



Assembly Bill 3232 and the California Building Decarbonization Assessment

California has nearly 14 million homes and 7.5 million square feet of commercial buildings. These buildings produce a quarter of the state's greenhouse gas (GHG) emissions, making homes and businesses a major factor in climate change. Reducing these emissions is a key part of California's climate strategy.

Assembly Bill 3232 (Friedman, Chapter 373, Statutes of 2018) directs the California Energy Commission (CEC) to "assess the potential ... to reduce the emissions of greenhouse gases in ... residential and commercial building stock by at least 40 percent below 1990 levels by January 1, 2030."

The California Building Decarbonization Assessment was approved by the CEC and published in August 2021. It provides a framework to tackle the challenges in developing a path toward reducing greenhouse gas emissions associated with California's buildings.

Ambitious Carbon Neutrality Goals Call for Bold Action

Homes and businesses produce 25 percent of California's GHGs. The California Department of Housing and Community Development estimates 1.8 million new homes will be needed by 2025. This assessment offers a blueprint for the state to slash GHG emissions from buildings now and in the future.

The assessment was developed in collaboration with the California Public Utilities Commission and the California Air Resources Board, with public workshops held over several years. The assessment considers cost-efficient building decarbonization pathways, the benefits and barriers to building decarbonization, and ways that decarbonization can help the state meet and exceed its current clean energy goals. Importantly, these pathways also lead to better, healthier buildings for Californians to live and work in.



Building Decarbonization

[bil-ding dee-kahr-buh-nahy-zey-shun]

(noun)

1. a framework for reducing GHG emissions associated with buildings. Examples of decarbonization strategies include using clean energy generated onsite and from the electricity system, making buildings and appliances more energy-efficient, and reducing onsite use and leakage of natural gas and hydrofluorocarbon (HFC) refrigerants.

The Sources of Emissions

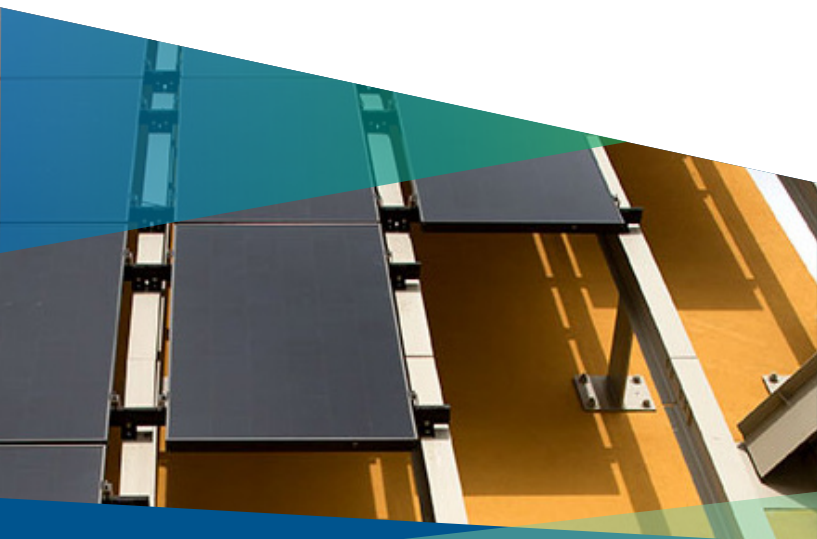
Building emissions stem from direct and indirect sources.

Direct emissions come from

- Combustion of fuels for heating and cooking (gas stoves, gas heaters).
- Gas leaks (gas lines in buildings, unlit pilot lights).
- Hydrofluorocarbon (HFC) leaks (from refrigerators and other compressor-based systems for space conditioning and water heating, during use and disposal).*

Indirect emissions come from generation of the electricity used in buildings.

**Although HFCs replaced previous refrigerants that depleted the ozone, they still have global warming potential (GWP) that's up to thousands of times higher than carbon dioxide.*





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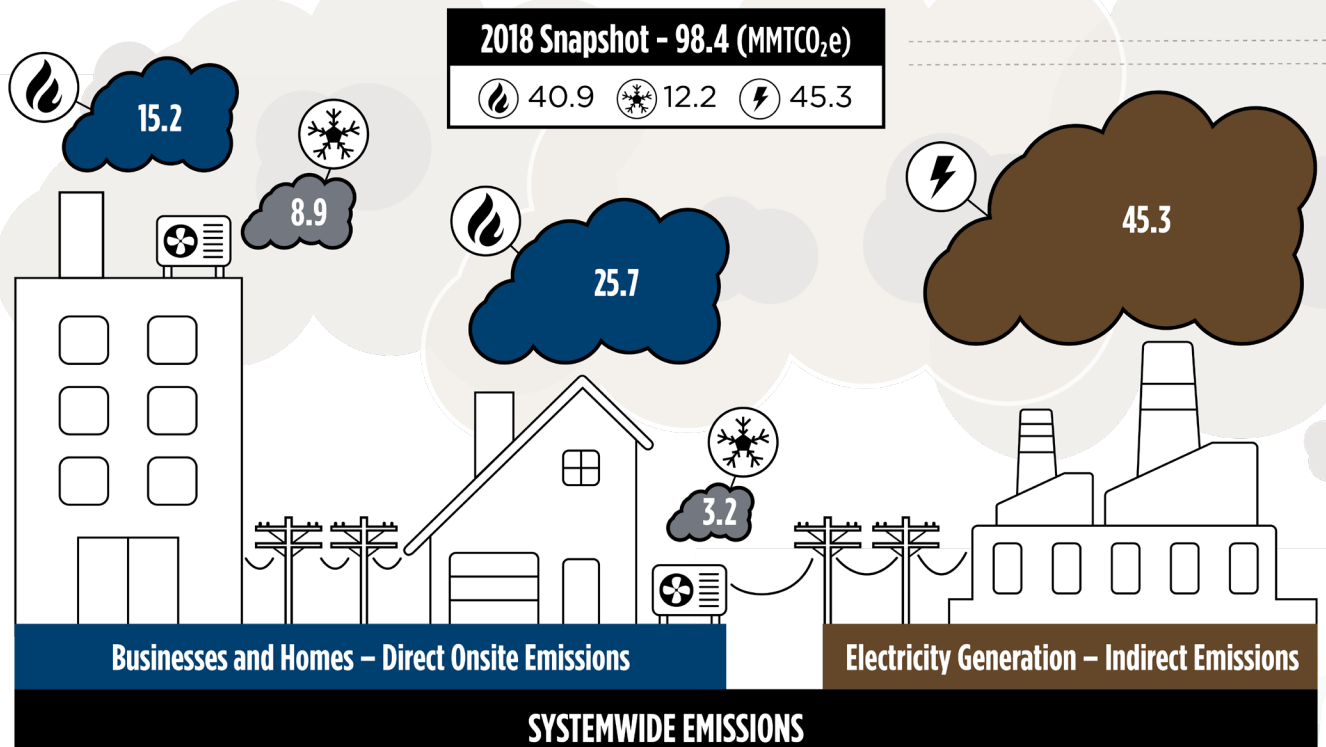
Seven Ways to Decarbonize a Building

The assessment recommends seven broad strategies for owners, builders, and utilities to cost-effectively decarbonize buildings.

1. Replace gas-fueled appliances with efficient electric alternatives.
2. Continue decarbonizing electricity by growing the low-carbon share of the generation portfolio.
3. Foster energy efficiency through incentive programs, appliance standards, building standards, research, and financing.
4. Transition to using better refrigerants and reduce associated leakage
5. Grow distributed energy resources such as rooftop solar photovoltaic (PV) and onsite battery storage.
6. Decarbonize the gas system by displacing natural gas with renewable gas produced from carbon-free electricity or existing waste streams.
7. Give building owners and occupants incentives to shift their electricity use in response to the timing of energy costs, GHG emissions intensity, or electricity grid emergencies.

2018 Greenhouse Gas Emissions from Buildings (MMTCO₂e)

 Combustion  Refrigerant (HFCs)  Electricity





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Better Air, Better Buildings, Better Living

California can reduce GHGs by more than 40 percent by 2030 through:

- Expanding use of efficient electric heat pumps.
- Investing in weatherization and electrification of existing buildings.
- Reducing refrigerant leakage.
- Planning for and promoting substitutes for natural gas in existing buildings, primarily electricity; considering renewable gases where available at reasonable cost.
- Investing in training to expand the clean energy workforce.

More than ever, government and stakeholders must work together to reduce GHG in buildings of all ages and locations, and do so in the most equitable way possible. As part of the 2021 Integrated Energy Policy Report process, the CEC is continuing to evaluate the building decarbonization strategies identified in this assessment to advance California's climate and clean energy policies in harmony with the state's response to the housing crisis.



The direct emissions of California buildings in 1990 were equal to:

54.4 million

metric tons of carbon dioxide equivalent



The target for 2030:

32.6 million

metric tons of carbon dioxide equivalent



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