

ALL ELECTRIC BUILDINGS ARE GOOD FOR OUR CLIMATE, OUR HEALTH, AND OUR SAFETY.

In Washington State, emissions from buildings are growing at a faster rate than any other source of carbon pollution, with this increase largely attributable to the use of fossil gas in homes and buildings. Combusting fossil gas in homes and buildings is not only a [significant contributor to climate change](#), but also poses significant health risks for our communities, children, and other vulnerable populations.

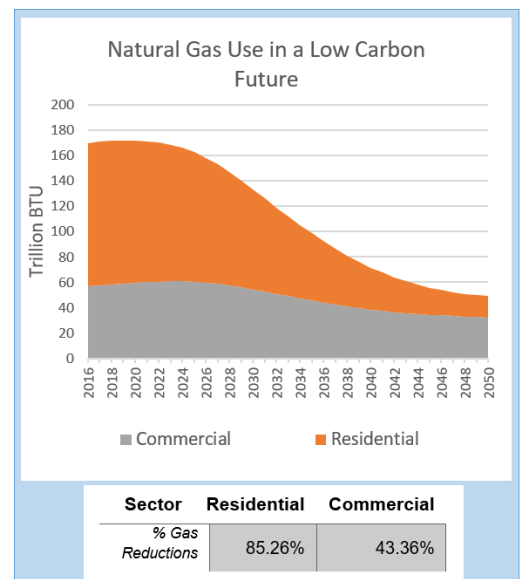
Many cities are increasingly looking at ensuring all new buildings are electric as a key cost-effective pathway for achieving their local or state greenhouse emissions goals. Electrifying buildings is critical to addressing climate change, but it is also achievable, affordable, safe, and creates a more resilient energy system.



Electrifying buildings is a key component of the most cost-effective pathway to achieving deep greenhouse gas emissions reductions.

According to Washington’s Deep Decarbonization Pathway Study, the [lowest cost pathway for achieving 80% carbon reductions economy-wide by 2050 relies on electrifying our buildings](#), reducing the residential sector’s use of gas by 85%. **A continued reliance on gas to achieve deep reductions was much more costly.**

These findings align with the Clean Energy Transition Institute’s Pathways to a Clean Energy Future for the Northwest study, which also found that [electrifying buildings is substantially more cost-effective than a limited electrification pathway](#).





Natural gas combustion in the home has significant negative health implications and impacts to indoor air quality.

Indoor air quality in homes that combust gas is shown to be worse than outdoor air quality in many industrial cities.

Combusting gas releases a number of pollutants inside our buildings and homes, including carbon monoxide, particulate matter, nitrogen oxide, lead, and formaldehyde. A recent UCLA study provides an in-depth look at the [range and concentrations of pollutants resulting from use of indoor gas appliances](#), finding after cooking for just an hour with a gas stove and oven, the levels of nitrogen dioxide exceed both state and federal outdoor air-quality standards in more than 90% of the homes. These chemicals are very harmful to human health, especially to children and individuals with respiratory illnesses. A list of acute and chronic health impacts associated with gas exposure are found in the table below. Additionally, a recent study in Australia found that [over 12% of asthma cases in children can be directly attributed to using gas stoves indoors](#).



In fact, just living in a home with gas cooking increases a child's chance of developing asthma by 42%.

Pollutant	Health Effects	
	Acute	Chronic
Nitrogen oxide (NOx)	Decreased lung function, asthma exacerbation, respiratory infection, stroke	Premature mortality, lung and breast cancer, cough, shortness of breath, asthma, wheezing, respiratory illness in children
Carbon monoxide (CO)	Death, brain damage, seizures, memory loss, dementia, headaches, dizziness, nausea	Brain and heart toxicity, heart failure and cardiovascular disease, low birth weight
Fine particulate matter (PM 2.5)	Stroke, increased blood pressure	Premature mortality, bronchitis, asthma onset and exacerbation, low birth weight and preterm birth
Ultrafine particles (UFP)	Increased blood pressure	Cardiovascular disease, neurological disorders
Formaldehyde	Respiratory/eye/skin irritation, sneezing, coughing, nasal congestion, drowsiness, chest tightness, shortness of breath, asthma exacerbation, death (higher doses)	Cancer, asthma and bronchitis in children, damage to respiratory system, headaches, sleep disorders, memory loss, birth defects, low birth weight, spontaneous abortion

Effects of Residential Gas Appliances on Indoor and Outdoor Air Quality and Public Health in California, <https://ucla.app.box.com/s/xyzt8jclixnetiv0269qe704wu0ihif7>

We also know that vulnerability to COVID-19 and exposure to poor air quality are directly linked.

A recent study by Harvard found, "A [small increase in long-term exposure to PM2.5 leads to a large increase in the COVID-19 death rate](#) [underscoring] the importance of continuing to enforce existing air pollution regulations to protect human health both during and after the COVID-19 crisis."

Indoor air quality issues are particularly concentrated for low-income residents in smaller units with poor ventilation. [Communities of color are already disproportionately impacted by outdoor air pollution](#), and should not continue to be disproportionately harmed by poor indoor air quality as well.

Gas appliances also worsen our outdoor air quality, with California's residential appliances releasing more than two times as many NOx emissions as all of their gas power plants combined, and commercial gas appliances releasing just as much NOx pollution as all of California's cars.





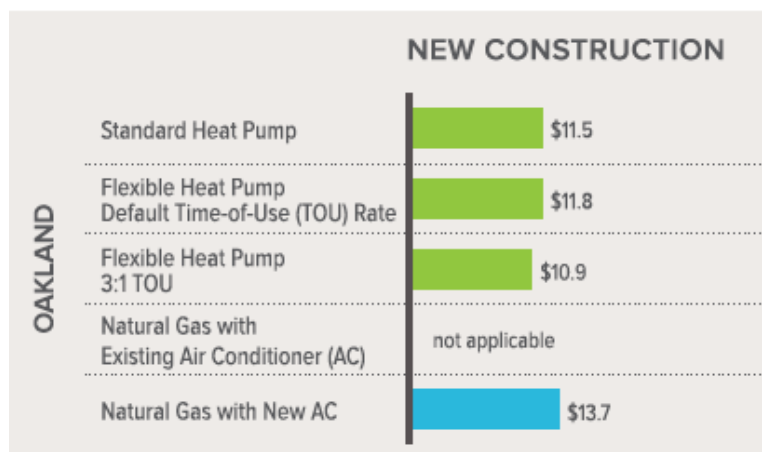
With Washington's low-cost electricity—soon to be 100% clean—all-electric buildings can save customers money, especially when installing air conditioning.

A Decarbonization of Heating Energy Use in California Buildings paper finds that [the upfront costs of electric heating systems are \\$1,500 lower than conventional gas alternatives](#). E3's Residential Building Electrification in California study reached similar conclusions on the [cost-effectiveness of all-electric buildings](#), and Point Energy's UC Carbon Neutral Buildings Cost Study found [all-electric buildings are comparable to or even slightly less expensive than gas](#) plus electric buildings over a 20-year life cycle cost, even though California's electricity rates are more than double Washington's. When looking at capital costs only, they found that all-electric residential buildings are actually 6% less costly.

The Rocky Mountain Institute's (RMI) Economics of Electrifying Buildings study, as well as several other studies, have found multiple scenarios in which [all-electric new homes and buildings save customers money over the lifetime of the building](#). This is particularly true when including air conditioning for new construction since electric heat pumps serve as both a heat source and an air conditioner. As our region continues to see sustained hotter temperatures and smoke as an increasingly serious public health threat we expect a substantial increase in air conditioning in new buildings. At right is RMI's cost comparisons for single-family new construction heating costs in Oakland, which is in the same climate zone as Western Washington. In Western WA, approximately 50-75% of new town homes and single-family housing already have air conditioning included, and as heat pump costs continue to decline, this share will continue rising. Including construction costs, gas and electricity are fairly comparable, with gas being somewhat more expensive.



Photo: Marcela Gara, Resource Media

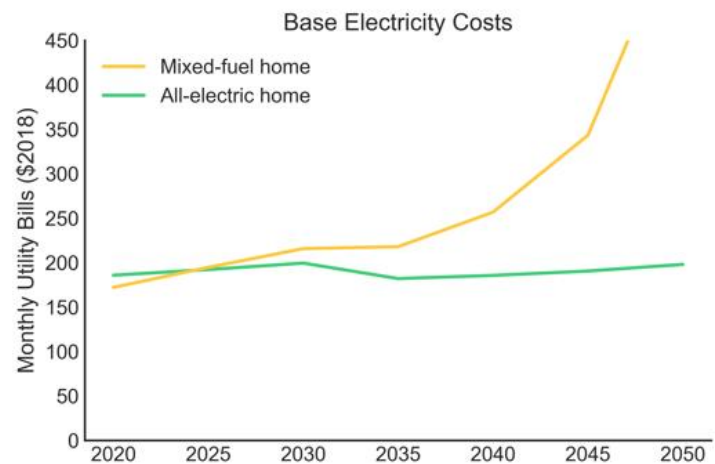


Additionally, utility customers can benefit from more stable energy prices as they reduce dependence on volatile fossil fuels and transition to clean electricity. In particular, low-income customers will be able to utilize robust energy assistance programs from electric utilities as required by Washington's 2019's Clean Energy Transition Act.



Requiring 100% clean new buildings will prevent an unnecessary expansion of gas infrastructure that poses a risk of stranded assets.

New buildings often have a life expectancy of over 50+ years, and the pipeline system has similarly long lifespans. New buildings and gas infrastructure become exiting infrastructure, and the cost of transitioning off of gas is likely to result in stranded assets. The California Energy Commission commissioned a Natural Gas Infrastructure study, which specifically noted the [importance of planning now for the transition away from gas, and highlighted requiring new buildings to be all-electric as a primary strategy to effectuate the transition](#). While keeping in mind that the graphic at right is from California, it shows that **utility bill crossover happens in 2025 if we set the gas sector on a phase-out pathway, and by 2050, gas homes would be paying double compared to all-electric homes.**



The homes least likely to be able to switch will be low-income households. This means that any new gas household we allow, especially for low-income residents, heightens the severe risk that we are stranding those families with an escalating bill. While Washington currently requires extensive low-income bill assistance for electricity service, no parallel requirement exists for gas utilities. Therefore, if we strand vulnerable customers with an increasingly unaffordable technology, their utilities have no obligation to provide aid.

All-electric buildings are safer, protect our communities against gas explosions, and increase the resiliency of our building infrastructure.

A gas pipeline [recently exploded in Lincoln County, KY](#), killing at least one person and injuring others, and Seattle experienced a similar [gas explosion in Greenwood](#) a few years ago. There are many more examples of these kinds of incidents, which pose significant threats to the safety of our communities. **Most significantly, the risk of earthquakes in our region increases the acuity of the issue.** Highly pressurized gas pipelines run a high risk of exploding during earthquakes and of causing fires and immediate danger. All-electric buildings are more resilient following natural disasters as electricity can be restored more quickly than repairs can be made to ruptured gas lines.



Greenwood pipeline explosion in 2016



Putting Washington on the path to 100% clean buildings will create a significant number of new jobs.

The Luskin Center for Innovation at UCLA commissioned a study evaluating workforce needs and impacts for a full transition to electric buildings in California. While the study found some impacts on a few sectors, **the net impact was an overwhelming increase in job creation.** Luskin found net job creation in California is likely to [be in excess of 100,000 new annual positions](#), and because Washington does not have an extraction industry, the job losses would be lower and the net benefits would be higher. Washington is likely to see similar benefits scaled to our size and current gas usage. Requiring new buildings to be all-electric is the first step in this transition.

