



Building Electrification Talking Points for Advocates and Local Government Staff

We believe in a **balanced approach to decarbonizing buildings** and welcome all cost-conscious and emission-free solutions. One of the most effective strategies is to electrify heating and hot water with super-efficient heat pump technology powered by renewable electricity.

All-electric buildings that employ **state-of-the-art technologies** such as modern heat pumps heaters, water heaters, and clothes dryers, as well as induction stove tops, are cheaper to build and operate, while providing superior comfort, performance, air quality, safety, and cooking experiences to their occupants.

According to the 2018 Integrated Energy Policy Report by the California Energy Commission, high rates of building electrification were found to be one of the **lower-cost** and **lower-risk** pathways to achieving deep decarbonization of buildings in California.

Cost Savings

Although there are differences throughout the state due to utility rates and climate variability, all-electric buildings typically cost less to build and operate than conventional gas-heated buildings.

- Building new single-family homes all-electric saves \$1,500 to \$6,000 in construction costs, and \$4,000-10,000 on utility bills over 20 years¹.
- A typical home saves up to \$540 in utility costs per year² before any incentives.
- Adding solar saves up to an additional \$500 in utility costs per year¹.

Healthier Air

- Burning of gas, propane, and wood in buildings produces harmful indoor air pollution, that has been tied to increased risk of respiratory disease and greater impacts on those with existing respiratory conditions. Electric appliances eliminate these conditions resulting in healthier indoor air quality.³
- Burning gas and propane in buildings is responsible for 6 times higher nitrogen oxide (NOx) emissions than from all in-state power plants.⁴

Safety

- Natural gas is major risk factor during earthquakes and is responsible for 20% to 50% of post-earthquake fire ignitions⁵. In the 1994 Northridge 6.7-magnitude earthquake, 50% of the fires were caused by natural gas.
- Natural gas can cause significant leaks like Aliso Canyon (2015-2016) and explosions, as in San Bruno (CA) in 2010, Merrimack Valley (MA) in 2018, and San Francisco in 2019.



Clean Energy and Climate Action

- Leaks from gas pipelines and distribution equipment are common nationwide with more than 2.3%⁶ or more of the gas leaking from extraction to the gas meter⁷. Another 0.5% is found to be leaking in homes⁸. As methane is a powerful greenhouse gas, 3% leakage doubles the climate impact from natural gas combustion over a 20-year horizon.
- Electrification can **reduce** greenhouse gas emissions from heating and hot water by **up to 70%**⁹. Buildings are the second largest contributor to GHG emissions in CA behind the transportation sector.
- As electricity from the grid gets even cleaner (moving toward 100% carbon-free by 2045), emissions will eventually be reduced to zero.
- Modern electric buildings support the electrical **grid of the future**. They contribute to grid stability and reliability, by storing renewable electricity in water heaters, batteries, and electric vehicles when renewable energy is abundant on the grid, and using that energy during peak demand periods.

Renewable Gas

- There is very little renewable gas available today (less than 1% of current use versus 34% renewable electricity in 2018), and the potential future supply from sustainable sources is limited.
- Renewable gas is much more expensive than fossil gas, while renewable electricity is getting cheaper than electricity from gas power plants.
- When produced sustainably, renewable gas can play a limited role in reducing emissions, but given its scarcity and high cost, it is unlikely to ever replace a large enough share of the state's fossil gas use. The limited supply may be better used where it is most impactful in harder-to-decarbonize sectors, for example, in certain industrial and heavy machinery applications.
- Natural gas is more than 90% methane, a highly potent greenhouse gas. Any unburned gas, renewable or not, that escapes through leaky pipes contributes disproportionately to climate change.
- Renewable natural gas will not eliminate the concerns of indoor air quality or safety, raised in the previous sections.

¹ Synapse Energy Economics, "Decarbonization of Heating Energy Use in California Buildings", October 2018.

² Energy and Environmental Economics, "Residential Building Electrification in California". Mahone, A., et al, April 15, 2019.

³ Logue, Jennifer M., et al. "Pollutant Exposures from Natural Gas Cooking Burners: A Simulation-Based Assessment for Southern California", *Environmental Health Perspectives*, January 1, 2014.

⁴ California Air Resources Board: <https://www.arb.ca.gov/ei/emissiondata.htm>

⁵ Improving Natural Gas Safety in Earthquakes, California Seismic Safety Commission: July 11, 2002.

⁶ Alvarez, R., et al. "Assessment of methane emissions from the U.S. oil and gas supply chain," *Science*. July 13, 2018. Vol. 361, Issue 6398, pp. 186-188.

⁷ Environmental Defense Fund, "Synthesis of U.S. methane measurements", June 2018.

⁸ Natural Gas Methane Emissions from California Homes, California Energy Commission, August 2018.

⁹ Natural Resources Defense Council, Expert Blog: "Electric Heat Pumps Can Slash Emissions in California Homes." Delforge, Pierre and Anna Brockway. November 16, 2018. <https://www.nrdc.org/experts/pierre-delforge/electric-heat-pumps-can-slash-emissions-california-homes>