach codes



Energy Code Environmental Benefit

Reduced Statewide Emissions

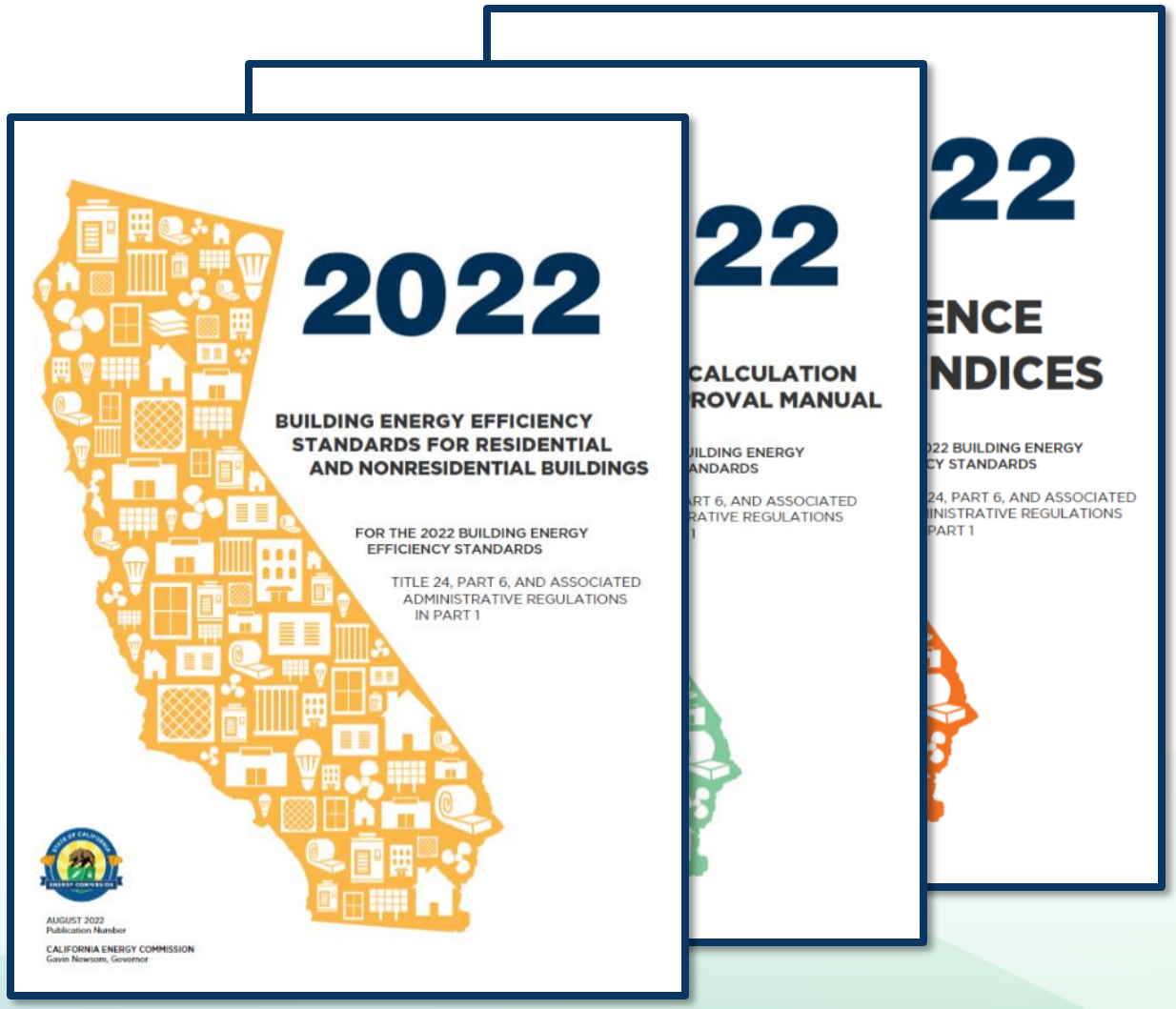


Source: CEC Impact Analysis 2005, 2008, 2013, 2016, 2019, 2022

2022 Energy Code

Effective January 1, 2023

- Building permit applications submitted on or after Jan 1, 2023
- Must use 2022 tools
  - Software
  - Forms

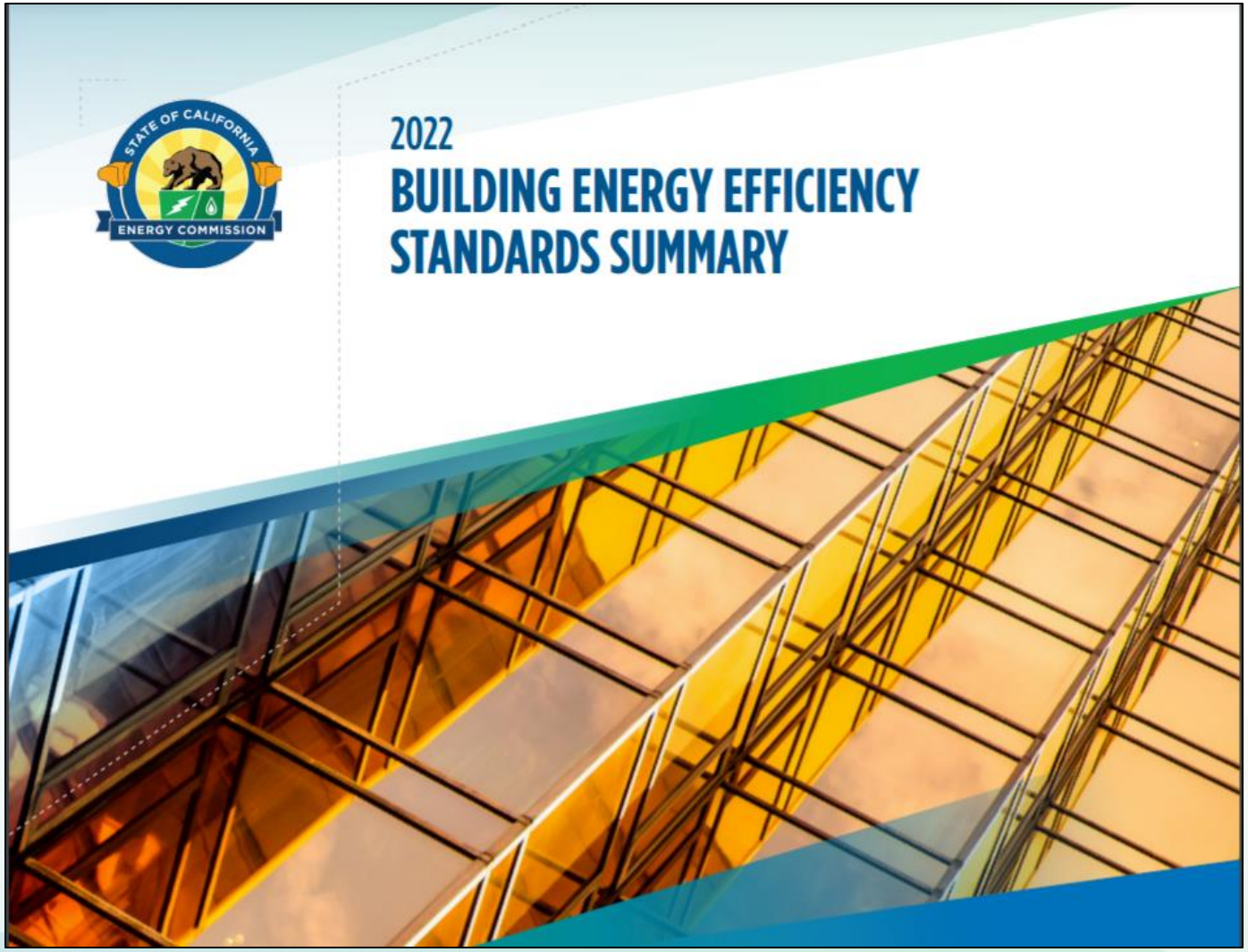


2022 Documents Online

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

2022 Energy Code Highlights

- Heat pump baselines
- Solar and battery storage
- Ventilation requirements
- Lighting
- Multifamily restructuring



Energy Code Requirements

Mandatory requirements

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

Prescriptive requirements

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

Compliance Approaches

Prescriptive approach

- Simple approach, no trade-offs
- Defines the standard building design
- 2022 heat pump baselines

Performance approach

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

2022 Performance Metrics

New for 2022

Source energy performance calculations

- Nonresidential and multifamily
  - Hourly source energy
  - TDV Efficiency
  - TDV Total
    - Efficiency, PV + battery

Demonstrating Compliance

- **Compliance forms confirm Energy Code is met**

Updated for 2022

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

Type of form	Single-family	Multifamily 3 or less habitable stories	Nonresidential Multifamily 4 or more habitable stories
Certificate of compliance	CF1R	LMCC	NRCC
Certificate of installation	CF2R	LMCI	NRCI
Certificate of verification	CF3R	LMCV	NRCV
Certificate of acceptance	-	-	NRCA

Forms Registration and Certification

All Buildings § 10-103

Updated for 2022

Multifamily buildings 3 or fewer habitable stories

- When HERS verification is required all LMCC, LMCI, and LMCV forms must be registered with HERS provider data registry

Multifamily buildings 4 or more habitable stories

- NRCV must be registered with HERS provider when required
- When lighting or mechanical acceptance test is required all NRCC, NRCI, and NRCA forms must be recorded with ATTCP

2022 Compliance Software

Performance approach must use approved compliance software versions

- Nonresidential and multifamily
  - CBECC 2022.3.0
  - EnergyPro 9.2
  - IES 2.0

Mandatory Requirements

130.3(a) Sign Lighting Controls

Sign lighting control requirements apply to nonresidential and hotel/motel buildings; do not apply to healthcare facilities.

1. **Indoor signs** (except for exit signs) must be controlled by an automatic time-switch control or an astronomical time-switch control.

2. **Outdoor signs:**

   A. Must be controlled with Automatic time-switch and photosensor, or astronomical time-switch control. Exceptions for tunnels and permanently covered outdoor areas that are lit 24 hours per day, 365 days per year.

   B. Signs on at night and more than 1 hour during day must have dimmer that can automatically reduce power by ≥ 65% at night. Exceptions for tunnels and large covered areas illuminated both day and night.

130.3(a)3, 110.12 Demand Responsive Electronic Message Center Control

Controls for an **Electronic Message Center** (EMC) with load > 15 kW must:

- Be capable of automatically **reducing lighting power by a minimum of 30%** in response to a demand response signal; and
- Be a certified OpenADR 2.0a or 2.0b Virtual End Node (VEN) or certified as being capable of responding to OpenADR 2.0b VEN.
  - More information is available at the CEC's Demand Responsive Lighting Control webpage
- **Exception:** EMCs not permitted by health or life safety statute, ordinance, or regulation to be reduced.

Prescriptive Requirements

140.8 Prescriptive Requirements for Signs

Compliance with sign lighting power will be based on wattage allowance or usage of specific light source types:

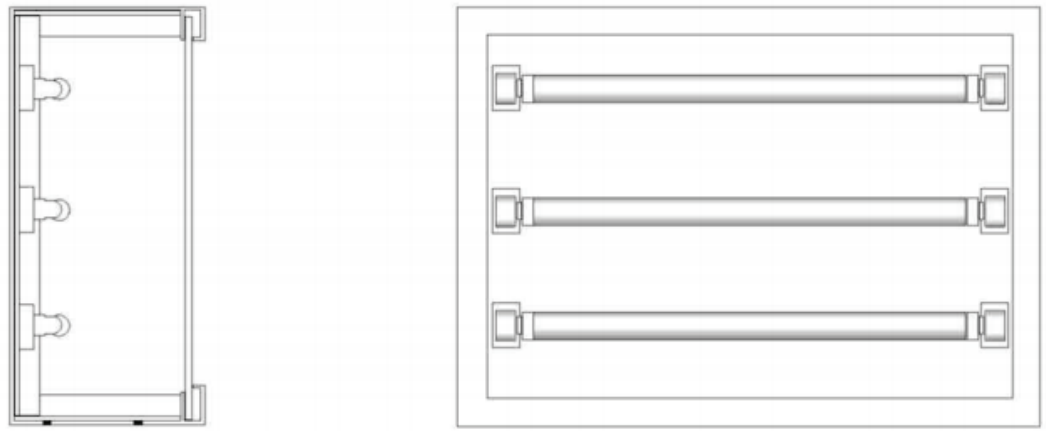
- **Maximum Allowed Lighting Power (wattage allowance)**
  - Internally illuminated signs: 12 watts/square foot
  - Externally illuminated signs: 2.3 watts/square foot
- **Alternate Lighting Sources**
  - Automatically complies if specific light sources are used
  - Unfiltered LEDs and neon must comply with alternate lighting sources method
- **Exceptions**
  - **Unfiltered incandescent lamps** that are not part of an electronic message center (EMC), an internally illuminated sign, or an externally illuminated sign.
  - **Exit signs** shall meet the requirements of the Appliance Efficiency Regulations.
  - **Traffic signs** shall meet the requirements of the Appliance Efficiency Regulations.

140.8(a)1 Maximum Allowed Lighting Power

Internally illuminated signs

- Allowed lighting power is the product of the illuminated face area and 12 watts/ft^2
- Double-faced signs use only the area of a single face

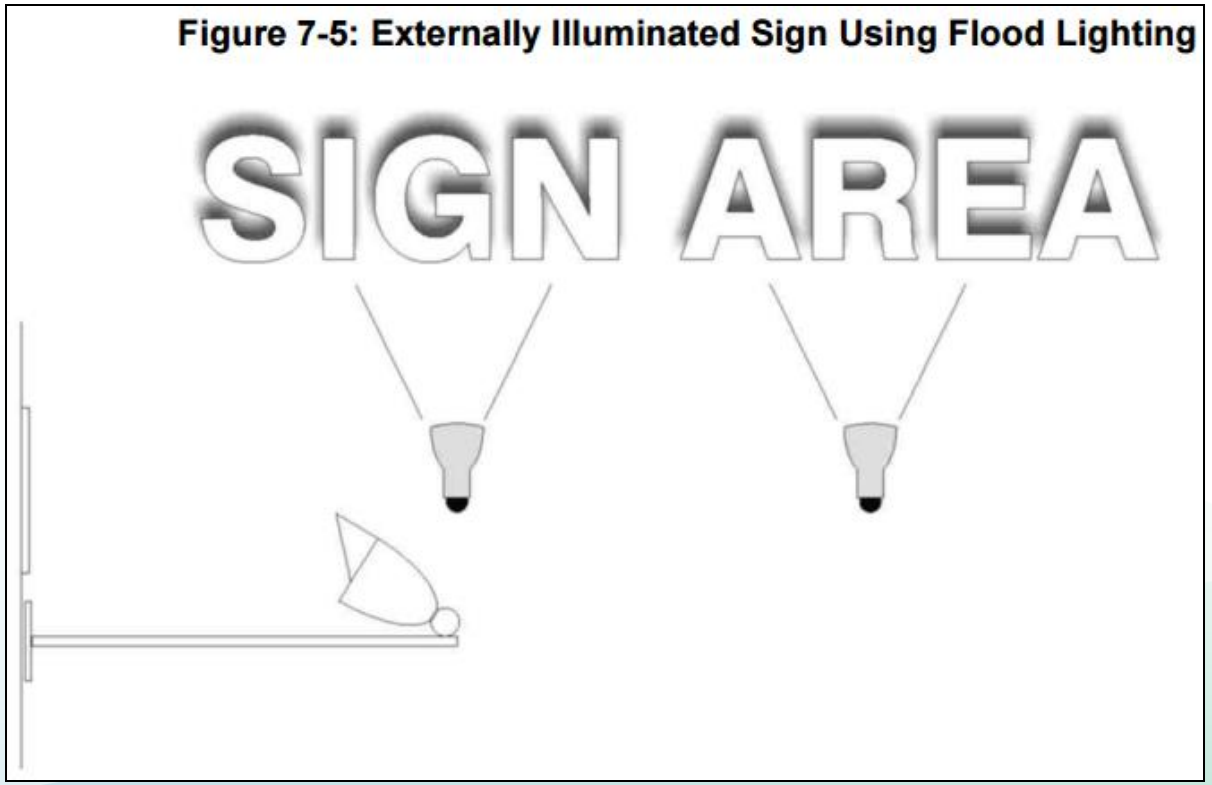
Figure 7-2: Single-faced Internally Illuminated Cabinet Sign with Fluorescent Lamps and Translucent Face



140.8(a)2 Maximum Allowed Lighting Power

Externally illuminated signs

- Allowed lighting power is the product of the illuminated face area and 2.3 watts/ft^2



140.8(b) Alternate Lighting Sources

Light sources will comply if meeting specific efficiency requirements:

- **High pressure sodium**
- **Metal halide (MH)**
  - Pulse start or ceramic MH with ballast efficiency ≥ 88%; or
  - Pulse start MH ≤ 320 watt with ballast efficiency ≥ 80% (Not including 175 watt or 250-watt MH lamps)
- **Neon or cold cathode**
  - Rated output current < 50 mA: power supply/transformer efficiency ≥ 75%; or
  - Rated output current ≥ 50 mA: power supply/transformer efficiency ≥ 68%

140.8(b) Alternate Lighting Sources Continued

Light sources will comply if meeting specific efficiency requirements:

- **Fluorescent lighting**
  - Use only lamps with CRI ≥ 80; or
  - Use electronic ballasts with output frequency ≥ 20 kHz
- **LED**
  - Power supply efficiency ≥ 80%
- **Compact Fluorescent**
  - Cannot contain medium screw base socket (E24/E26)

Additions and Alterations

141.0(b)2M Alterations to Existing Signs

Sign lighting alterations must meet power requirements of 140.8 when:

- Increasing connected lighting load; or
- Replace and rewire > 50% of ballasts; or
- Relocate sign to a different location on the same site or on a different site

Note

- Replacing ballasts or lamps alone does not trigger requirements
- There are no control requirements for sign lighting alterations
- New signs must meet power and control requirements

Resources

Online Resource Center

www.energy.ca.gov/orc

Handouts

- Fact sheets
- Guides

Tools

- Checklists
- Blueprint newsletter

Training

- Presentations
- Videos

Links

- Internal resources
- External resources

New Resource Hub

Homeowners and renters

- Information about water and space heating, cooking, EV charging, incentives

Contractors

- Information about training, tools, incentives

Local government representatives

- Information about model policies, permitting, training, incentives

Links on the Building and Home Energy Resource Hub

ATTCP Program - Lighting

ATTCP Program information

Lighting Controls

- National Lighting Contractors Association of America (NLCAA)
- California Advanced Lighting Controls Training Program (CALCTP)

National Lighting Contractors Association of America

California Advanced Lighting Controls Training Program

Blueprint Newsletter

Energy Code quarterly newsletter

- Updates
- Clarifications
- Frequently asked questions

Issue 138 | April - June 2022

BLUEPRINT

CALIFORNIA ENERGY COMMISSION

EFFICIENCY DIVISION

IN THIS ISSUE

- 2022 Energy Code: Multifamily Summary
- 2022 Energy Code: Compliance Software
- 2019 Energy Code: HERS Verifications
- Q&A
  - Solar PV for Multifamily Buildings
  - Multifamily Water Heating
  - Multifamily Common Use Areas

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

2022 Energy Code: Multifamily Summary

The 2022 Building Energy Efficiency Standards (Energy Code) reorganizes low-rise (three or fewer habitable stories) and high-rise (four or more habitable stories) multifamily buildings into one building type, updates the multifamily buildings definition in § 100.1, and moves all requirements for multifamily buildings to §§ 160.0-180.4. This and other significant changes include:

Mandatory Requirements

- Updates minimum efficiencies for HVAC equipment; adds minimum efficiency requirements for dedicated outdoor air systems (DOAS), heat pump, and heat recovery chiller packages. § 110.2
- Changes demand responsive lighting controls trigger to 4,000 watts or more; adds requirements for controlled receptacles. §§ 110.12, 160.5(b)4E
- Unifies envelope insulation, vapor retarder, and fenestration requirements. § 160.1
- For dwelling units
  - Adds requirements for central fan integrated ventilation systems requiring a motorized controlled damper, damper controls, and variable ventilation. § 160.2(b)2Aii
  - Requires vented kitchen range hoods ventilation rates or capture efficiencies based on conditioned floor area and fuel type per Tables 160.2-E, F, G. § 160.2(b)2Avic2
  - Requires a HERS-verified maximum fan efficacy of 1.0 Watts per cfm for heat recovery ventilation (HRV) and energy recovery ventilation (ERV) systems. § 160.2(b)2Biii
  - Adds mechanical acceptance testing requirements. § 160.3(d)2
  - Adds electric-ready requirements when gas equipment is installed for space heating, cooking, and clothes dryers. § 160.9(a-c)

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Receive Energy Code updates

- Subscribe to Efficiency Division emails
  - Appliances
  - Blueprint
  - Building Standards
- Respond to confirmation email

Follow the California Energy Commission

Energy Code Hotline

Monday through Friday

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

Call

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

Email

- Title24@energy.ca.gov

Energy Code Ace

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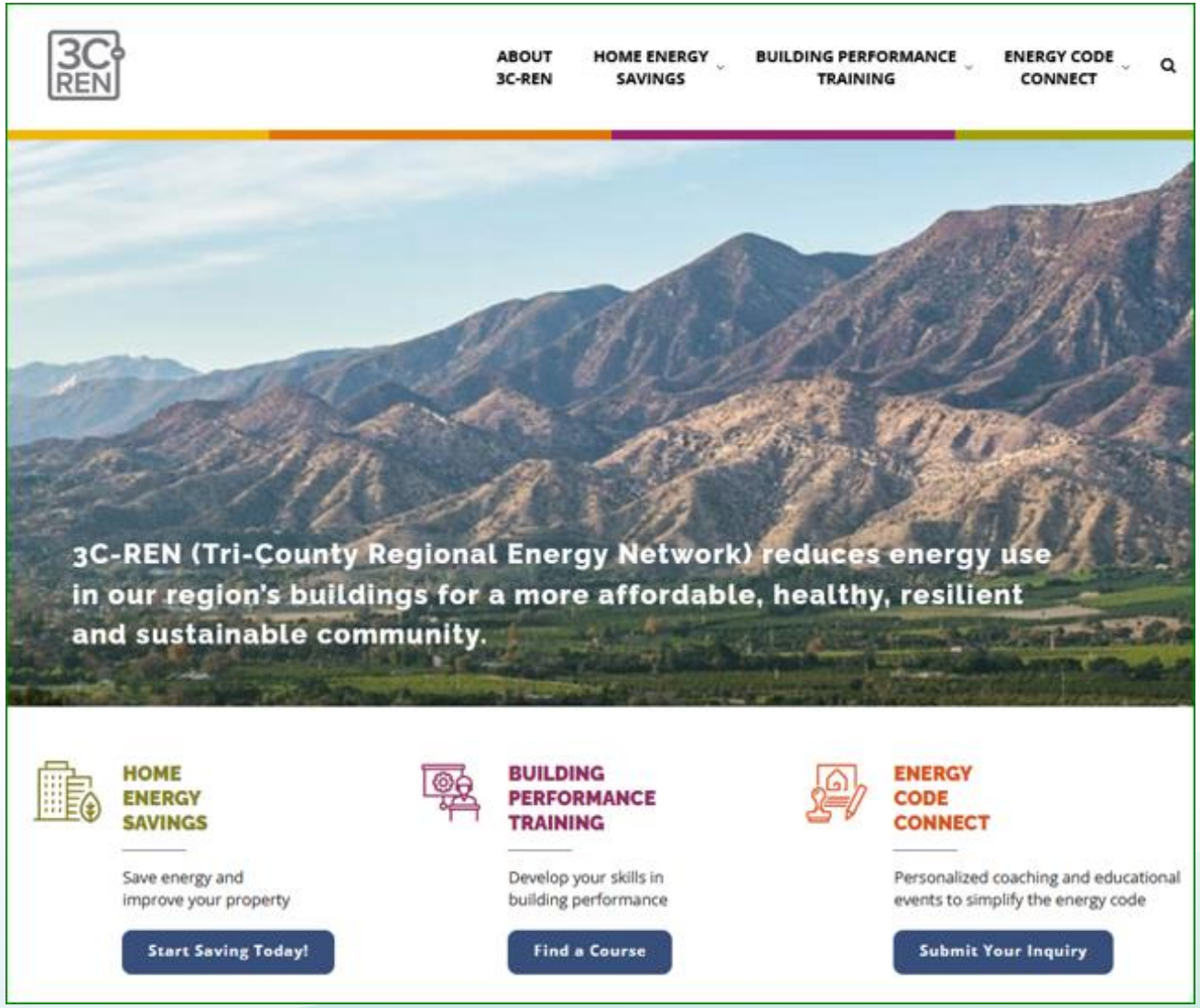
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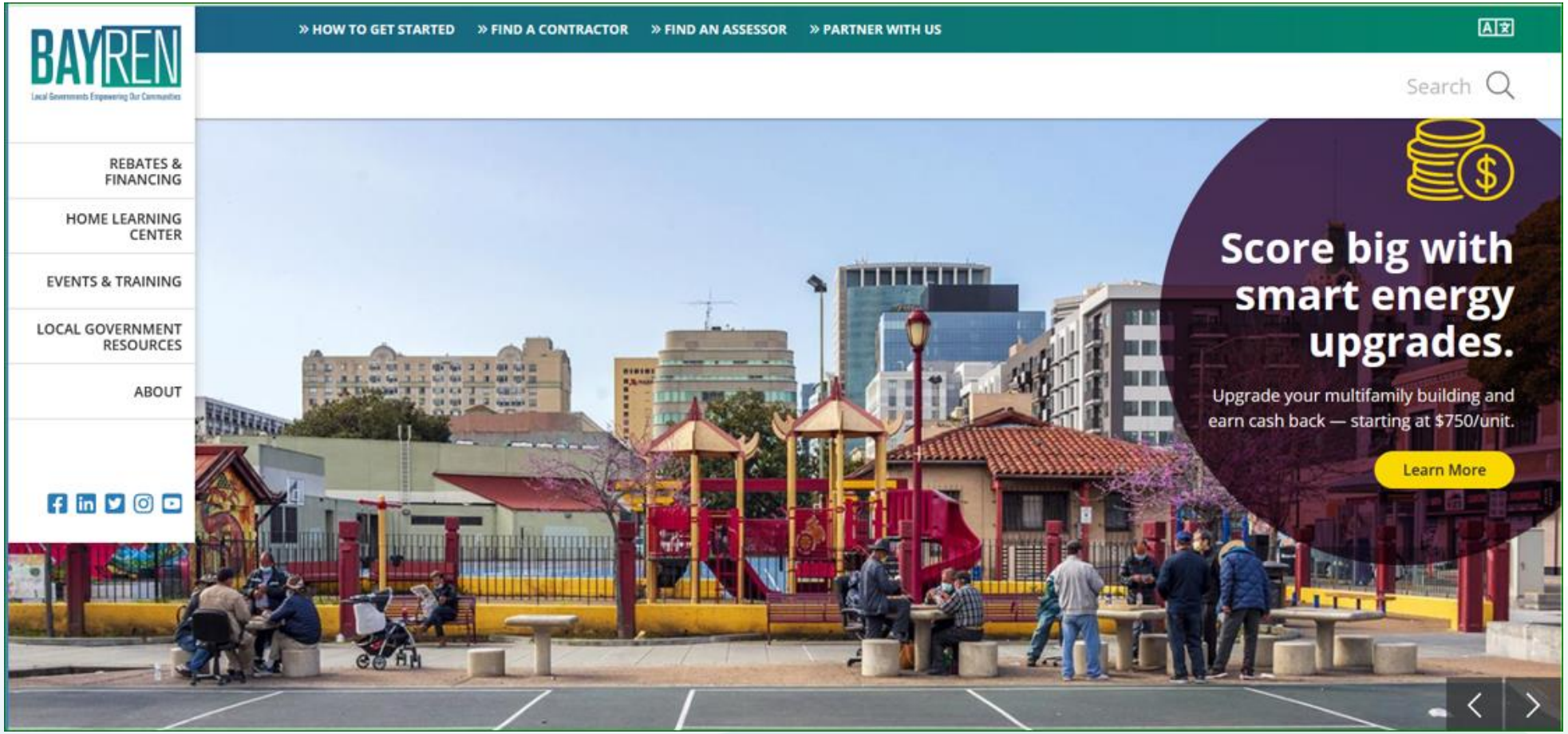
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Codes and Standards

Training and Education Program

- Free ICC-approved training sessions for 2022 Energy Code (Title 24, Part 6) requirements → www.iren.gov/161/CS-Trainings
- Requested training courses can also be scheduled

C&S Technical Support Program

Request Free Technical Assistance from Local Code Experts—Reach Code Development, Permit Guides, Etc. → www.iren.gov/162/CS-Technical-Support

Ask a Code Mentor an Energy Code Question

Submit queries online and receive a personalized response addressed by energy code experts within two business days! → www.iren.gov/162/CS-Technical-Support

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