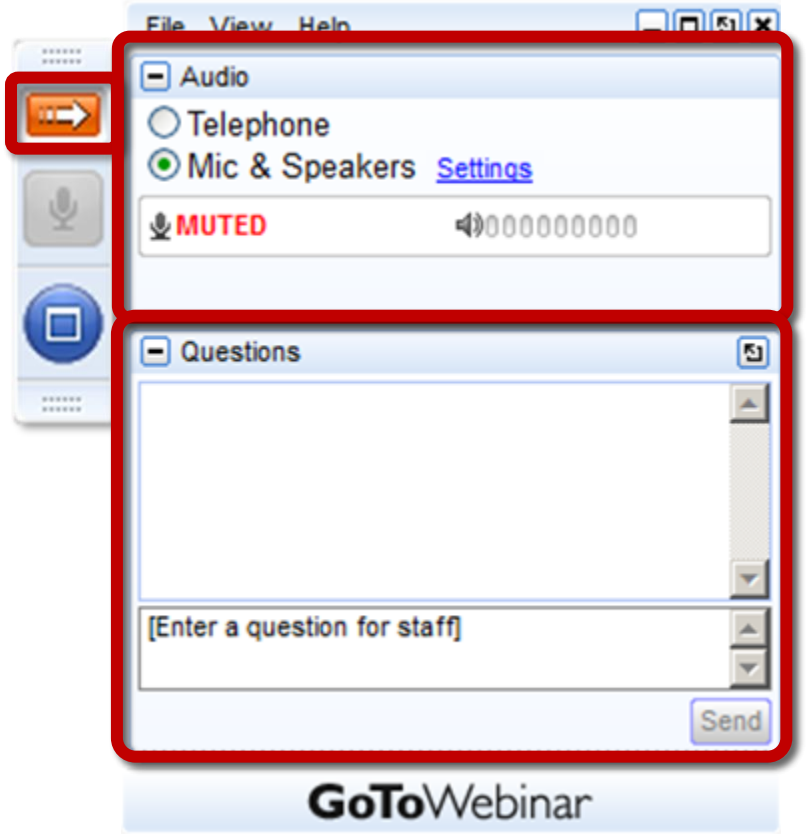
State Leadership in Clean Energy AWARDS

State Leadership in Decarbonizing the Building Sector, featuring California and New York

October 26, 2022

Clean Energy States Alliance

Webinar Logistics



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Clean Energy States Alliance

State of California Energy Commission

Connecticut Green Bank

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IPA Illinois Power Agency

Governor's Energy Office

Maryland Energy Administration

Massachusetts Clean Energy Center

EGLE Michigan Department of Environment, Great Lakes, and Energy

mn Commerce Department

State of New Hampshire Department of Energy

New Jersey's cleanenergy program njcleanenergy.com

New Mexico emnrd Energy, Minerals and Natural Resources Department

NYSERDA

State of Rhode Island Office of Energy Resources

SMUD Powering forward. Together.

Vermont Department of Public Service Clean Energy Development Fund

Virginia Energy

Washington State Department of Commerce

OEI Wisconsin Office of Energy Innovation

Connecticut Energy Environment

Illinois Commerce Commission ICC

Inclusive Prosperity Capital

DOER Massachusetts Department of Energy Resources

MassDEP

NREL National Renewable Energy Laboratory

Commissioner Stephanie Garcia Richard New Mexico State Land Office

OPC-DC Office of the People's Counsel Advocacy | Education | Protection

Oregon Department of Energy

Prairie Island Indian Community in the State of Minnesota

Rhode Island Commerce Corporation

Smart Electric Power Alliance

The 2022 State Leadership in Clean Energy Award Winners

STATE OF CALIFORNIA ENERGY COMMISSION

CONNECTICUT GREEN BANK SM

Maryland Energy Administration

NYSERDA

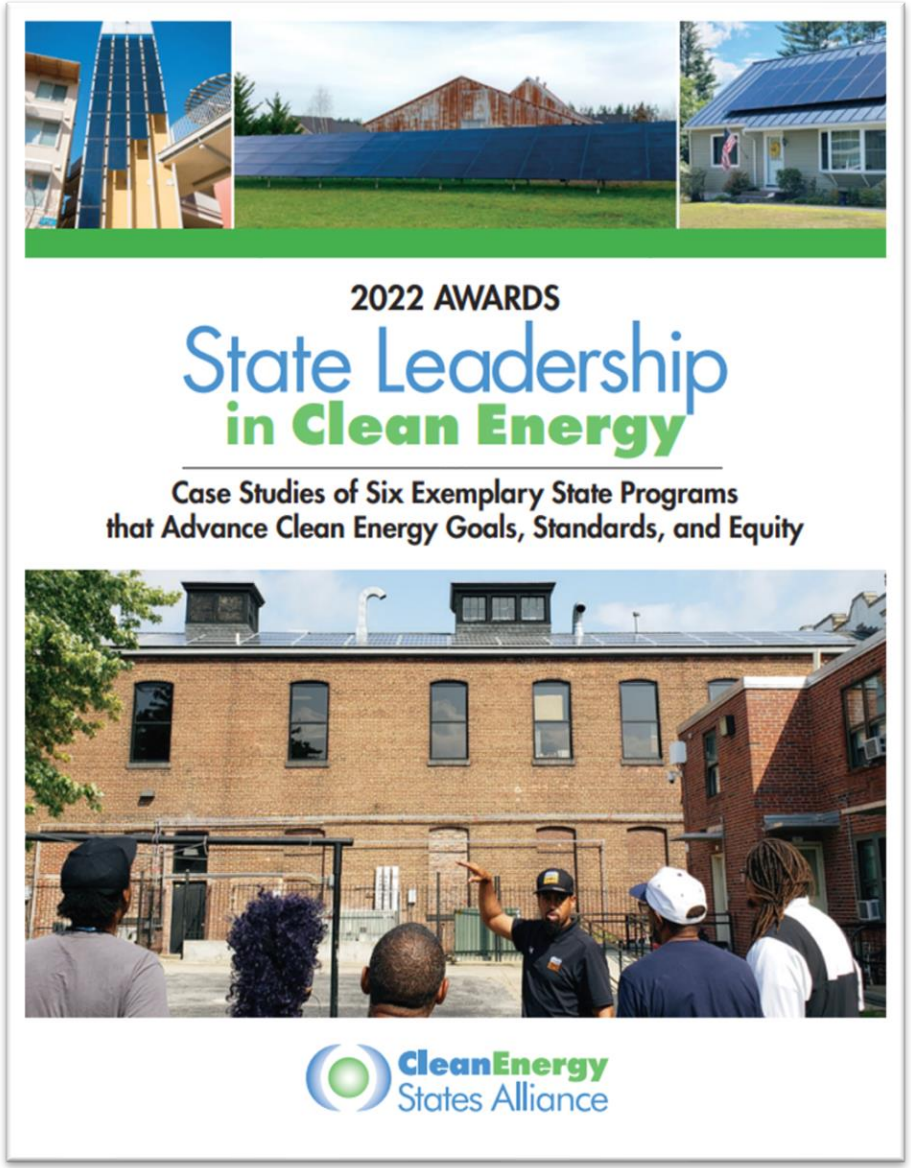
OREGON DEPARTMENT OF ENERGY

Washington State Department of Commerce

2022 State Leadership in Clean Energy Awards

- California Energy Commission's **2022 Building Energy Efficiency Standards**
- Connecticut Green Bank's **Green Liberty Bonds**
- Maryland Energy Administration's **Resilient Maryland / Resiliency Hubs Grant Program**
- New York State Energy Research and Development Authority (NYSERDA) and New York State Homes and Community Renewal's **Clean Energy Initiative**
- Oregon Department of Energy's **Oregon Solar+Storage Rebate Program**
- Washington Department of Commerce – Energy Office's **2021 State Energy Strategy**

Read case studies on the 2022 award winners at
www.cesa.org/resource-library/resource/2022-slice-awards-report/



Webinar Panelists

Samantha Pearce
Vice President of Sustainability, New York State Homes and Community Renewal

James Mannarino
Senior Project Manager, NYSERDA

Will Vicent
Manager, Building Standards Branch, California Energy Commission

Warren Leon
Executive Director, Clean Energy States Alliance (moderator)

New York State's Clean Energy Initiative: Collaborating for greener affordable housing

Samantha Pearce, VP Sustainability - OHP
NYS Homes & Community Renewal

James Mannarino, Senior Project Manager
NYS Energy, Research & Development Authority

New York State Energy Research and Development Authority (NYSERDA)

NYSERDA has been developing partnerships and programs to advance innovative energy solutions in New York State since 1975.

- Provide objective information and analysis, innovative programs, technical expertise, and support to help New Yorkers increase energy efficiency, save money, use renewable energy, and reduce reliance on fossil fuels.
- Protect the environment and create clean energy jobs.

New York's Climate Act

now

CLEAN ENERGY ECONOMY
over 157,000 clean energy jobs

More than 200,000 new jobs added

by 2025

RENEWABLE ENERGY
6,000 MW of distributed solar

10,000 MW of distributed solar*

RESILIENT and DISTRIBUTED GRID
1,500 MW of energy storage

ENERGY EFFICIENCY AND BUILDING DECARBONIZATION
185 TBtu end-use savings in buildings and industrial facilities

by 2030

RENEWABLE ENERGY/ CLEAN ENERGY STANDARD
70% electricity from renewable energy

GHG REDUCTION
40% reduction in greenhouse gas emissions from 1990 levels

6,000 MW of energy storage

1 million electric homes and 1 million electrification-ready homes

by 2035

RENEWABLE ENERGY
9,000 MW of offshore wind

CLEAN TRANSPORTATION
100% light duty zero-emission vehicle sales

by 2040

CLEAN ELECTRICITY
100% zero-emission electricity

by 2050

GHG REDUCTION
85% reduction in greenhouse gas emissions from 1990 levels

As announced by Governor Hochul during Climate Week 2021, New York State has now set a successor distributed solar goal of at least 10 GW of solar by 2030; NYSERDA and DPS Staff are now in the process of charting the path to 10 GW and beyond via a Whitepaper before the Public Service Commission (PSC).

Climate Act requires minimum 35%, with **goal of 40% of clean energy spending directed to disadvantaged communities**.

Two Million Climate-Friendly Homes by 2030

Governor Hochul's 2022 State of the State (SOTS)

- Directs NYSERDA, HCR, DPS and DOS to deliver:
  - **an executable plan this year** to reach 2 Million climate-friendly dwelling units **by 2030**
  - **a funding proposal** and **strategies to leverage private capital**
- The Action Plan must outline path and funding to achieve:
  - a minimum of **1 million electrified** homes/apartments
  - up to **1 million electrification-ready** homes/apartments
  - Ensure more than **800,000 (40%) low-to-moderate income households** served with clean energy upgrades

Scale of homes adopting full-load heat pump systems for heating and cooling will need to
Increase 10X from ~20k homes/year to 200k+ homes/year by 2030

Transformative Partnerships with Affordable Housing

- NYSERDA has robust partnerships in place with HCR, HPD and NYCHA to help them achieve their ambitious sustainability goals
- NYSERDA and HCR have a transformative long-term partnership to effectuate HCR's sustainability leadership and make decarbonization core to developing and preserving NYS affordable housing
- NYSERDA investment in HCR: $100M over 5 years
  - *Clean Energy Initiative*: a flagship effort to create a streamlined, scalable model for integrating rate-payer funding in the form of incentives and technical assistance into affordable housing financing process

Incentive Delivery Model

Creating a scalable model to integrate rate-payer funds into affordable housing agencies' financing processes

- NYSERDA incentives are accessed and disbursed using existing agencies' (e.g., HCR) project intake and financing processes.
- No separate administrative processes for/interaction with NYSERDA from project developer's perspective.
- NYSERDA and Technical Assistance contractors provide "background" oversight and QA/QC alongside housing agencies.

New York State Homes and Community Renewal

The State's affordable housing agency, with **a mission to build, preserve, and protect affordable housing and increase homeownership (single-family) throughout New York State.**

HCR is comprised of the following agencies:

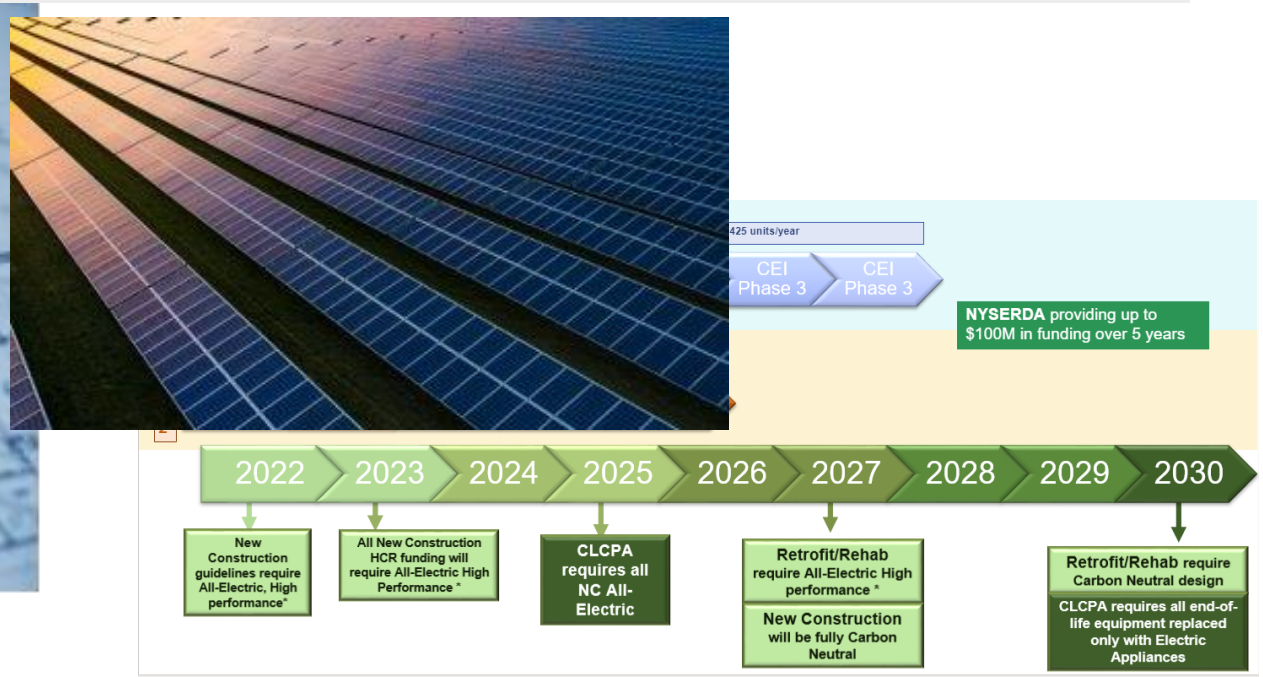
- The State of New York Mortgage Agency (SONYMA)
- Housing Finance Agency (HFA)
- Housing Trust Fund Corporation (HTFC)
- Affordable Housing Corporation (AHC), and
- Division of Housing and Community Renewal (DHCR)

NEW YORK STATE OF OPPORTUNITY. | Homes and Community Renewal

NYSERDA & HCR Partnership

Five Key Work Areas

- **Capacity Building**: Create a process for NYSERDA/Energy funding to be utilized as a source (aka directly injected) into HCR pipeline
- **Technical Support**: Provide TAP support for both new construction and existing buildings (preservation and adaptive reuse)
- **Process**: Roll out a set of Guidelines for Sustainability within HCR
- **Data & Research**: Create a process for carbon accounting with HCR. Support HCR with research and developments of new decarbonized technologies.
- **Strategy:** Ensure the HCR roadmap is aligned with the State's Carbon Reduction goals as defined in the CLCPA and 2 Million Homes Action Plan



Sustainability Guidelines

HCR SUSTAINABILITY GUIDELINES:
NEW CONSTRUCTION

HCR.NY.GOV
SPRING 2022

SECTION 1
CORE SUSTAINABILITY REQUIREMENTS

Section 1 of the New Construction Sustainability Guidelines outlines core project requirements and eligible third-party certification programs that must be met by all projects.

At a minimum, projects must meet the all-electric standard and comply with one of the **Baseline Requirement** third-party certifications. Projects are encouraged to select a third-party certification from the **Stretch Goal** section, while still meeting the all-electric standard. Projects that commit to compliance with criteria listed in the **Stretch Goals** in Section 1 of these Guidelines shall be considered automatically in compliance with Section 2 and can skip directly to Section 3 of these Guidelines.

GENERAL CONSIDERATIONS

Code compliance takes precedence for all building systems and design. If a conflict exists between building/energy codes or HCR sustainability requirements, a design waiver should be requested from HCR.

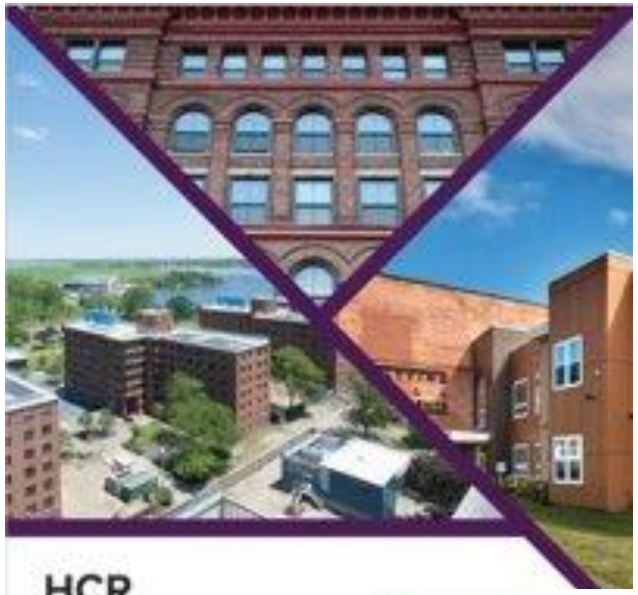
Please be advised that energy code requirements and the corresponding energy efficiency strategy must be considered when planning a Project's development schedule. Projects will be responsible, without any additional cost to HCR programs, to comply with the applicable energy efficiency standard and all energy code requirements.

Nonresidential projects, or nonresidential spaces in a mixed-use project, shall incorporate comparable energy efficiency strategies as those required for residential projects to achieve similar energy savings.

Baseline Requirements

A. **All Electric**: All projects must utilize high-performance all-electric heating/cooling and domestic hot water equipment and other in-unit or shared appliances such as dryers and cooktops, ovens or ranges, and;

Ulico Crescent, Brooklyn, NY



HCR SUSTAINABILITY GUIDELINES:
EXISTING BUILDING

HCR.NY.GOV
SPRING 2022

STRUCTURE
SUSTAINABILITY GUIDELINE REQUIREMENTS

This booklet is divided into three sections:

Section 1: Core Sustainability Requirements

Section 2: Building Performance Requirements

Section 3: Additional Sustainability Requirements

Adaptive Reuse	Substantial Rehab	Moderate Rehab Level II	Moderate Rehab Level I
No IPNA Required	*No IPNA Required*	*IPNA Required*	*IPNA Required*
Baseline: • All-electric • Choose from NYSERDA NC-H, 2020 EGC, LEED v4.1, Well or National Green Building Standard	**Baseline:** • 20% energy reduction in project • Choose from 2020 EGC or LEED v4.1	**Baseline:** • IPNA • 20% energy reduction in project	**Baseline:** • IPNA • Retro-commission central plant systems • Mandatory water and lighting efficiency (Section 2) • Insulate existing DHW and HVAC
Stretch: • LEED v4.1 BD&C Zero • 2020 EGS Plus • Passive House	**Stretch:** • Passive House envelope • Electrification • 2020 EGC Plus or EnerPHit	**Stretch:** • Passive House envelope • Electrification • 2020 EGC Plus or EnerPHit	**Stretch:** • 20% energy reduction • Path to electrification • Electric ready

Overview: NYS Clean Energy Initiative (CEI)

On August 2021, NYS Homes and Community Renewal (HCR) and the NYS Energy Research and Development Authority (NYSERDA) announced the availability of state funding for a new Clean Energy Initiative, designed to create energy-efficient, all-electric affordable housing units.

1. Promote ease of access to affordable housing owners/developers through one application and source
2. Minimize issues with incentive-based payments
3. Inject clean energy funding within the capital stack

Overview NYS CEI: Program Development

Phase	New Construction	Adaptive Reuse	Existing Buildings
Funding	$5,500/unit, *Max awards: $1.375M* NC Boost: $7,500/Unit, *Max awards: $1.5M*	Adaptive Reuse: $12,500/unit *Max Award: $2.5M**	If all three eligible scopes are selected: $25,000/unit *Max Award: $5.625M**
Eligible Projects	Meets ONE of the Stretch goals in Section 1 of the Sustainability Guidelines *(LEED BD+C Gold AND LEED Zero, PHI/PHIUS Certification, OR EGC+)*	Meets one of the stretch goals in Section 1 of the Sustainability Guidelines *(LEED BD+C Gold AND LEED Zero, PHI/PHIUS Certification, OR EGC+)*	Selects at least one of the eligible scope item: 1. Electrification of space heating 2. Electrification of DHW systems 3. Building Envelope & ventilation
Notes	Boost Eligibility: 1. <60 units AND >4 stories 2. Project team has not certified a passive at time of application 3. >20 stories above grade 4. Total energy cost is less than $1,000/unit (modeled)	If SHPO designation, an Adaptive Reuse may follow the Existing Building term sheet, with a waiver, for funding and scope	*Details of each scope criteria on the next slide*
Requirements	All projects must pay into SBC (Systems Benefit Charge) through their local utility Cannot receive NYSERDA MPP, NC-H, or BOE funding for construction, Existing Buildings may not receive utility AMEEP funds when accepting CEI funds *All CEI funding includes eligible amount of UP TO $1,000/unit for soft cost, as part of max award*		

Overview NYS CEI: Existing Buildings

Phase	Goal 1: Electrification of Heating System	Goal 2: Electrification of DHW system	Goal 3: Building Envelope Improvement & Ventilation
Funding	**$8,500/unit max**	**$4,000/unit max**	**$12,500/unit max**
Scope of Work	Replace existing fossil-fuel (e.g., gas, oil, propane fired) based heating equipment or electric resistance baseboard systems with high-efficiency, all-electric heat pumps	Replace existing domestic hot water systems with high performance all-electric heat pump system	**Envelope:** Pursue Envelope Stretch Goals listed in Section 2 of the Existing Building Sustainability Guidelines (p23-24) **Ventilation:** Pursue Ventilation Stretch Goals listed in Section 2 of the Existing Building Sustainability Guidelines (p31)
Requirements	Required Building Envelope Conditions •A high-performance envelope is required when electrification of heating is being pursued.	Equipment must comply with the Adaptive Reuse Baseline Requirements for Domestic Hot Water equipment listed in Section 2 of the Existing Building Sustainability Guidelines (p 30	• Envelope improvements that contribute to an overall building envelope that is at least 15% more energy efficient than 2020 ECC • Implementation of an engineered natural ventilation system in compliance with ASHRAE 62.1 Section 6.4 Natural Ventilation Procedure • Existing buildings with natural ventilation systems installing through-wall exhaust fans in kitchen and bathrooms • Installation of energy recovery ventilator (ERV) or heat recovery ventilator (HRV) equipment

Role of Technical Assistance Providers (TAP)

We heard from the market, navigating the technical space of heat pump type selection, certification process with green energy performance programs, and the integrated design process can be confusing, especially for first time decarbonization teams.

- Provide direct support for Clean Energy work scope items
- Expertise in Passive House and high-performance building standards
- Compliance with the CEI Program

Project Example: Tailor Square—Adaptive Reuse of Hickey Freeman

- Green Building and Energy Incentives and Funding:
  - CEI—$1.675 million
  - RGE—$695,800
  - Solar Credits/Geothermal/NYSERDA—$230,000
  - LIHTC—30% of Cost
  - Federal Historic Tax Credits —15% of Cost
  - State Historic Tax Credit — 5% of Cost
- Economic Development Goals:
  - $84 Million Total Investment
  - 77,000 sq ft Manufacturing
  - 250 Jobs Preserved

Questions

Thank you

Samantha Pearce, VP Sustainability - OHP
NYS Homes & Community Renewal

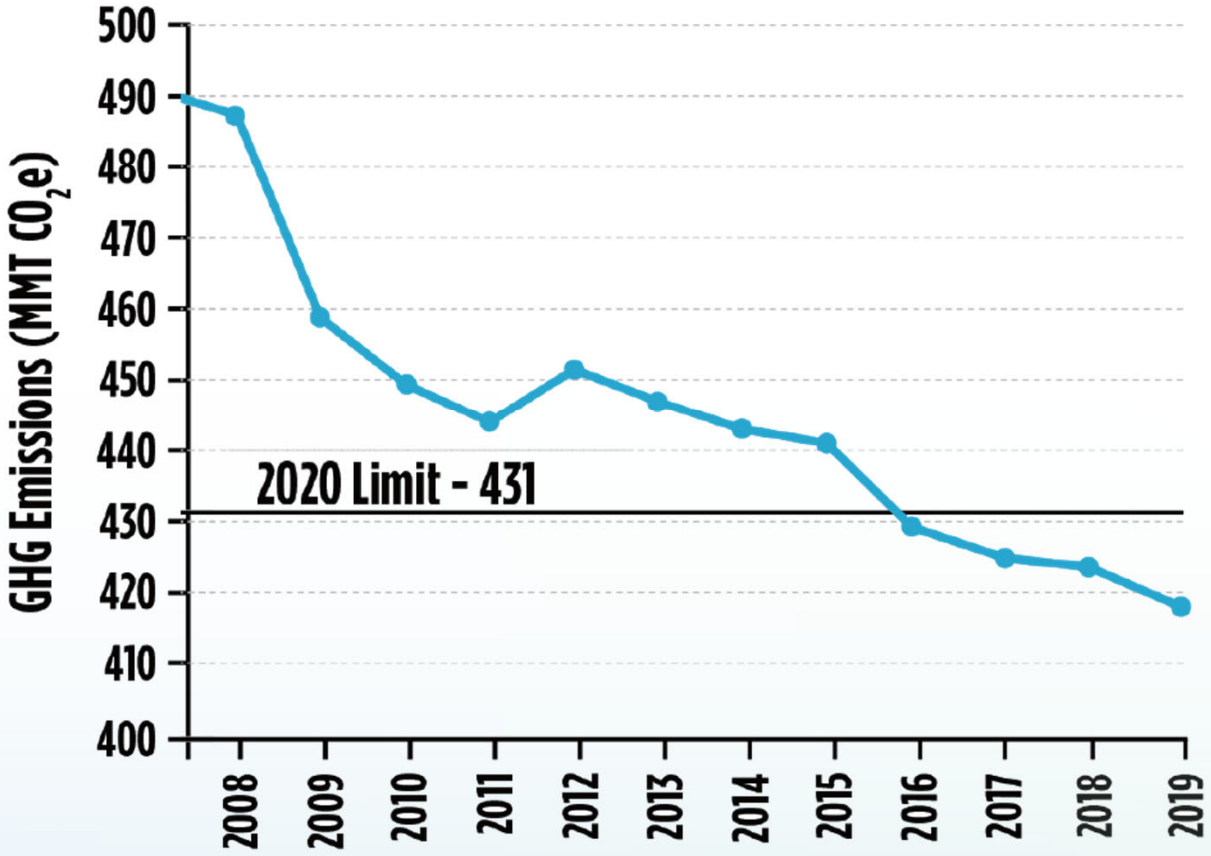
James Mannarino, Senior Project Manager
NYS Energy, Research & Development Authority

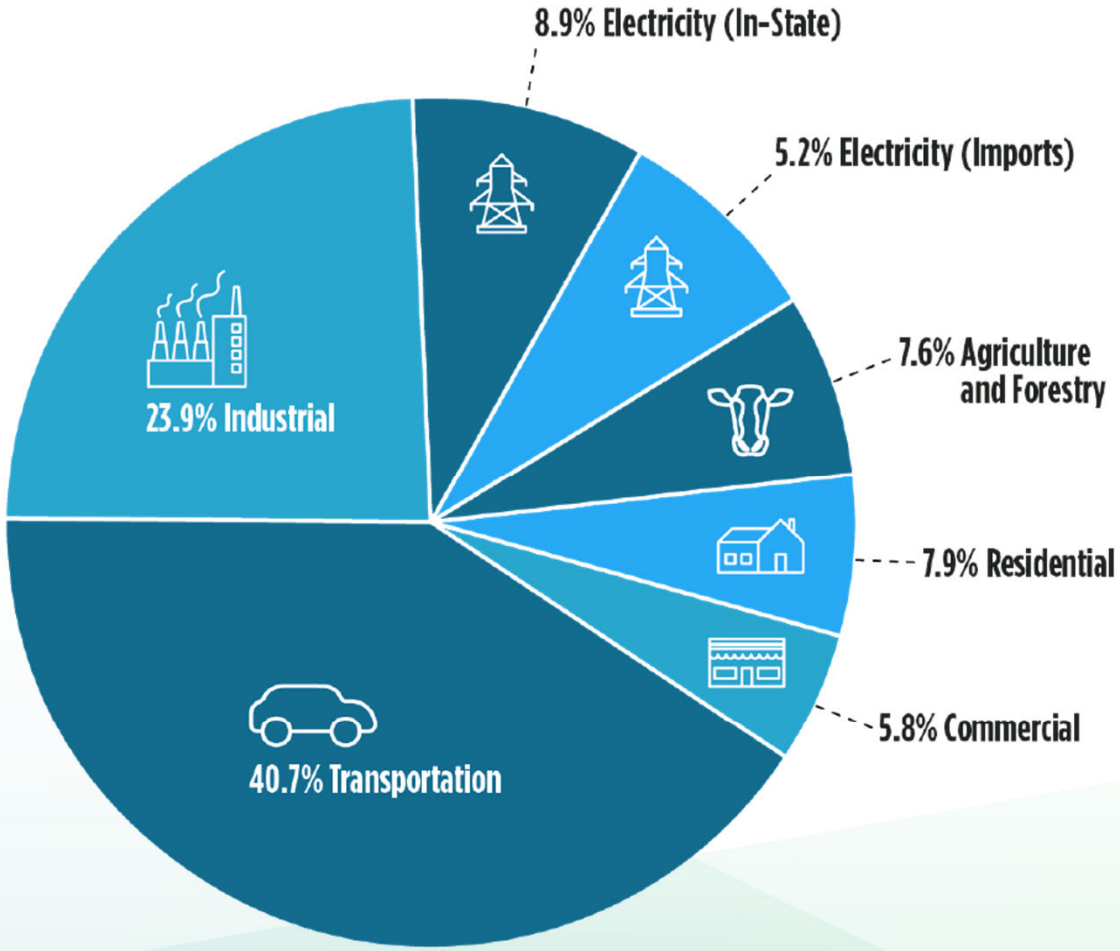
State Leadership in Building Decarbonization

October 26, 2022 – Hosted by Clean Energy States Alliance

Will Vicent, Manager, Building Standards Branch
California Energy Commission

California Greenhouse Gas Emissions



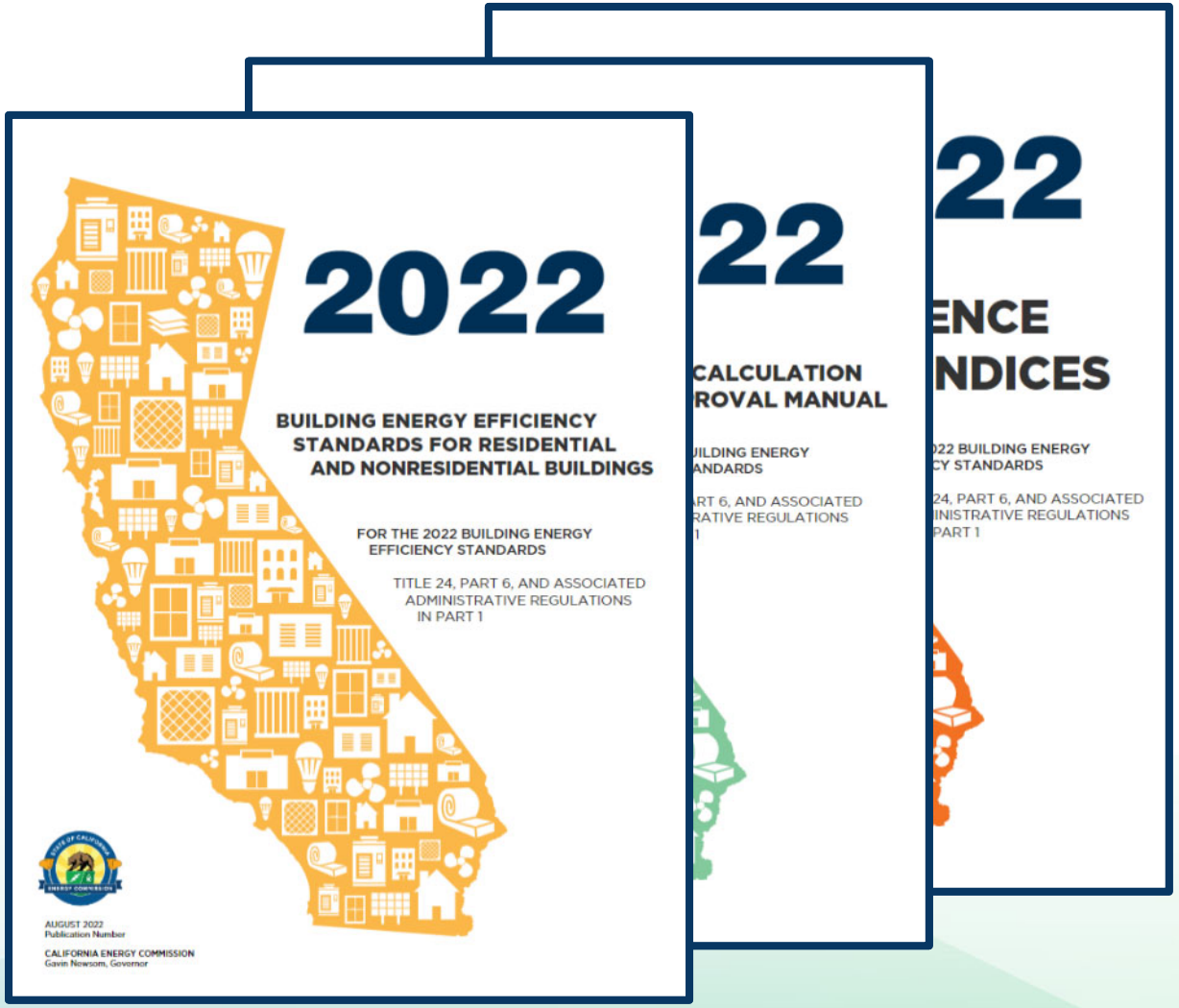


Energy Code

- Warren-Alquist Act established the California Energy Commission (CEC) in 1974
- Authorizes CEC to update the Energy Code regularly and local jurisdictions to enforce
- CA uses 31% less energy than US
- Must be cost-effective and feasible
- Least-cost means to achieve CA's climate actions goals

2022 Energy Code Highlights

- Envelope + lighting
- Heat pump baselines
- Electric-ready requirements
- Solar + storage baselines
- Ventilation requirements



Heat Pumps

<u>Electric water and space heating</u>

- Increases efficiency
- Reduces GHGs
- Encourages load flexibility

<u>2022 Energy Code</u>

- Single-family: water or space heating standard
- Multifamily: space heating standard
- Commercial: standards for schools, offices, banks, libraries, retail, grocery

Residential Electric-Ready

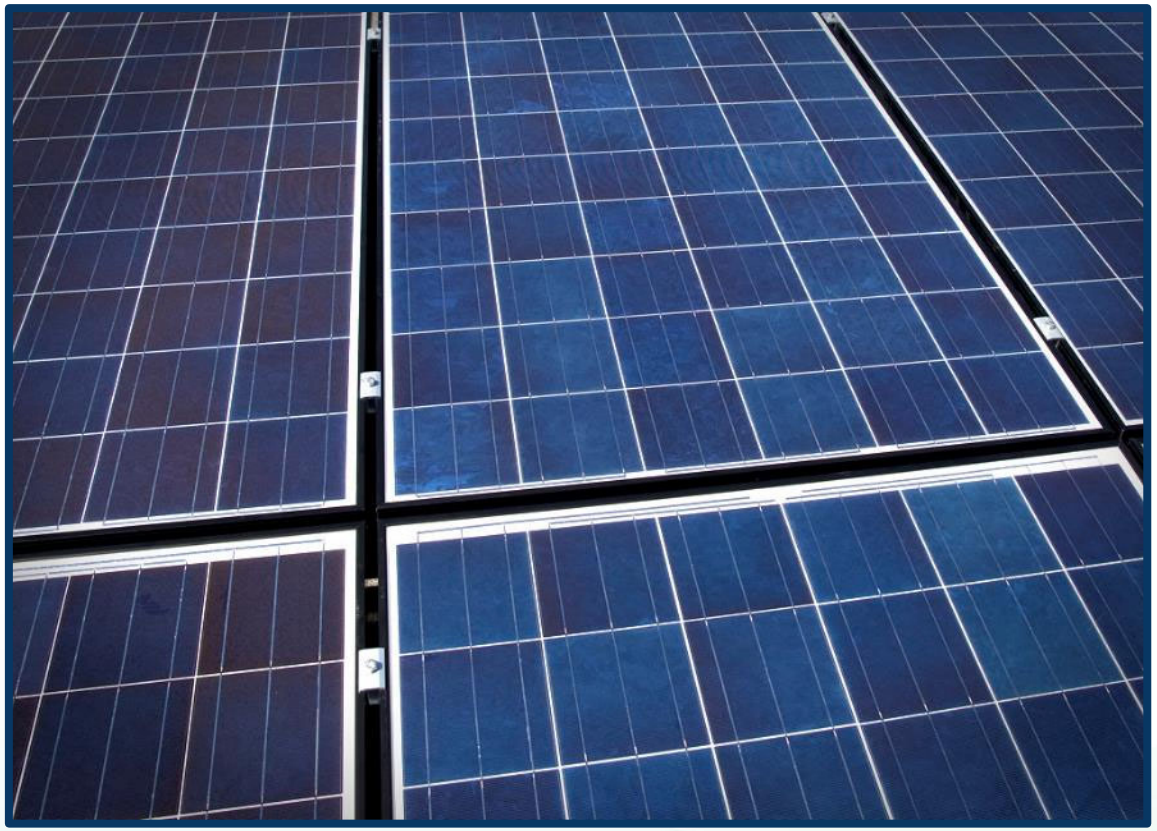
- Dedicated electrical circuits for single-family and multifamily: space heating, cooking, clothes drying & water heating
- Energy storage system-ready requirements for single-family, including minimum electric panel busbar rating of 225 amps

Solar Energy & Battery Storage

<u>2022 solar + battery standards</u>

- High-rise multifamily
- Hotel/motel
- Office, medical/clinic
- Retail, grocery
- Restaurant
- School, library, civic spaces

- Solar + battery sized modestly



30-Year Environmental Benefit

2022 Measure Categories	% Total	Emissions Savings (MTCO2e)	Emissions Benefit ($)
Single Family Heat Pump Standard	5.38%	729,698	$115,564,424
Multifamily Heat Pump Standard	0.49%	71,639	$11,345,665
Nonresidential Heat Pump Standard	1.50%	214,917	$34,036,994
Multifamily PV + Battery	2.32%	202,702	$32,102,422
Nonresidential PV + Battery	10.04%	876,231	$138,771,230
Multifamily Energy Efficiency	0.82%	89,215	$14,129,309
Nonresidential Energy Efficiency	8.03%	768,793	$121,755,977
Nonresidential Alterations	34.65%	3,435,740	$544,127,893
Single Family Alterations	10.86%	977,604	$154,825,984
Covered Processes	25.92%	2,480,724	$392,879,357
Totals	**100%**	**9,847,264**	**$1,559,539,255**

2022 Adoption Accolades

"In putting together the 2022 Energy Code, the commission managed to thread the needle of legal authority, market readiness and customer choice, and come out the other end with…the strongest state decarbonization code in the country."

- Panama Bartholomy, Building Decarbonization Coalition

"Buildings with solar and storage will provide Californians with cleaner and greener living and working spaces. The rules will significantly contribute to improved grid reliability and local resilience, which is a key part of our clean energy transformation."

- Evelyn Butler, Solar Energy Industries Association

"With this policy, the world's fifth largest economy is pivoting to climate-friendly and cleaner buildings that cost less to build and to operate than fossil fuel alternatives, setting a model for the international community."

- Pierre Delforge, National Resource Defense Council

Cost-Effectiveness

Cost-Effectiveness – 2,100 ft² Prototype Heat Pump Space Heating

Climate Zone	Benefits TDV Energy Cost Savings[1] (2023 PV $)	Costs Total Incremental Present Value (PV) Costs[2] (2023 PV $)	Benefit-to-Cost Ratio
1	$1,904	$200	9.5
2	$2,191	$200	11.0
3	$1,497	$200	7.5
4	$1,235	$200	6.2
5	$120	$200	0.6
6	$378	$200	1.9
7	$291	$200	1.5
8	$113	$200	0.6
9	$269	$200	1.3
10	$392	$200	2.0
11	$2,133	$200	10.7
12	$2,060	$200	10.3
13	$1,206	$200	6.0
14	$530	$200	2.7
15	$1,958	$200	9.8
16	$1,017	$200	5.1

Cost-Effectiveness – 2,100 ft² Prototype Heat Pump Water Heating

Climate Zone	Benefits TDV Energy Cost Savings[1] (2023 PV $)	Costs Total Incremental Present Value (PV) Costs[2] (2023 PV $)	Benefit-to-Cost Ratio
1	$418	$0	>1
2	$1,428	$0	>1
3	$1,500	$0	>1
4	$1,838	$0	>1
5	$1,355	$0	>1
6	$2,231	$0	>1
7	$2,329	$0	>1
8	$2,583	$0	>1
9	$2,500	$0	>1
10	$2,430	$0	>1
11	$1,602	$0	>1
12	$1,540	$0	>1
13	$2,024	$0	>1
14	$1,348	$0	>1
15	$2,550	$0	>1
16	$752	$771	1.0

Flexibility

CBECC Title-24 Compliance Software

HOME | CBECC 2022 | CBECC-COM 2019 | SUBMIT AN ISSUE / FAQ | REFERENCE METHOD | RESOURCES | SOFTWARE ARCHIVE

CBECC: California Building Energy Code Compliance (for Nonresidential and Multifamily buildings) software

CBECC (California Building Energy Code Compliance) is an open source project that may be used by Code Agencies, Rating Authorities, or Utility Programs in the development of energy codes, standards, or efficiency programs. Architects, engineers, and energy consultants may also use these tools to demonstrate compliance with energy codes or beyond-code programs.

California Association of Building Energy Consultants

CABEC

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Certified Energy Analyst (CEA) Program

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CalBEM

California Building Energy Modeling

Process

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

CA Codes & Standards Network

Pacific Gas and Electric Company®

SOUTHERN CALIFORNIA EDISON®

SDGE A Sempra Energy utility

LA DWP Los Angeles Department of Water & Power

SMUD®

CBSC

HOUSING AND COMMUNITY DEVELOPMENT • CALIFORNIA •

PUBLIC UTILITIES COMMISSION • STATE OF CALIFORNIA • EUREKA

STATE OF CALIFORNIA ENERGY COMMISSION

CALIFORNIA AIR RESOURCES BOARD

DGS GENERAL SERVICES

CALIFORNIA DEPARTMENT OF FORESTRY & FIRE PROTECTION CAL FIRE SINCE 1885

DSA DIVISION OF THE STATE ARCHITECT DEPARTMENT OF GENERAL SERVICES

DEPARTMENT OF ENERGY • UNITED STATES OF AMERICA

CALIFORNIA BUILDING OFFICIALS

ICC INTERNATIONAL CODE COUNCIL®

BAYREN Local Governments Empowering Our Communities

Southern California REGIONAL ENERGY NETWORK

3C-REN

CALIFORNIA ENERGY CODES & STANDARDS

CalBEM

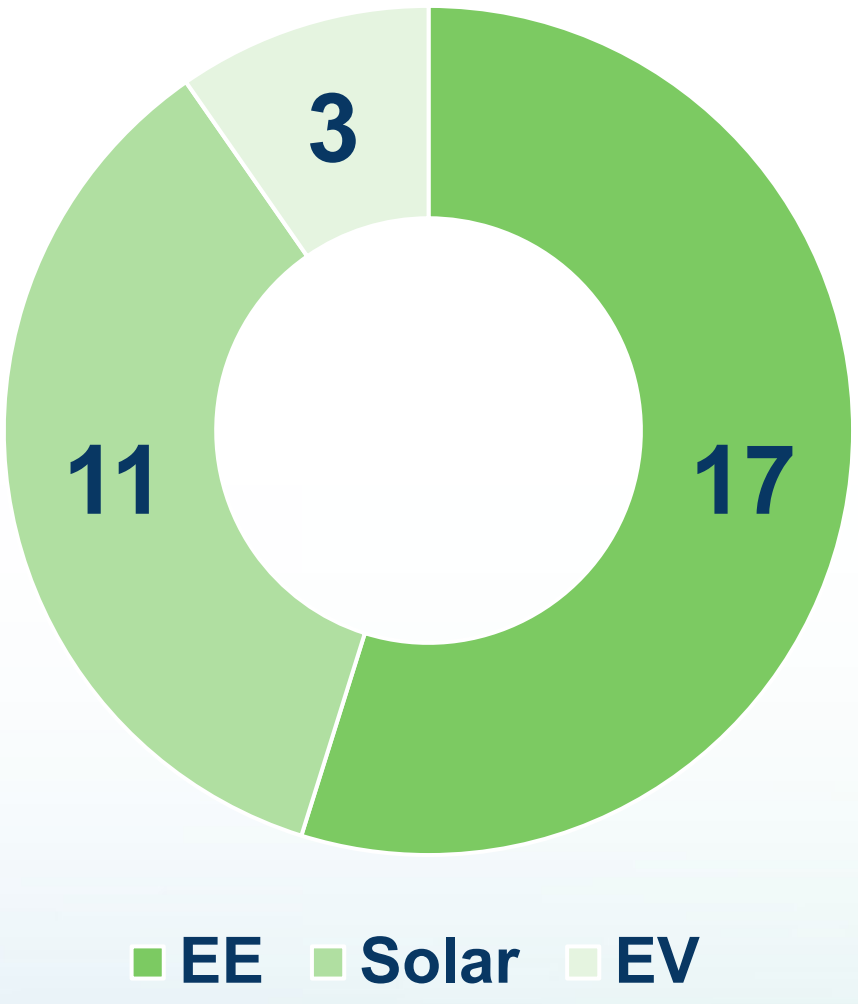
CABEC California Association of Building Energy Consultants

CALIFORNIA ENERGY CODES & STANDARDS A STATEWIDE UTILITY PROGRAM

EnergyCodeAce™ Comply With Me

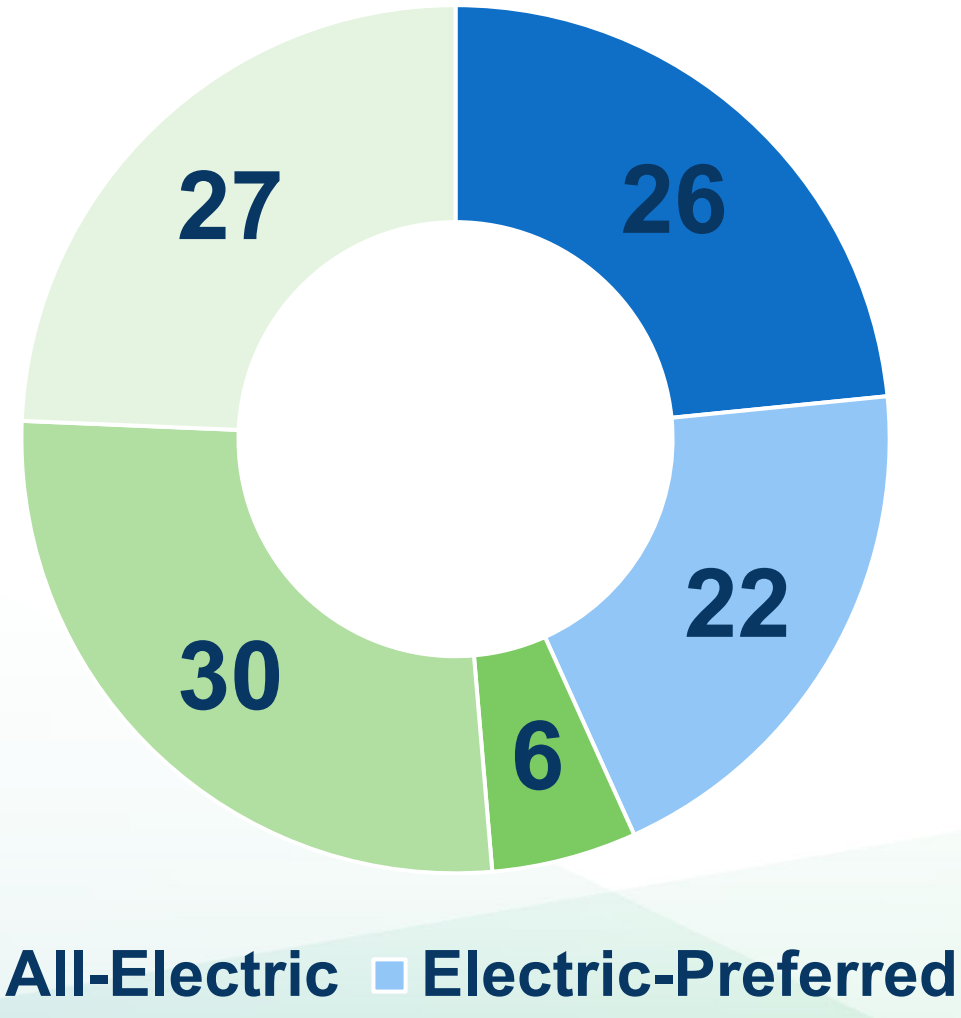
2016 Code Cycle

20 Adopted Reach Codes



2019 Code Cycle

50 Adopted Reach Codes



2025 Energy Code Timeline

Milestone	Dates (Subject to Change)
CEC Kickoff Workshop – Compliance Tools & Templates	March 22, 2022
Deadline to Submit New Measures (title24stakeholders.com)	April 15, 2022
Research Version of Energy Code Compliance Software	October 2022
Utility-Sponsored Workshops	August 2022 – April 2023
CEC Energy Code Accounting Workshop	November 10, 2022
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

Web Resources

- Energy Commission – 2025 Building Energy Efficiency Standards Webpage
- Energy Commission – 2022 Building Energy Efficiency Standards Webpage
- Energy Commission – Docket for 2022 Energy Code Update Rulemaking
- Energy Commission – Docket for 2022 Environmental Impact Report
- Energy Commission – Docket for 2022 Parts 11 (CALGreen) + 2-5 Rulemaking
- Energy Commission – Online Resource Center
- Title 24 Stakeholders – Get involved in the code change process and see past measure proposals.
- Energy Code Ace – One-stop shop for no-cost tools, training and resources to help you comply with the state's Energy Code and appliance standards.
- Local Energy Codes – Where cities, counties and stakeholders collaborate to drive reach code development and adoption for long-term climate and energy efficiency benefits.
- CalBEM – Statewide industry collective and annual event on building energy modeling (BEM), with goals to streamline & simplify processes, educate users, and improve capabilities & accuracy.

Thank you for attending our webinar

Warren Leon
Executive Director
Clean Energy States Alliance

Learn more about the 2022 State Leadership in Clean Energy Awards and read case studies of the winning programs at
www.cesa.org/projects/state-leadership-in-clean-energy/2022-awards/

Clean Energy States Alliance

Upcoming Webinars

- Innovative Avenues to Public Participation in Clean Energy Development, Featuring Connecticut and Washington (11/9)
- Resilient Solar+Storage for Cooling Centers (11/16)
- Behind-the-Meter Energy Storage: Comparing State Policies (11/17)
- Energy Storage in the Southwest: Battery Case Studies from Albuquerque Public Schools and the Navajo Tribal Utility Authority (12/1)
- State Leadership in Solar+Storage, Featuring Maryland and Oregon (12/9)

Read more and register at www.cesa.org/webinars