REACH CODE NEWS BRIEF: FEBRUARY 2025

NEW REACH CODE RESOURCES FOR THE 2025 ENERGY CODE CYCLE

The statewide reach codes team has recently published two resources local jurisdictions will find useful in policymaking for the upcoming code cycle. These complementary documents are especially useful for local staff new to the reach code process.

Reach Codes Primer

This guide provides local government staff and officials with a better understanding of the fundamentals of reach codes including the development, adoption, and implementation processes. It discusses the common terminology and general timelines for a reach code development and adoption process before diving into the different stages in greater detail.

Option and Opportunities

This guide offers a high-level summary of local energy code opportunities. Energy is at the center of all decarbonization activities, with significant savings potential and GHG reduction impacts throughout the system. Opportunities to adopt local energy codes exist in several areas including:

- Operational Energy and GHG Emissions Reductions, both with efficient design and through information disclosure and performance improvement
- Embodied GHG Emissions
- Transportation/Mobility
- Water Efficiency

Both resources are available on the Resources webpage at no cost.

CEC/EPRI ELECTRIFICATION SUMMIT

The California Energy Commission (CEC) and EPRI will host the second annual Electrification Summit in Sacramento on March 11-12, 2025. This event explores affordable, reliable, and equitable pathways to electrifying buildings and industry.

Topics will include:

- CA's leadership on data-driven policies that maximize effectiveness and benefits of building decarbonization (BD)
- The current state of industrial heat pumps (HP) and their applications
- California Heat Pump PPP's progress in growing the public's and contractors' awareness
- Emerging research on health benefits of BD
- Successes and challenges, including state and federal funding, in implementing industrial decarbonization
- CA leadership on food processing decarbonization (FPIP)
- Reducing global warming potential of refrigerants in HPs
- Unlocking grid and customer benefits of BD, including bidirectional charging of electric vehicles
- Incentive programs that reduce the cost of BD, especially for justice communities

For more information, visit the Commission's event listing here.


STATE OF CALIFORNIA
ENERGY COMMISSION


EPRI

UPCOMING EVENTS

March 4: BayREN C&S Training: Residential New Construction

March 5: I-REN C&S Training: Heat Pump HVAC Technology: Commercial and Residential Applications

March 6: I-REN C&S Training: Residential Additions and Alterations

March 11-12: 2025 CEC / EPRI Electrification Summit. Sacramento.

March 12: 3C-REN Training: Nonresidential: Energy Code Implementation Series, with 2025 Code Updates

March 13-16: CivicWell: 33rd Annual Policymakers Conference. Yosemite

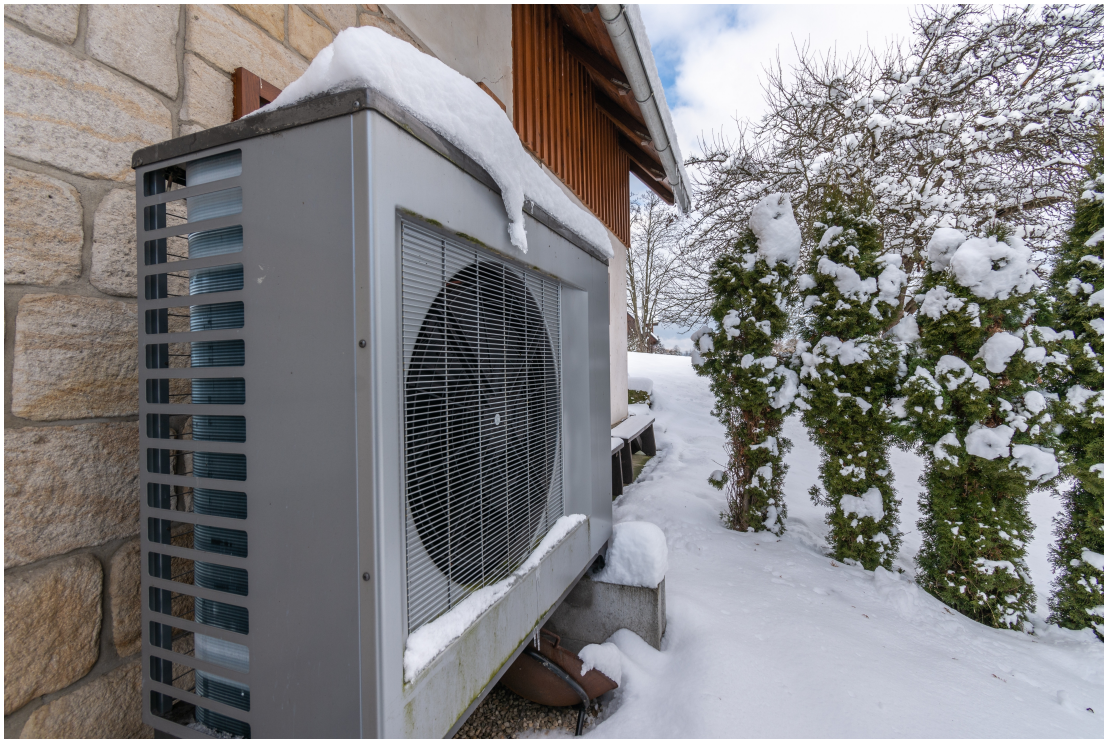
March 17: California Energy Commission: Business Meeting

March 19: BayREN Regional Forum: From Foundation to Finish: Fitting Embodied Carbon into our Decarbonization Goals

March 25: Strategic Growth Council and Governor's Office of Land Use and Climate Innovation: Catalyst Convening. San Diego.

March 26: Strategic Growth Council and Governor's Office of Land Use and Climate Innovation: Catalyst Convening. Los Angeles

NEW THIS MONTH!



HEAT PUMPS FOR COLD CLIMATES

In 2022, California's building code became the first in the nation to establish heat pumps as baseline technology for new homes, marking a huge step forward in transitioning the state's building stock away from fossil fuels and towards reliance on clean energy. In addition to statewide code updates, California's air quality agencies have approved or proposed amendments to existing regulations that will soon require zero-NOx appliances for some space and water heating applications across a variety of building types, although legal challenges are expected. The combination of these measures along with improved technology has led to an increase in heat pump adoption across the state.

Though widespread adoption has occurred in many regions, concerns remain about the viability of heat pumps in colder climates. Recent studies indicate that heat pump systems can work well in cold climates when properly sized and selected. Technological advances also continue, through efforts such as the US Department of Energy Cold Climate Heat Pump Technology Challenge described below.

Heat Pumps Overview

Air-source heat pumps (ASHPs) provide cooling and heating to a building and are powered solely by electricity. In the heating mode, instead of converting fuel to heat via combustion, a heat pump utilizes the refrigeration cycle to transfer heat from the air outside to the air inside the building. This makes ASHPs about two to three times more efficient than gas furnaces or electric resistance space heaters. Of course, the efficiency of any system depends on a variety of factors. Equipment sizing and installation, climate, a home's insulation and weatherproofing, and ongoing maintenance will affect the day-to-day performance.

Considering Outside Air Temperature

In heating mode, heat pumps have a harder time extracting heat from cold outside air, which can lead to performance issues due to a loss in efficiency and rated heating capacity. To address this issue, the US Department of Energy (DOE) conducted the Residential Cold Climate Heat Pump Challenge to incentivize manufacturers to improve system performance at lower temperatures (below 32° F).

For outside air temperatures above 32° F, performance degradation is not very significant and standard ASHPs suffice. Between 32° F and 5° F, ASHPs designed to the cold climate portion of Energy Star's heat pump specification maintain good efficiency and capacity. DOE's Challenge sought to further improve heat pump performance at 5° F and even -15° F. The DOE published findings from its challenge in the 2024 ACEEE Summer Study Energy Efficiency in Buildings. In the field, the tested CCHPs proved reliable and were able to provide equal or better comfort to homes compared to the previous furnace systems. Initial evaluations of the performance and efficiency of the units indicate promising results with all units capable of providing heat with little assistance from auxiliary elements even during the coldest weather.

The DOE announced in October 2024 that all eight manufacturers in the Residential Cold Climate Heat Pump Challenge completed rigorous laboratory and product field testing to demonstrate energy efficiency and improved performance in cold weather.

Performance Requirements

All CCHP prototypes tested in the challenge were centrally ducted units with electric resistance auxiliary heat backup sources and demand response capabilities. Two ranges of heat pumps were tested: one with CCHPs optimized for operation at 5° F and another with CCHPs optimized for operation at -15° F. All systems were required to meet or exceed the following performance requirements:

Seasonal Heating	- 8.5 HSPF2 (Region V) - Heating at 5 °F - Minimum COP of 2.1-2.4 at 5 °F - Capacity ratio of 100% for 5 °F capacity to 47 °F capacity - Minimum turndown ratio at 47 °F - Compressor cut-in and cut-out temperatures
Heating at -15 °F (optional)	HP operation at -15 °F as measured by compressor cut-in and cut-out temperatures
Auxiliary heat	Staged auxiliary heating
Low GWP Requirement	Employ refrigerant with a global warming potential (GWP) value of no more than 750 (AR4,100 year)
Connected Product Criteria	Offer the connected product capabilities within the latest ENERGY STAR specification (v6.1)

In standard heat pumps, the coefficient of performance (COP), a measurement of efficiency, typically drops significantly at cold outdoor air temperatures. When efficiency drops, most homes require supplemental heating to maintain occupant comfort, which results in higher utility bills for homeowners. For this reason, the DOE Challenge incentivized systems to not only maintain a favorable COP at 5° F, but also maintain 100% rated heating capacity at 5° F. With this level of performance, a homeowner's need for supplemental heat at colder temperatures would be significantly reduced.

Manufacturers from DOE's challenge are actively incorporating findings from both laboratory and field testing into their final product designs, which are anticipated to be commercialized and available for purchase in California by early 2025. This timing is critical for colder regions of the state, including the North Coast (CZ 1), High Desert (CZ 14), and Mountain (CZ 16) regions, where cold climate heat pumps will be particularly advantageous.

Additional Resources

More information about existing units can be found in the Northeast Energy Efficiency Partnerships' (NEEP's) comprehensive list of cold climate heat pumps which has detailed performance metrics for each heat pump. NEEP also has installer and consumer resources to help with equipment sizing and selection.

This program is funded by California utility customers and administered by Pacific Gas and Electric Company, San Diego Gas & Electric Company (SDG&E®) and Southern California Edison Company under the auspices of the California Public Utilities Commission and in support of the California Energy Commission.

OTHER REACH CODE NEWS BRIEFS

June 2026 May 2026 April 2026

Archives