

Zero Emission Buildings: Overview of Model Code Approaches

Residential and commercial buildings are one of the largest sources of carbon emissions for cities and counties in California, and roughly half of building emissions come from on-site combustion appliances like gas or propane furnaces and water heaters. Reducing these emissions is critical to achieve municipal and state climate goals.

While the new code has made progress on removing barriers to low-carbon electric space and water heating, it does not encourage the lower-carbon electric options over the standard gas-heated designs.

Local leadership is needed across California to jump start building decarbonization. The immediate opportunity is for cities and counties to adopt a local energy ordinance (a.k.a. a reach code) that would supplement the new statewide building code (either through the energy code or through the building code) and help local jurisdictions meet their climate goals. Cities and Counties throughout California have a history of adopting reach codes to achieve their climate objectives, including the County of Marin, and the cities of Palo Alto, Santa Monica, Fremont, and West Hollywood. Over 50 California jurisdictions are currently pursuing emissions reductions in new buildings.

The Building Decarbonization Coalition’s Zero Emission Buildings Task Force; in collaboration with the Investor Owned Utilities Codes and Standards Team, Natural Resources Defense Council, Sierra Club, TRC, BayREN, Build It Green, New Buildings Institute and San Francisco Department of Environment; present the following options for local government use across the State of California.

There are three primary approaches, in descending order of emission-reduction potential, are:

1. Electric Only
2. Emissions-Focused (Electric Preferred)
3. Efficiency-Focused (Fuel Neutral)

	Future Focused All-Electric	Emissions Focused Electric-Preferred	Efficiency Focused Fuel Neutral
Summary	No New Natural Gas Hookups	All-electric meets code. Mixed fuel must increase efficiency.	All fuel types increase efficiency
Residential		CALGreen Tier 1 for Mixed Fuel (28-75% better)	+Energy Efficiency for all buildings (27-44% better)
High-Rise Residential		5-10% better	4-10% better
Commercial		+Energy Efficiency for Mixed Fuel (5-15%)	+Energy Efficiency for all buildings (5-15%)
Average GHG* Savings		37%	21%

*GHG (Greenhouse gas) savings assumes 300 SFR units of 2200 sf each, 100 MF units of 1000 sf each: 2/3 using mixed fuel when allowed. Benchmarked against no reach code which assumes 80% use mixed fuel.

Electric Only

Summary: All-electric fuel sources are only legal way to build a new construction project.

Pros: Effectiveness and simplicity. Building officials simply need to comply with the energy code, while confirming that the project uses only electricity as a fuel source. Stops spending on infrastructure that would later need to be decommissioned.

Cons: Politically charged.

Ideal Application: The Electric Only option will be most successful in jurisdictions with strong political will to reduce climate, health and safety impacts of natural gas.

Emissions-Focused (Electric Preferred)

Summary: This option builds a preference for all-electric construction into the permitting process. All-electric designs do not have additional energy efficiency requirements. Projects that use fuels have additional requirements:

- Low-rise residential mixed fuel projects must comply with CALGreen Tier 1 (Title 24, part 11) energy use maximums.
- Non-residential mixed fuel projects must exceed code minimums by 5-10% depending upon location and building occupancy.

Pros: Allows for fuel choice while encouraging all-electric.

Cons: Unclear how effective it will be at encouraging all-electric construction.

Ideal Application: Any local government who wishes to start transitioning to clean fuels but does not want (or have the support) to eliminate the option of expanding natural gas infrastructure.

Efficiency-Focused (Fuel Neutral)

Summary: The Efficiency option treats all fuel types the same and requires that buildings exceed the energy code through a combination of energy efficiency, expanded solar generation and/or energy storage systems such as batteries. Please note, the stringency thresholds presented can be adjusted down, but recommended values are shown in the model code.

Pros: Requires all buildings to consume less energy

Cons: Does not encourage transitioning to all-electric

Ideal Application: Local governments who wish to remain fuel agnostic but continue to use energy more efficiently.