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

October 26, 2022
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The 2022 State Leadership in Clean Energy Award Winners
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**

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
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.
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
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.
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)
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**

**SECTION 1: CORE SUSTAINABILITY REQUIREMENTS**

Section 1 of the New Construction Sustainability Guidelines outlines core project requirements and addresses sustainability concerns that must be met by all projects.

- **General Considerations:**
  - New construction is required for all building systems and technologies. It is important to consider the potential impact of building systems on the environment.
  - Building systems should be designed to minimize energy and water usage, and to promote sustainability.
  - New construction should be designed to comply with all applicable sustainability requirements.

- **Building Systems:**
  - Building systems should be designed to minimize energy and water usage, and to promote sustainability.
  - Building systems should be designed to comply with all applicable sustainability requirements.

- **Energy Efficiency:**
  - Energy efficiency is a key consideration in the design of new construction.
  - Energy efficiency should be integrated into all aspects of the project.

- **Water Efficiency:**
  - Water efficiency is another important consideration in the design of new construction.
  - Water efficiency should be integrated into all aspects of the project.

- **Material Selection:**
  - Material selection is an important consideration in the design of new construction.
  - Material selection should be based on sustainability criteria.

- **Construction Practices:**
  - Construction practices should be designed to minimize environmental impact.
  - Construction practices should be designed to comply with all applicable sustainability requirements.

**HCR SUSTAINABILITY GUIDELINES: EXISTING BUILDING**

**SECTION 2: 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**

- **Baseline:** No IPNA Required
- **Stretch:** LEED v4.1 BD+C Zero
  - 2020 EGS Plus
  - Passive House

**Substantial Rehab**

- **Baseline:** No IPNA Required
- **Stretch:** LEED v4.1, WELL v1.0, or National Green Building Standard

**Moderate Rehab Level I**

- **Baseline:** IPNA Required
- **Stretch:** 20% energy reduction in project
  - Passive House
  - House Plus

**Moderate Rehab Level II**

- **Baseline:** IPNA Required
- **Stretch:** 20% energy reduction in project
  - Passive House
  - House Plus

**Additional Sustainability Requirements**

- **Baseline:** 20% energy reduction
- **Stretch:** Path to electrification
- **Electrical:** 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

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

<table>
<thead>
<tr>
<th>Phase</th>
<th>Goal 1: Electrification of Heating System</th>
<th>Goal 2: Electrification of DHW system</th>
<th>Goal 3: Building Envelope Improvement &amp; Ventilation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding</td>
<td>$8,500/unit max</td>
<td>$4,000/unit max</td>
<td>$12,500/unit max</td>
</tr>
<tr>
<td>Scope of Work</td>
<td>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</td>
<td>Replace existing domestic hot water systems with high performance all-electric heat pump system</td>
<td><strong>Envelope</strong>: Pursue Envelope Stretch Goals listed in Section 2 of the Existing Building Sustainability Guidelines (p23-24)  <strong>Ventilation</strong>: Pursue Ventilation Stretch Goals listed in Section 2 of the Existing Building Sustainability Guidelines (p31)</td>
</tr>
</tbody>
</table>
| 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:
  o CEI—$1.675 million
  o RGE—$695,800
  o Solar Credits/Geothermal/NYSERDA—$230,000
  o LIHTC—30% of Cost
  o Federal Historic Tax Credits —15% of Cost
  o State Historic Tax Credit — 5% of Cost

• Economic Development Goals:
  o $84 Million Total Investment
  o 77,000 sq ft Manufacturing
  o 250 Jobs Preserved
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
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

Electric water and space heating
- Increases efficiency
- Reduces GHGs
- Encourages load flexibility

2022 Energy Code
- 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
2022 solar + battery standards

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

- Solar + battery sized modestly
## 30-Year Environmental Benefit

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

<table>
<thead>
<tr>
<th>Climate Zone</th>
<th>Benefits TDV Energy Cost Savings¹ (2023 PV $)</th>
<th>Costs Total Incremental Present Value (PV) Costs² (2023 PV $)</th>
<th>Benefit-to-Cost Ratio</th>
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<td>$1,904</td>
<td>$200</td>
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<td>2</td>
<td>$2,191</td>
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<td>16</td>
<td>$1,017</td>
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### Cost-Effectiveness – 2,100 ft² Prototype Heat Pump Water Heating

<table>
<thead>
<tr>
<th>Climate Zone</th>
<th>Benefits TDV Energy Cost Savings¹ (2023 PV $)</th>
<th>Costs Total Incremental Present Value (PV) Costs² (2023 PV $)</th>
<th>Benefit-to-Cost Ratio</th>
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<tr>
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<td>2</td>
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<td>16</td>
<td>$752</td>
<td>$771</td>
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</tr>
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</table>
Flexibility
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.
2016 Code Cycle
20 Adopted Reach Codes

- EE: 17
- Solar: 3
- EV: 11

2019 Code Cycle
50 Adopted Reach Codes

- All-Electric: 27
- Electric-Preferred: 23
## 2025 Energy Code Timeline

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Dates (Subject to Change)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEC Kickoff Workshop – Compliance Tools &amp; Templates</td>
<td>March 22, 2022</td>
</tr>
<tr>
<td>Deadline to Submit New Measures (title24stakeholders.com)</td>
<td>April 15, 2022</td>
</tr>
<tr>
<td>Research Version of Energy Code Compliance Software</td>
<td>October 2022</td>
</tr>
<tr>
<td>Utility-Sponsored Workshops</td>
<td>August 2022 – April 2023</td>
</tr>
<tr>
<td>CEC Energy Code Accounting Workshop</td>
<td>November 10, 2022</td>
</tr>
<tr>
<td>Utility-Sponsored CASE Measure Reports to CEC</td>
<td>April 2023 – August 2023</td>
</tr>
<tr>
<td>CEC Preliminary Rulemaking Workshops</td>
<td>June 2023 – October 2023</td>
</tr>
<tr>
<td>File &amp; Open Formal Rulemaking</td>
<td>October 2023 – January 2024</td>
</tr>
<tr>
<td>Start 45-Day Public Comment Period</td>
<td>January 2024</td>
</tr>
<tr>
<td>Start 15-Day Public Comment Period</td>
<td>May 2024</td>
</tr>
<tr>
<td>CEC Adoption</td>
<td>June 2024</td>
</tr>
<tr>
<td>Effective Date</td>
<td>January 1, 2026</td>
</tr>
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</table>
Web Resources

- 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/
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](http://www.cesa.org/webinars)