A clean, safe, affordable, and resilient built environment powered by 100% clean electricity.

**THE FUTURE OF IS ALL-ELECTRIC**
WHY

buildings? Why now?
Emissions from the built environment are literally on the rise

Our homes and buildings are Washington’s second highest source of emissions after transportation. It’s the *fastest* growing source of emissions because of increased use of fossil gas to heat our homes and buildings and the largest source of toxic air pollution in the United States.
is Washington now?
Washington's emissions: Then, Now, and in 2050

GHG Emissions (Millions of CO2e)

<table>
<thead>
<tr>
<th>Year</th>
<th>Emissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>88.4</td>
</tr>
<tr>
<td>2000</td>
<td>108.6</td>
</tr>
<tr>
<td>2017</td>
<td>97.5</td>
</tr>
<tr>
<td>2050 (RCW 19.235)</td>
<td>4.42</td>
</tr>
<tr>
<td>2050 (DDP Study)</td>
<td>17.68</td>
</tr>
</tbody>
</table>

- Increase: +10.3%
- Decrease: -95.5%
- Decrease: -81.9%
We’re not on track

We are here

- Electricity
- Pipeline Gas
- Jet Fuel
- Diesel
- Gasoline
- Steam
- Other
- Goal
The Low Carbon Pathway
The Low Carbon Pathway: *How do we get there?*

Business as usual | Reductions necessary
---|---
50.49% | 89.99%
48.21% | 92.56%
14.42% | 96.33%
–0.73% | 67.21%
–19.3% | 99.6%
Electrification is the lowest cost pathway

WA’s electricity is already low-cost and will be 100% clean by 2045 (due to 2019’s Clean Energy Transition Act). Gas use needs to decrease for the state to meet its emissions goals (updated in 2020 with HB 2311).
Why does gas use matter?
Health Effects of Pollution from Gas Stoves and Buildings

Andee Krasner, MPH
Program Manager, Climate and Health
akrasner@gbpsr.org
The False Promise of “Natural” Gas

The Gas Industry Is Paying Instagram Influencers to Gush Over Gas Stoves

Not pictured: toxic fumes.
Burning “Natural” Gas in Buildings Harms Health

- Exacerbating health impacts of climate change
- Safety
- Indoor/Outdoor Air Pollution
HEALTH EFFECTS FROM GAS STOVE POLLUTION

PUBLISHED MAY 5, 2020
We spend up to 90% of our time indoors.

EPA states indoor pollutant levels may be 2 to 5 and as much as 100 times higher indoors than outdoors.

Homes with gas stoves have 50 - 400% higher NO₂ emissions than homes with electric stoves.

https://rmi.org/insight/gas-stoves-pollution-health/
Indoor NO2 Emissions from Gas Stoves Often Exceed Outdoor Standards

<table>
<thead>
<tr>
<th>Outdoor Standards for NO₂</th>
<th>1-hr average (ppb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US National Standard (EPA)</td>
<td>100</td>
</tr>
<tr>
<td>Canadian National Standard</td>
<td>60</td>
</tr>
<tr>
<td>California State Standard</td>
<td>180</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indoor Guidelines for NO₂</th>
<th>1-hr average (ppb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>90</td>
</tr>
<tr>
<td>World Health Organization</td>
<td>106</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measured NO₂ Emissions from Gas Stoves</th>
<th>Peak (ppb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baking cake in oven</td>
<td>230</td>
</tr>
<tr>
<td>Roasting meat in oven</td>
<td>296</td>
</tr>
<tr>
<td>Frying bacon</td>
<td>104</td>
</tr>
<tr>
<td>Boiling water</td>
<td>184</td>
</tr>
<tr>
<td>Gas cooktop - no food</td>
<td>82–300</td>
</tr>
<tr>
<td>Gas oven - no food</td>
<td>130–546</td>
</tr>
</tbody>
</table>

https://rmi.org/insight/gas-stoves-pollution-health/
Health Effects of NO2 in Children May Include:

- IQ, Learning Deficits
- Irritated airways
- Increased susceptibility to lung infections
- Increased risk of childhood asthma (current and lifetime)
- Aggravated respiratory symptoms (wheeze, cough, chest tightness, difficulty breathing)
- Deleted tissue antioxidant defenses (which protect the respiratory tract)
- Changed lung function
- Cardiovascular effects
- Increased susceptibility to allergens

https://rmi.org/insight/gas-stoves-pollution-health/
Lower-income Households May be at a Higher Risk of Exposure to Gas Stove Pollution

FACTORS CONTRIBUTING TO HIGHER LEVELS OF NO2 IN HOMES:

- Smaller unit size
- More people per home
- Older homes, inadequate ventilation
- Using the stove/oven for supplemental heat
- Higher exposure to outdoor pollution
- Greater asthma burden

https://rmi.org/insight/gas-stoves-pollution-health/
Recommendations for Individuals

TO REDUCE OR ELIMINATE EXPOSURE TO GAS STOVE POLLUTION

Install & maintain a CO detector

If available, run your exhaust hood while cooking

Open a window while cooking

Cook on the back burners

Use other electric appliances more (kettle, toaster oven, microwave)

Switch to an electric/induction stove

Try a plug-in induction stove ($50)

https://rmi.org/insight/gas-stoves-pollution-health/
OUTDOOR AIR POLLUTION
Burning fossil fuels in buildings generates more than two times as much as NOx as power plants

Nitrogen Oxides (NO\textsubscript{X}) in Washington and Oregon (2014)

Source: EPA National Emissions Inventory 2014
Buildings are the #1 Source of Pollution-Related Premature Deaths

WASHINGTON: Premature Deaths from PM2.5 & Ozone Emissions from Combustion Sources (by Sector)

*all combustion emission sources include gas, wood, oil, propane, etc. from the commercial and residential building sector.
Buildings are the #1 Source of Pollution-Related Premature Deaths

OREGON PREMATURE DEATHS FROM PM2.5 & OZONE EMISSIONS FROM COMBUSTION SOURCES (BY SECTOR)

Source: Dedoussi et al., Nature Feb 2020 (MIT study- supplemental material). Graph depicts in-state and cross-state pollution. *all combustion emission sources include gas, wood, oil, propane, etc. from the commercial and residential building sector.
What is the health cost of gas appliances? It is not zero.

Approximately **600,000** Washingtonians have asthma. Annual statewide cost of asthma related hospitalizations: $73 million.

In California, if all **gas-fired appliances** were replaced with **electric alternatives**, the cleaner air would save: **$3.5 BILLION in Healthcare Costs Every Year**

Average cost of each asthma hospitalization: **$33,000** (2010)

Cost of an electric stove: **$500-$1,000**

Sources: Knibbs et al., UCLA (2020)
https://www.doh.wa.gov/DataandStatisticalReports/DiseasesandChronicConditions/AsthmaData#:~:text=The%20U.S.%20Centers%20for%20Disease,14%20men%20currently%20have%20asthma,
Air quality and COVID-19

We know that exposure to pollutants has impacts increasing risks from COVID-19. A recent Harvard study found a small increase in long-term exposure to PM2.5 leads to a large increase in the COVID-19 death rate. People over the age of 65 are at greater risk from PM 2.5 exposure affecting COVID-19 mortality.
Environmental (in)justice

Segregation and redlining have led to BIPOC communities, particularly Black communities, being pushed to live in places where there is already greater exposure to air pollution. Black, Latinx, and Asian people, as well as people with lower socioeconomic status, have higher risks of premature death from particle pollution. Lack of access to healthcare, jobs, grocery stores, and more also lead to disparate health impacts for vulnerable communities.

“The burden of air pollution is not equally shared.”
American Lung Association’s 2020 “State of the Air” Report
Safety Impacts

Pipeline explosions and gas leaks pose a risk to our communities nationwide, but also close to home. Recent Seattle neighborhood instances of the Greenwood explosion in 2016 and gas leak in Ballard in 2020, as well as the daily volume of 911 calls reporting “natural gas odor” or “gas leak” continue to be regular occurrences.

911 Seattle
From 2019 to present there were nearly 600 calls regarding "gas leaks, major gas leaks, or gas odor."
Safety Impacts

Earthquake risk makes Washington St particularly vulnerable because highly pressurized gas pipelines run a high risk of exploding during earthquakes and 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.
What does this mean for my community?
Positive gain for WA St economy

Because Washington does not have an extraction industry, we would have lower job losses and higher net benefits. We’ll see job increases in: equipment manufacturing, renewable energy construction, electricity generation and distribution, building electrification. Study in CA showed that net increase of jobs in the state is likely to be over 100,000 new annual positions by 2045.
ES Figure 2. Employment Impacts by Industry, Low and High Estimates (Average Annual)

<table>
<thead>
<tr>
<th>Industry</th>
<th>Average Annual Jobs (Low)</th>
<th>Average Annual Jobs (High)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Gas Production</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gas Distribution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity Generation,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transmission, and Distribution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction Activity*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Construction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building Retrofits</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ES Figure 3. Average Annual FTE Jobs Due To Building Electrification

- Residential + Small Commercial Retrofits
- Large Commercial + MUSH Retrofits
- New Construction
- Manufacturing
- Renewable Energy Construction Activity
- Electricity Generation, Transmission, and Distribution
- Gas Production

Job growth over 2045
How do we build all-electric?

Suraj Lobo
Progessive Comfort Solutions

“One of my favorite things to do... Demo'ing a fossil fuel gas furnace. We installed a Mitsubishi 3 zone ductless mini-split system to this 2 bedroom home in North Seattle. And now they are fossil fuel free!”
Cost savings are part of the plan

**Upfront costs of electric heating systems are $1,500 lower than gas.** Life cycle costs of electric are comparable or lower than gas plus electric. And WA’s electricity costs are lower than CA’s! Additionally, utility customers will benefit from more stable energy prices as they reduce dependence on volatile fossil fuels.

<table>
<thead>
<tr>
<th></th>
<th>NEW CONSTRUCTION</th>
<th>RETROFIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Heat Pump</td>
<td>$11.5</td>
<td>$22.9</td>
</tr>
<tr>
<td>Electric Heat Pump</td>
<td>$11.8</td>
<td>$22.9</td>
</tr>
<tr>
<td>Flexible Heat Pump 2.1 TOU</td>
<td>$10.9</td>
<td>$20.8</td>
</tr>
<tr>
<td>Natural Gas with Existing AC</td>
<td>non-applicable</td>
<td>$16.1</td>
</tr>
<tr>
<td>Natural Gas with New AC</td>
<td>$13.7</td>
<td>$24.2</td>
</tr>
</tbody>
</table>
Less gas now, lower costs later

If we don't make this transition now, new buildings constructed with gas hook-ups will last over 50 years. As we transition off gas, fewer people will be paying to maintain gas infrastructure so costs will go up for those customers. The homes least likely to switch now will be low-income homes, who will then carry a greater cost burden in the future.
How do we move towards solutions?
100% clean is closer than you think

We can ensure 100% clean buildings for all new construction by:

- Incentivize electric heating and appliances
- Change state statutes to support beneficial electrification so that utilities can support customers who want to switch to electric sources
- Provide retrofit assistance for low-income customers
- Support a just transition and potential training for workers currently employed in gas-related work
Electrification has already started
We can lead in the Pacific Northwest

San Jose Approves Ban Of Natural Gas In New Construction Projects

New Jersey Sets Goal to Cut Natural Gas Use 80% by 2050
The opposition has already started too
Green-washing gas

Washington and Oregon natural gas companies, rattled by local proposals that could shift more buildings to electricity, will spend $1 million on a public-relations campaign to promote their fuel as part of the region’s clean-energy future.

By Hal Bernton and Daniel Bockman

Daily Times Staff Reporters

The Seattle Times

AP FACT CHECK: Trump called new tax bill ‘Special’

US long-term mortgage rates rise; 30-year at 2.96%

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Natural gas industry’s $1 million PR campaign sets up fight over Northwest’s energy future

Dec. 22, 2019 at 6:06 pm | Updated: Dec. 22, 2019 at 4:17 pm

The Seattle Times

The Gas Industry Is Paying Instagram Influencers to Gush Over Gas Stoves

Puget Sound Energy Wants Your Kids to Love Natural Gas

Color your way through Natural Gas Town and learn how natural gas provides energy to your neighborhood! ms.4apr.ly/6017Tyh1F

Puget Sound Energy

@PSTalk

9:31 am · 23 Jun 2020 · Sprinkl Publishing

Reliable. Affordable. Natural Gas. Here for you.

partnership for energy progress

About Us | Partners | Data & Resources
What can you do?

1. **Spread the word** and this info to others you know

2. **Contact your local elected officials** to ask them to lead on electrifying our buildings

3. **Stay up-to-date and engaged** with Stand.Earth and Climate Solutions!