

Reach Codes

These codes reduce fossil fuels in construction and offer health and safety benefits



The Impact

Reach codes reduce or eliminate fossil fuel use (primarily natural gas and propane) in buildings. They are usually mandated at the building permit stage, limiting gas heating, cooling, cooking and water heating equipment in new building construction. They can be made applicable to major remodels. Some reach codes also require electric vehicle (EV) charging infrastructure and photovoltaic (PV) panel and battery installation. A reach-code ordinance reducing and preventing the introduction of new natural gas installations will contribute greatly to a city's goal of lowering carbon emissions, making that city's response to the climate crisis stronger. Reach codes that require EV infrastructure will encourage more people to purchase more electric vehicles.

Description

Reach codes are building codes for new construction that “reach” beyond minimum state building construction energy code requirements to reduce or limit fossil fuels.

Where They've Been Implemented

In San Mateo County, Calif., as of June 2023, 17 cities, plus the County of San Mateo, and 13 cities in Santa Clara County, along with the County of Santa Clara, had approved codes that limit or partially ban the use of natural gas in new construction. According to the Sierra Club, 76 cities in California have adopted building codes to reduce their reliance on gas. The movement has spread nationally to about 24 other cities, and a few states, such as New York, have enacted gas bans. However, a backlash has prompted legislatures in more than 20 states to prohibit restrictions on gas bans in buildings. And Berkeley, Calif., is fighting a challenge to its ban that was struck down in 2023 by the U.S. Court of Appeals for the Ninth Circuit.

Background

Every three years, the California Energy Commission, working in conjunction with the California Building Standards Commission, adopts an updated version of the Building Energy Efficiency Standards – Title 24, Section 6 of California law. The latest code, which was adopted in 2022, became effective on January 1, 2023. Title 24 is applicable to new construction legally entitled after the effective date. Cities can opt to “reach” beyond the basic minimum requirements of Title 24, with reach codes that encourage or require electrification of all new construction. Cities may also adopt reach codes through their powers to regulate public health and through the adoption of other codes, such as changes to the National Electric Code (NEC) or their zoning ordinances

Key Drivers

All-electric buildings dramatically reduce carbon emissions, especially when they are coupled with renewable zero-carbon electricity sources such as solar and wind. In California, buildings are responsible for one-fourth of all state GHG emissions. All-electric buildings are cleaner, safer and less expensive to build. In addition, electric appliances are more cost-effective over time due to their energy efficiency, and they are healthier because they don’t emit toxic fumes. Improved safety also comes from fewer residential fires and less chance of pipeline fires. On average in the United States, a natural gas or oil pipeline catches fire every four days, results in an injury every five days, explodes every 11 days and leads to a fatality every 26 days, according to Fracktracker.org.

Key Factors for Success

Reach codes are generally implemented by elected officials, staff and the public who understand the impacts of natural gas on the health and safety of their constituents. Natural gas used in American homes is predominantly methane, a colorless, odorless gas extracted from the ground, often by fracking, which involves the high-pressure injection of sand, water and cancer-causing chemicals into the ground. A 2019 study gathered by researchers in six major U.S. cities found that the cities were leaking methane twice as much as previously thought. A 2022 Stanford study found that gas-burning stoves in U.S. homes have a climate impact comparable to the carbon dioxide emissions from about 500,000 gasoline-powered cars, and most of the emissions occur when the stoves are turned off. Methane is 80 times deadlier than carbon dioxide. Burning natural gas in home heating and cooking creates dangerous exhaust at levels that would be illegal if created outdoors.

In an effort to simplify the transition to all-electric homes, the City of Menlo Park, Calif., announced a partnership with BlocPower in June 2022 to electrify 10,000 homes and buildings by 2030. The program will focus on low-income neighborhoods and features a job training program that will create jobs while addressing the shortage of labor required to scale up the program.

Key Obstacles

There is often resistance to reach codes from elected officials, residential and commercial builders, the gas industry and members of the public who are unfamiliar with electrification. When elected officials are made aware of the deadly impacts of natural gas, there is a greater possibility they will adopt strong codes.

Builders are not eager to switch from their tried-and-true subcontractors and suppliers, and they believe renters and buyers will be less willing to rent or buy all-electric homes. Members of the public are often reluctant to give up appliances such as gas stoves and fireplaces. In addition, the upfront cost of electric appliances can be greater than their gas equivalents.

Yet electric appliances are cost-effective over time due to their energy efficiency, and many people who swear they will never have an electric stove change their minds when they try one of the

sleek new induction cooktops, which heat more quickly, turn off automatically when a pan is removed and can handle all types of cooking. As the public becomes supportive of all-electric homes, builders will follow suit.

Residential and commercial subcontractors for mechanical, electric and plumbing have skill sets in gas installation, but not so much in all-electric construction. Because subcontractors are not always knowledgeable about newer all-electric construction techniques, and because it is the subcontractor which assumes liability on construction projects, construction bids for all-electric construction can be unnecessarily higher than for gas installation. Some builders have found it useful to hire a consultant to work through this complicated process, with methodologies that are effective at resolving these problems.

Timeline for Implementation

Implementing reach codes is often time-consuming for staff and elected officials, due to the learning curve required. Meanwhile, government officials are responding to the threat of climate change by enacting stronger and stronger regulations. For example, California has a goal of reducing GHG emissions to 40 percent below 1990 levels by 2030, and the California Air Resources Board has banned the sale of natural gas-powered heating and hot water appliances starting in 2030. Over the next 25 years, there is expectation that natural gas will be phased out, as California reaches the “tipping point.”

Return on Investment

All-electric buildings are much less expensive to construct if the work is done during the original construction.

References and Resources

- [The Campaign for Fossil Free Buildings in Silicon Valley](#)
- Sustainable San Mateo County. [2022 Indicators Report on Building Electrification in San Mateo County](#)
- [Peninsula Clean Energy Model Ordinances](#), 2022
- [“Effects of Residential Gas Appliances on Indoor and Outdoor Air Quality and Public Health in California.”](#) University of California at Los Angeles, Department of Occupational and Environmental Health, April 2020
- [“Ten Truths About Natural Gas.”](#) Campaign for Fossil Free Buildings in Silicon Valley, 2019
- [“California Nears Tipping Point on All Electric Regulations for New Buildings,”](#) GreenTechMedia, July 29, 2020
- Stanford News. [Stanford Scientists Find the Climate and Health Impacts of Natural Gas Stoves Are Greater Than Previously Thought](#)
- Redwood Energy Construction Guides: [All-Electric Multifamily Guidelines](#), [All-Electric Commercial Guidelines](#), [All-Electric Single-Family Construction Guidelines](#). These guides include examples of all-electric construction as well as information on appliances and electric equipment.
- NRDC. [Pipeline Incident Statistics Reveal Significant Dangers](#). January 2, 2019
- [“A \\$4.5 Million Grant from the State Sparks Menlo Park’s Conversion to All-Electric Buildings.”](#) The Almanac, July 7, 2022

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