

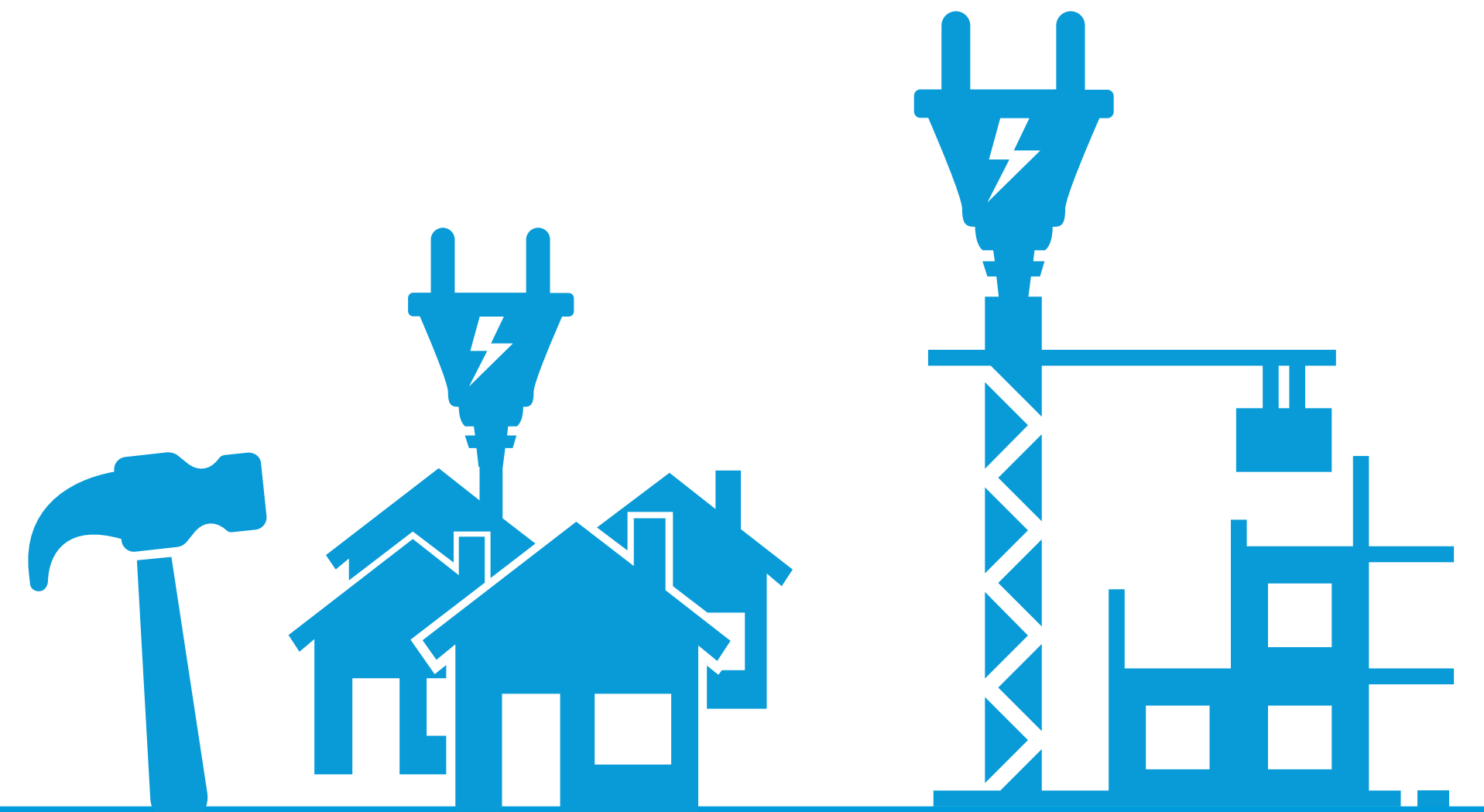
A clean, safe, affordable, and resilient
built environment powered by
100% clean electricity

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



BUILDING

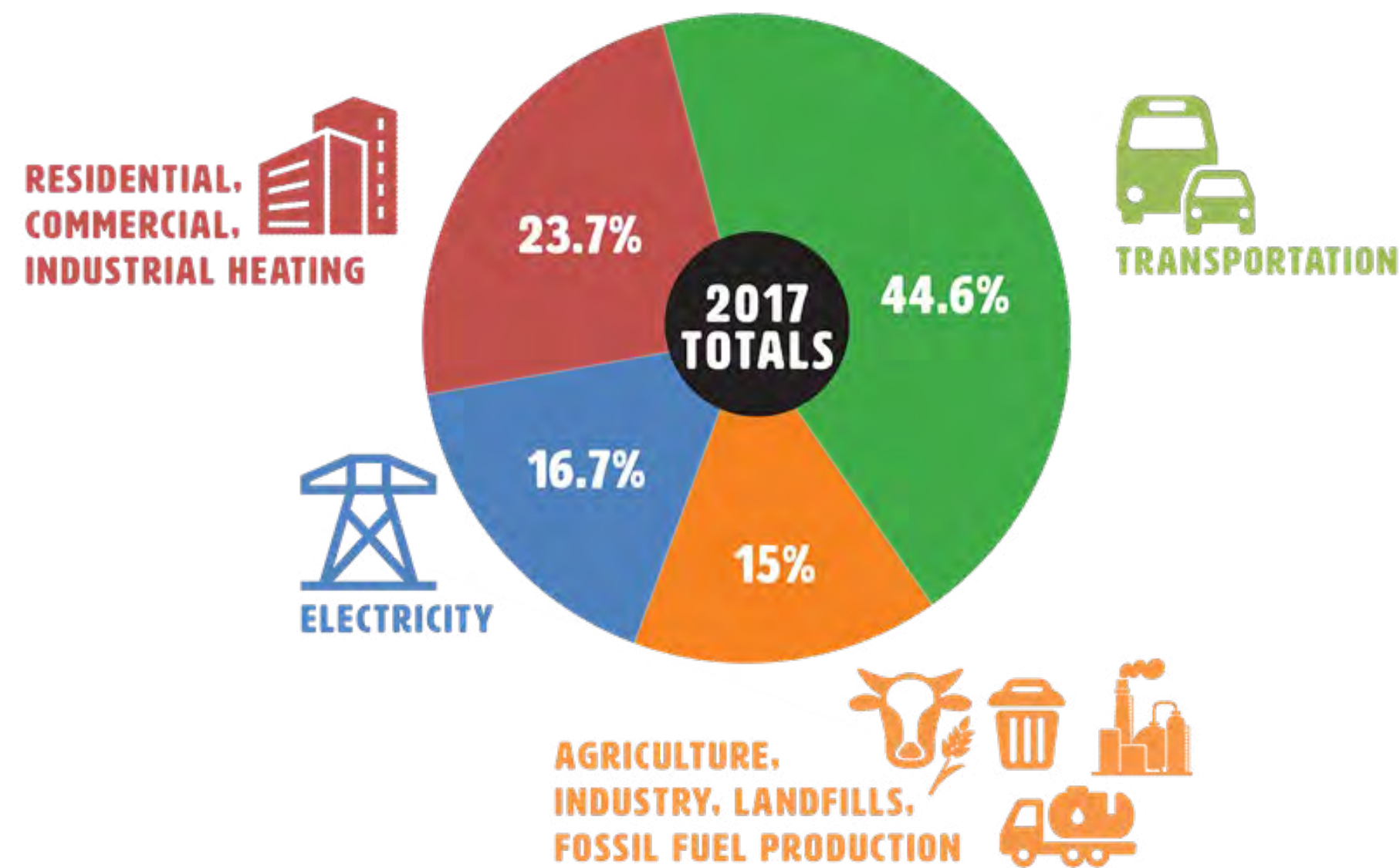
WHY



buildings? Why *now*?



Sources of Washington's greenhouse gas emissions



WA Department of Ecology

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.



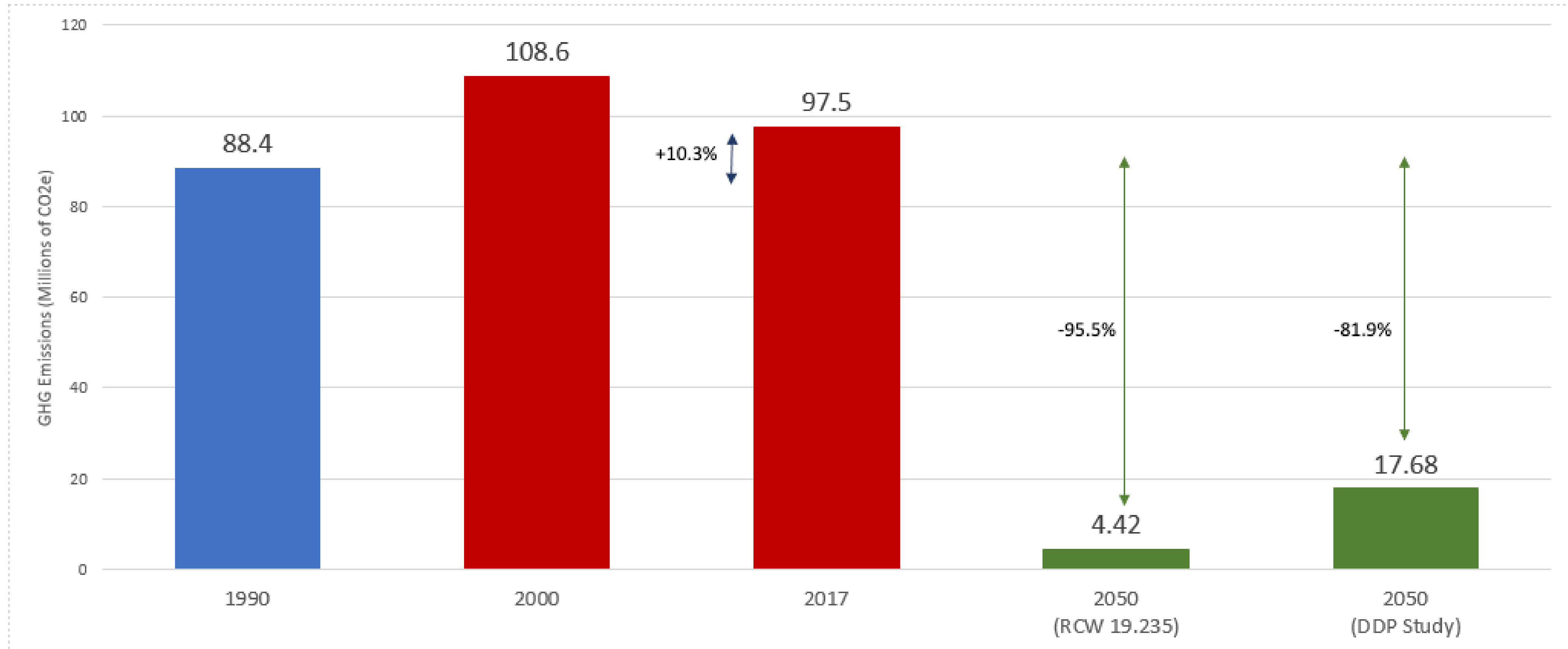
WHERE



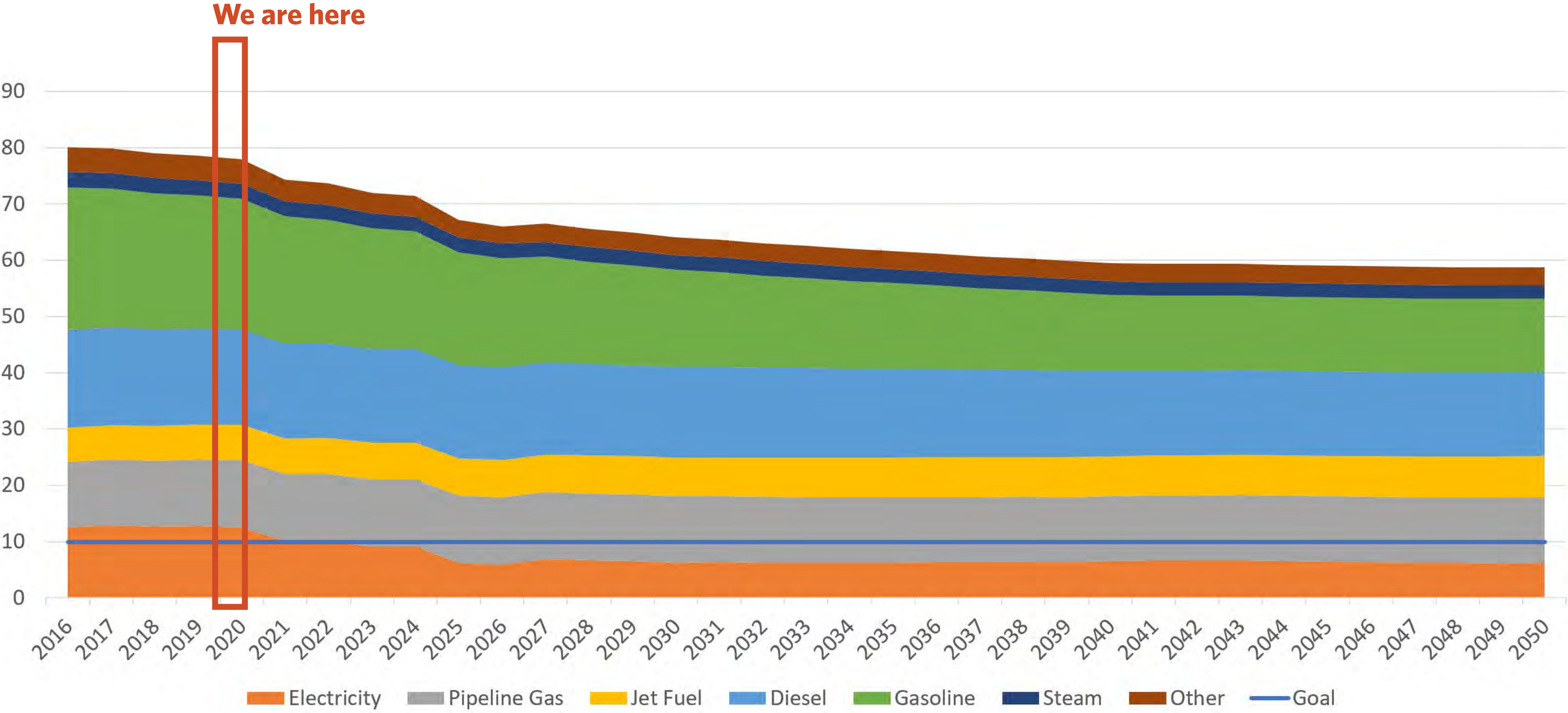
is Washington *now*?



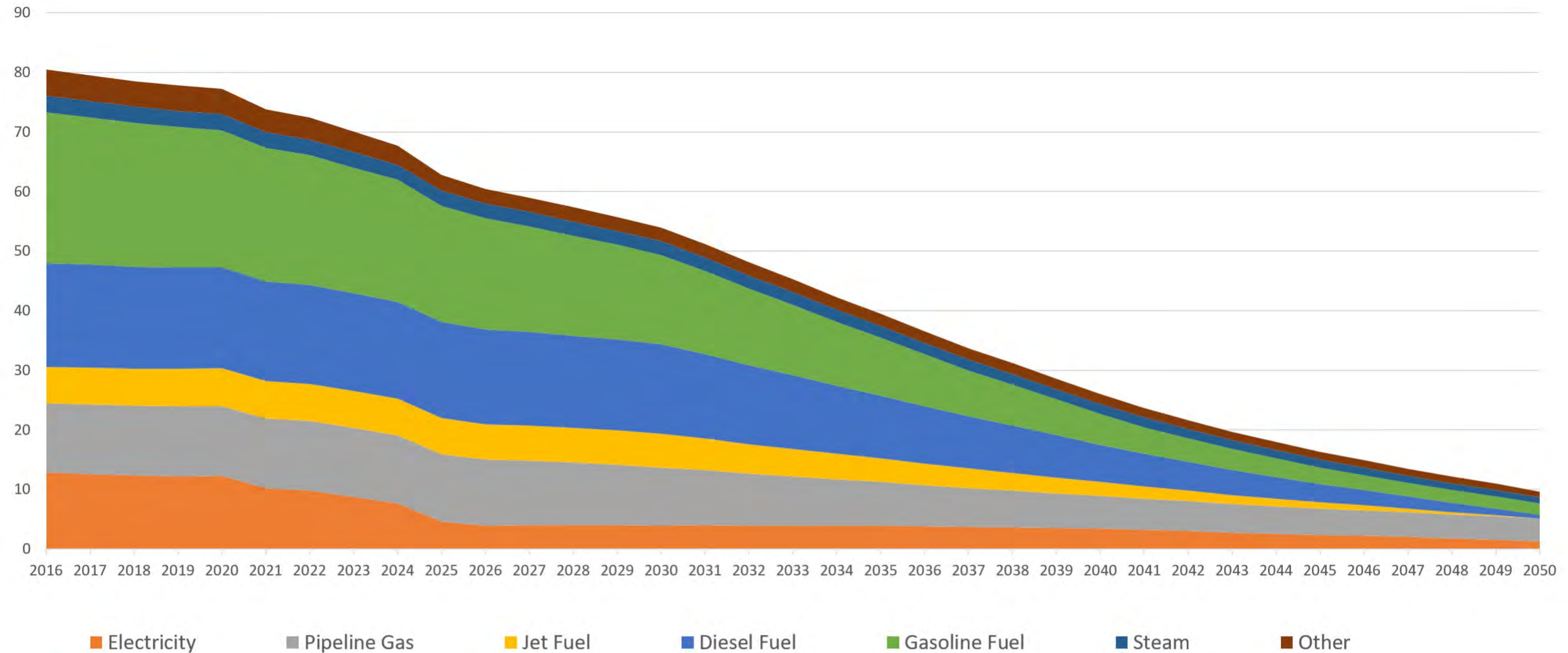
Washington's emissions: Then, Now, and in 2050



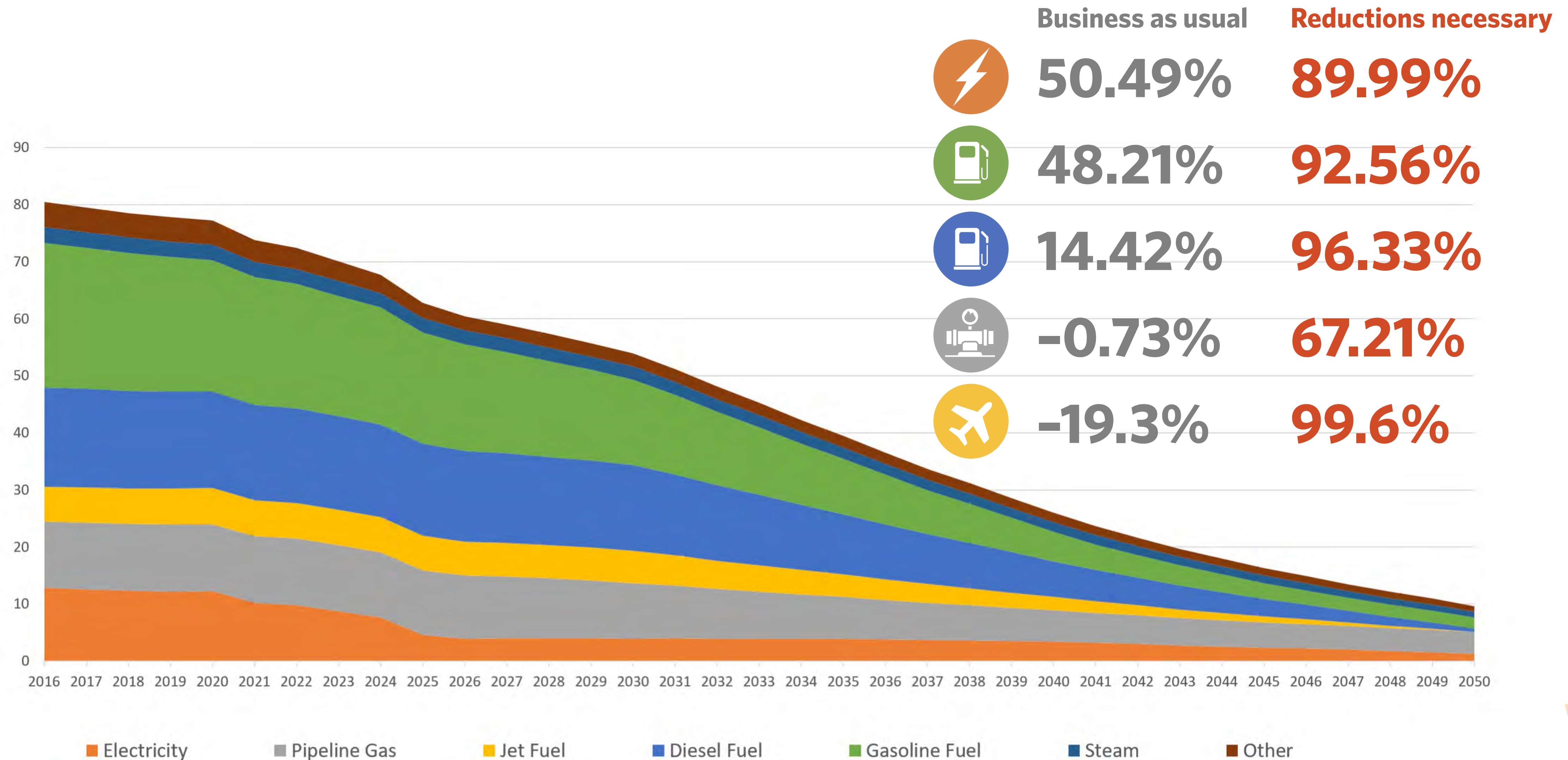
We're not on track



The Low Carbon Pathway



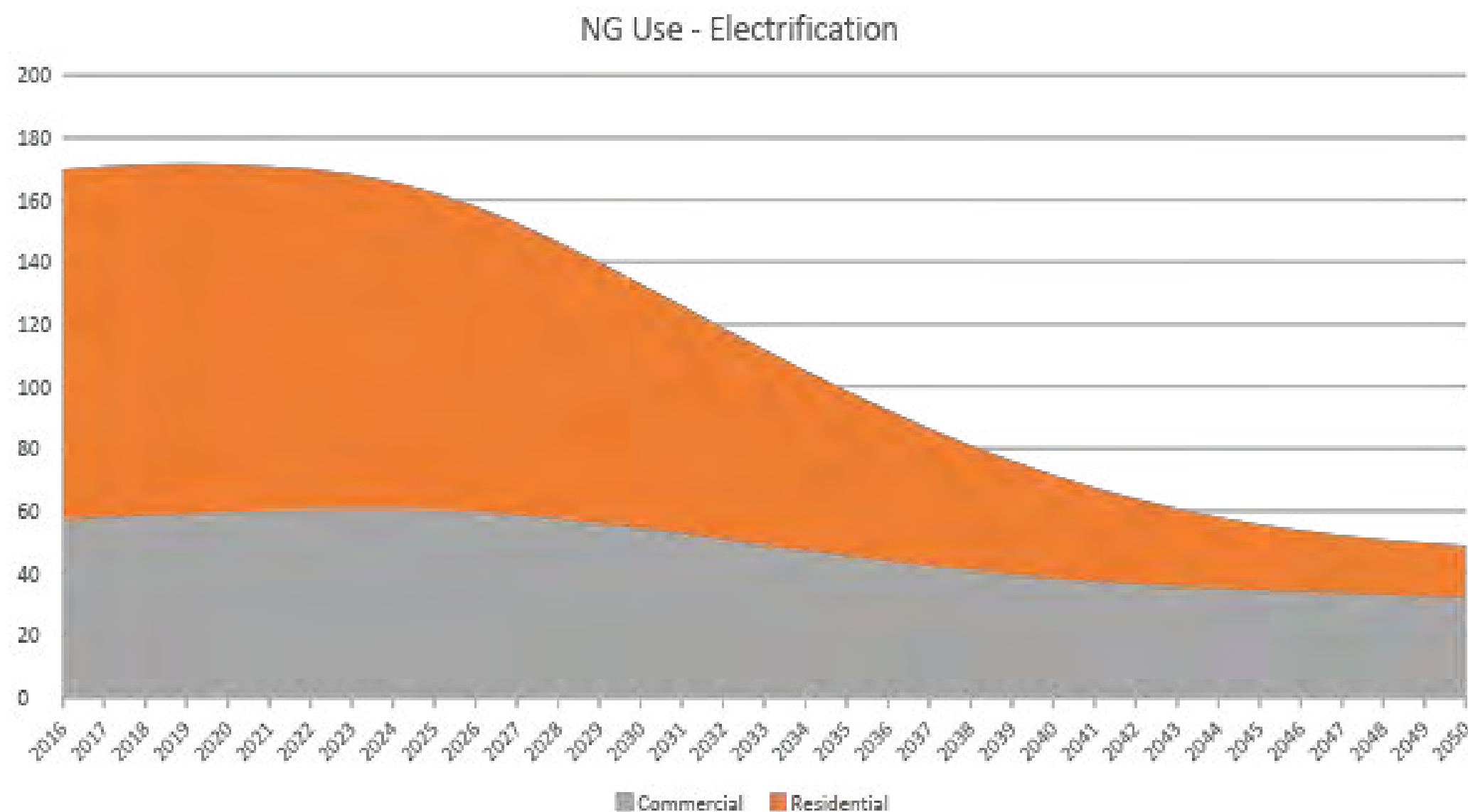
The Low Carbon Pathway: *How* do we get there?



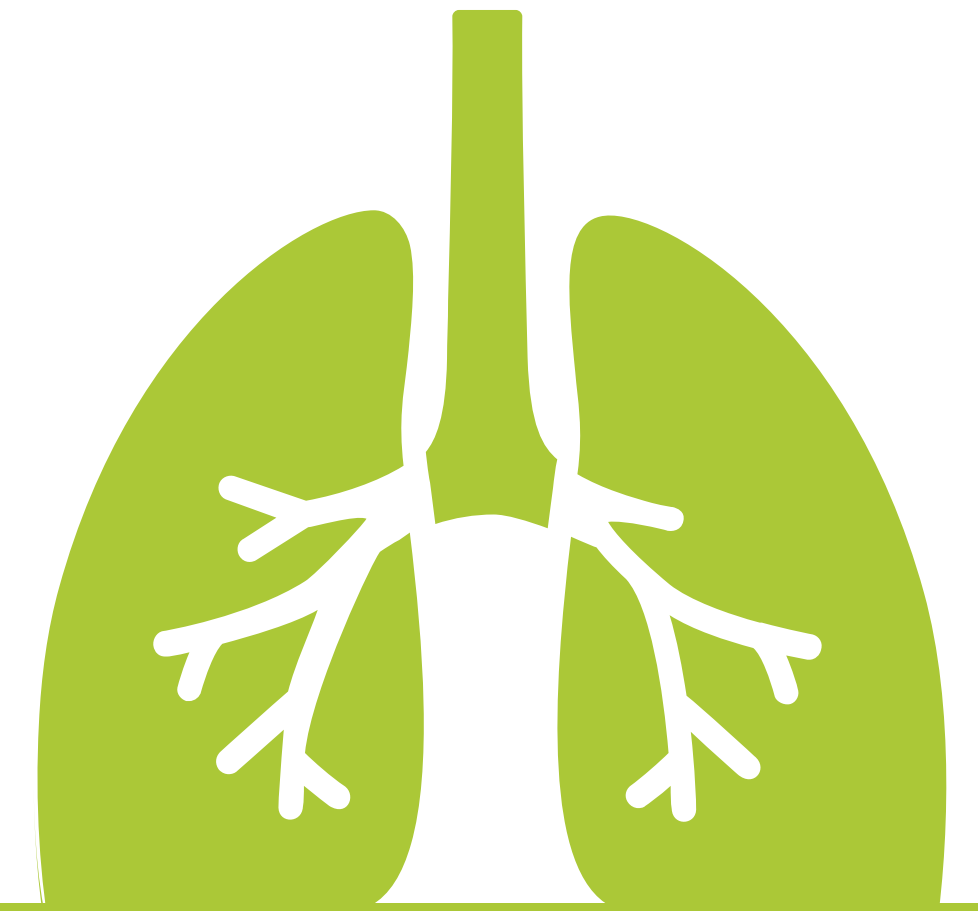
	Residential	Commercial
2016	112.85	56.98
2050	16.64	32.27
Reduction	-85%	-43%

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).



HEALTH



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 NEW ENGLAND
JOURNAL of MEDICINE

POINTS OF VIEW
What Is Liberty? Addressing
Undeserved Suffering in Health
Care

NEJM Catalyst eBook:
The Clinician Role in Health
Care Delivery and Innovation

PERSP
Why It
Matters

Perspective

The False Promise of Natural Gas

Philip J. Landrigan, M.D., Howard Frumkin, M.D., Dr.P.H., and Brita E. Lundberg, M.D.



<https://www.nejm.org/doi/full/10.1056/NEJMp1913663>

Mother Jones

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

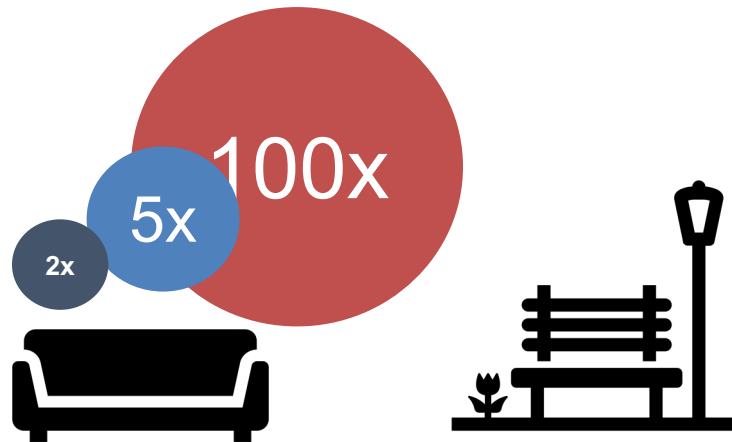


Indoor Air Quality is Often Worse than Outdoor Air Quality

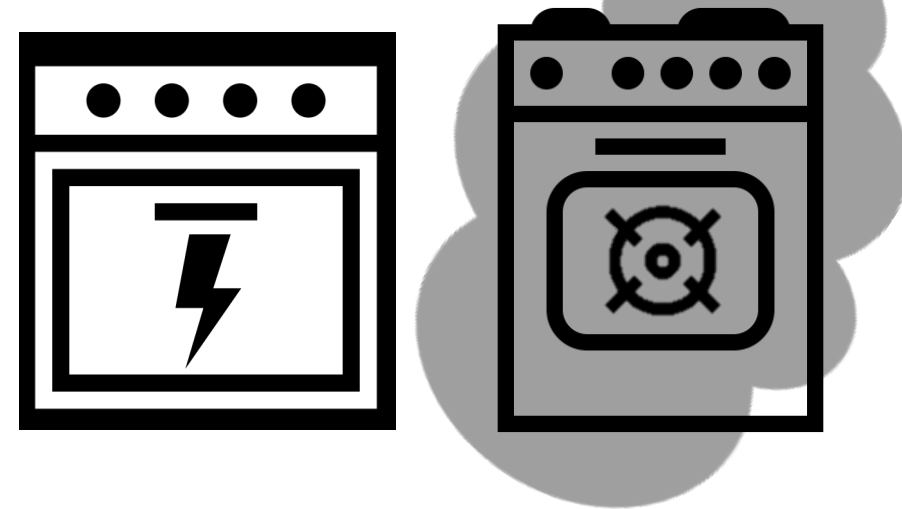
We spend up to **90%** of our time indoors



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



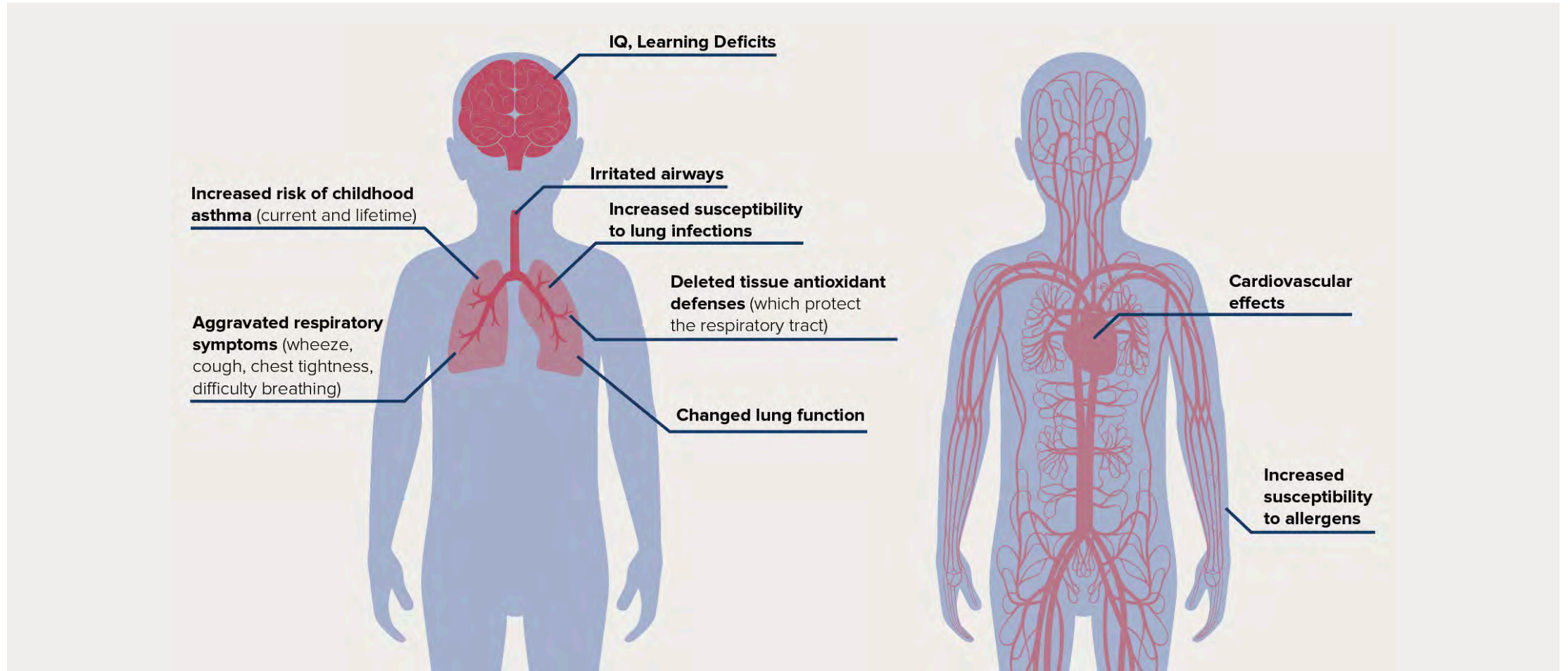
Indoor NO₂ Emissions from Gas Stoves Often Exceed Outdoor Standards

Outdoor Standards for NO ₂	1-hr average (ppb)
US National Standard (EPA)	100
Canadian National Standard	60
California State Standard	180
Indoor Guidelines for NO ₂	1-hr average (ppb)
Canada	90
World Health Organization	106

Measured NO ₂ Emissions from Gas Stoves	Peak (ppb)
Baking cake in oven	230
Roasting meat in oven	296
Frying bacon	104
Boiling water	184
Gas cooktop - no food	82–300
Gas oven - no food	130–546



Health Effects of NO₂ in Children May Include:



Lower-income Households May be at a Higher Risk of Exposure to Gas Stove Pollution

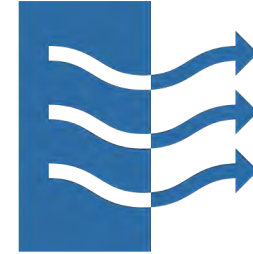
FACTORS CONTRIBUTING TO HIGHER LEVELS OF NO₂ IN HOMES:



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

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

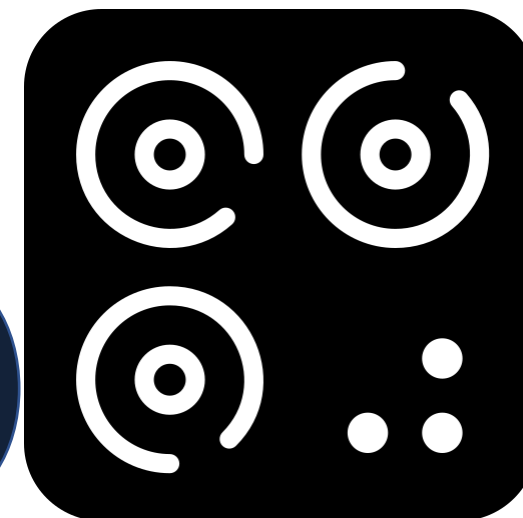
Cook on the back
burners



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

Try a plug-in
induction stove
(\$50)

Switch to an
electric/ induction
stove

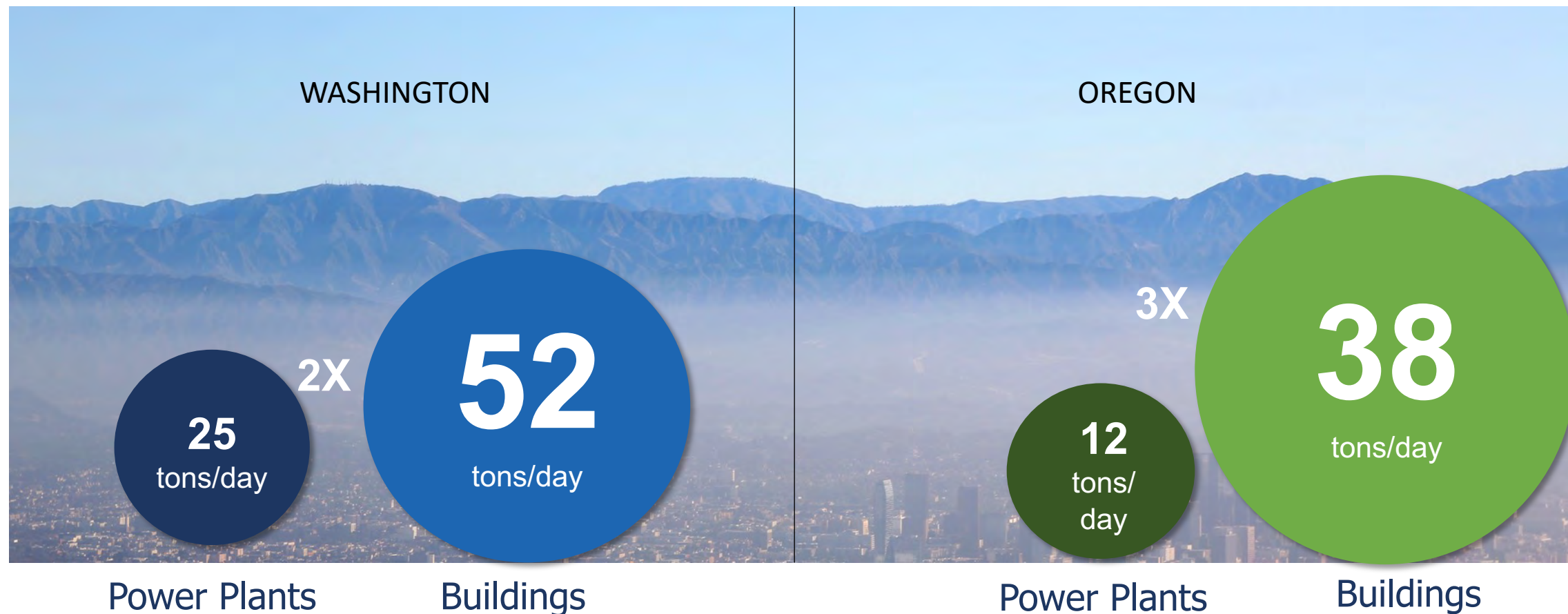




OUTDOOR AIR POLLUTION

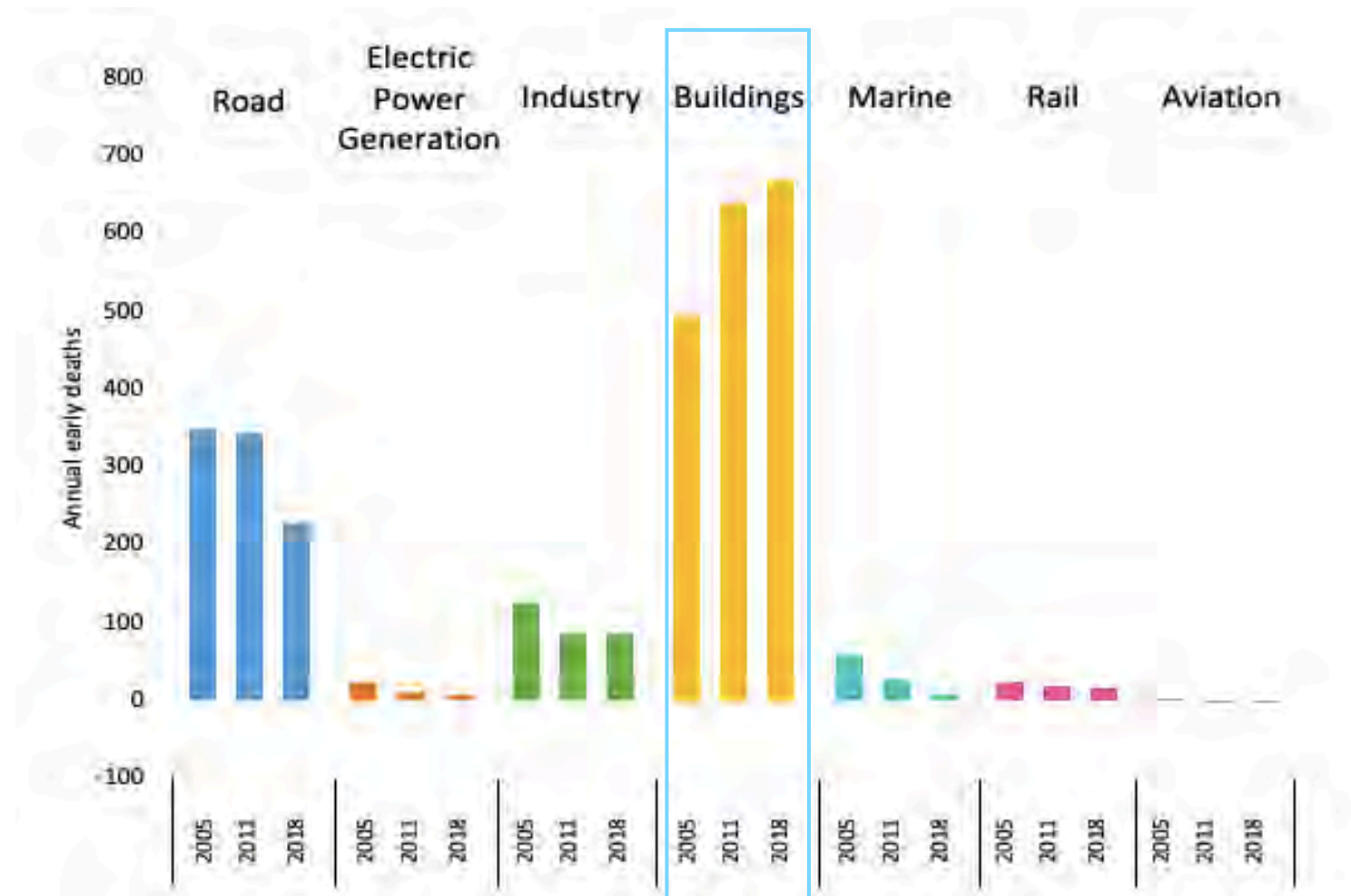
Burning fossil fuels in buildings generates more than two times as much as NO_x as power plants

Nitrogen Oxides (NO_x) in Washington and Oregon (2014)



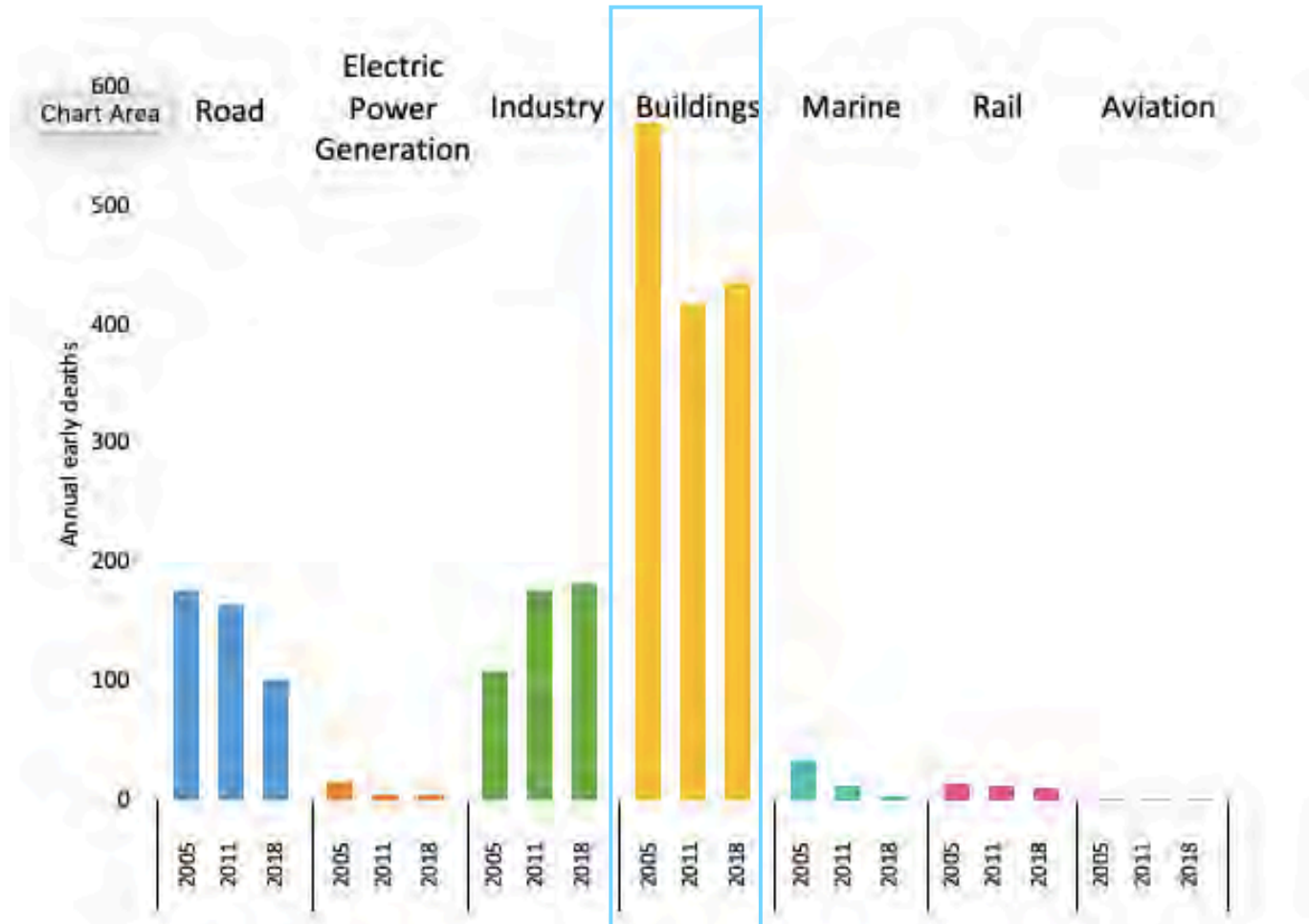
Buildings are the #1 Source of Pollution-Related Premature Deaths

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



Buildings are the #1 Source of Pollution-Related Premature Deaths

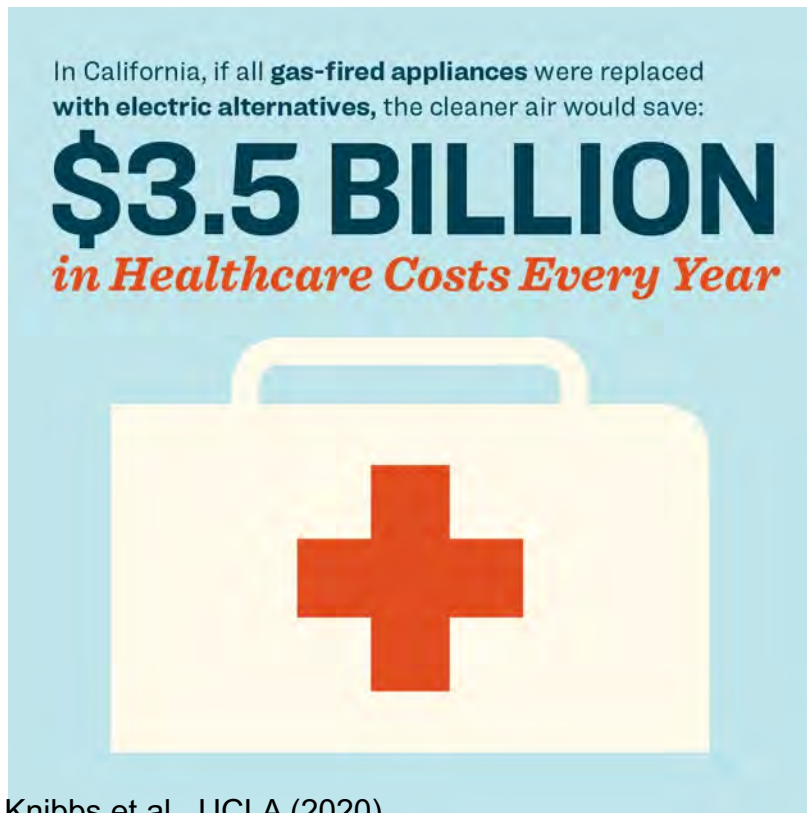
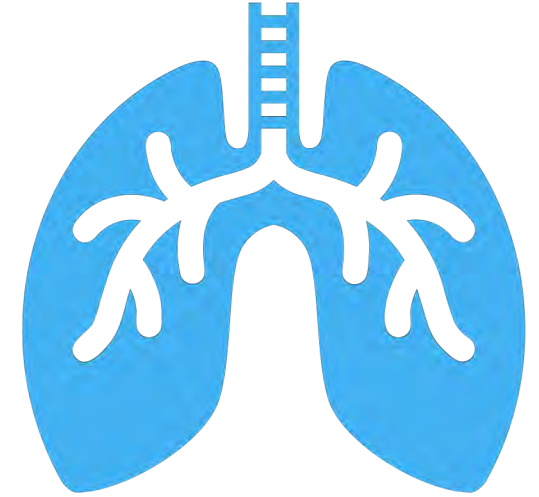
OREGON PREMATURE DEATHS FROM PM2.5 & OZONE EMISSIONS FROM COMBUSTION SOURCES (BY SECTOR)



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.



Average cost of each asthma hospitalization:

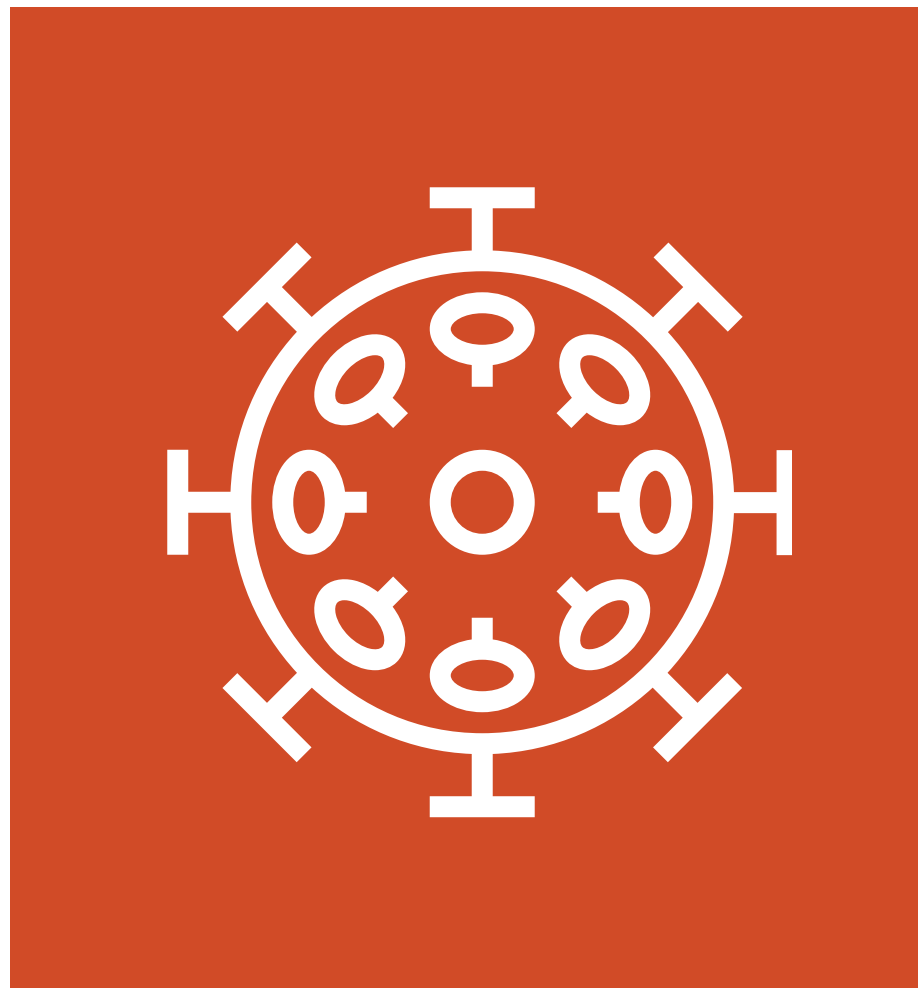
\$33,000 (2010)

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.>



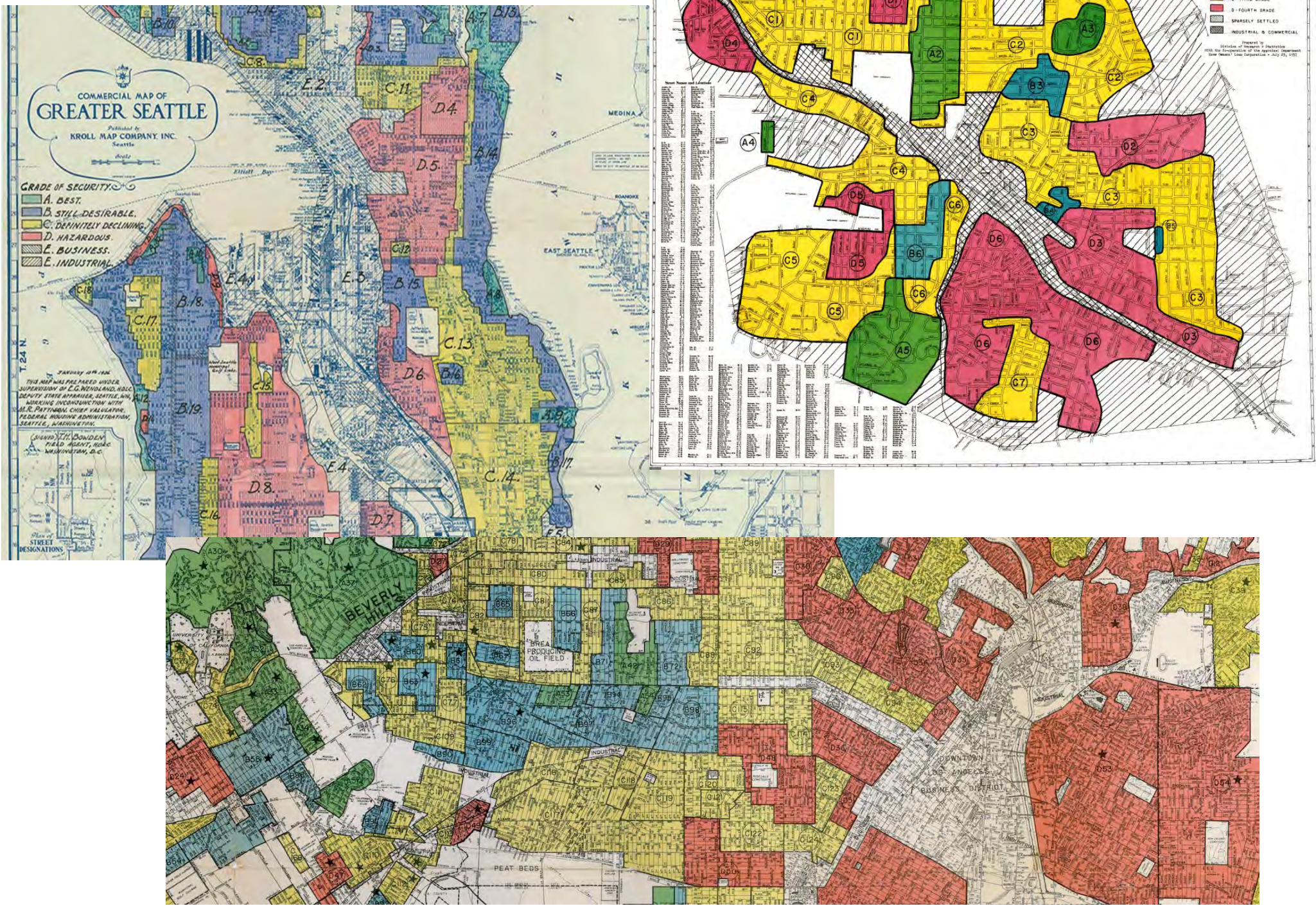
Air quality and COVID-19

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 PM_{2.5} 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.



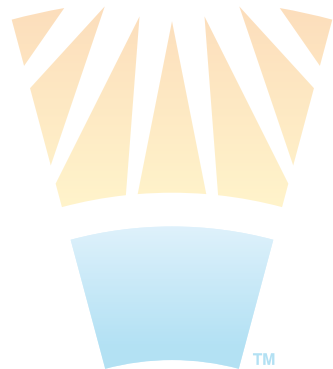
“The burden of air pollution is not equally shared.”

American Lung Association's 2020 “State of the Air” Report



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.





Safety Impacts

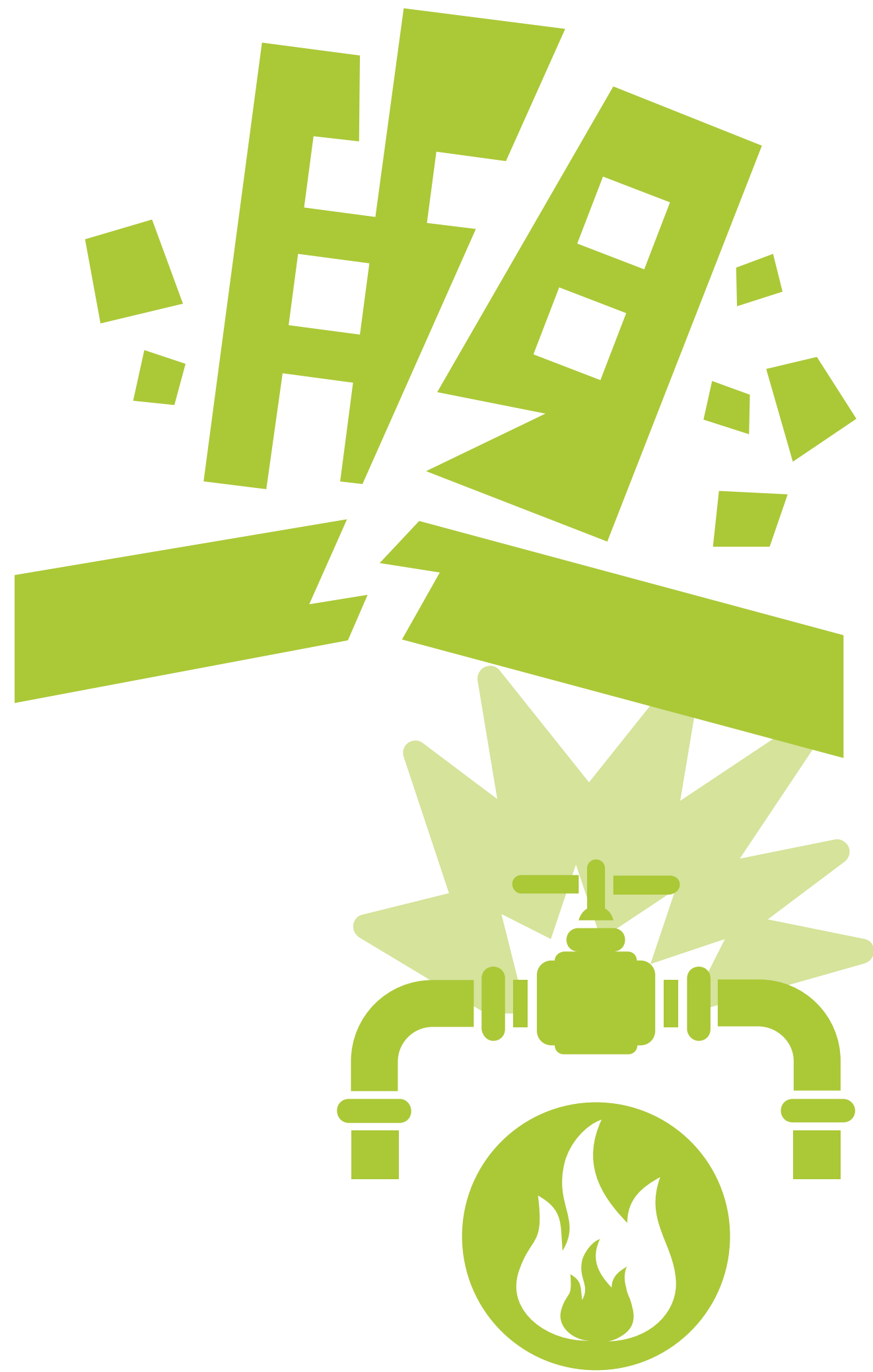
Pipeline explosions and gas leaks pose a risk to our communities nationwide, but also close to home. Recent Seattle neighborhood instances of the Greenwood explosion in 2016 and gas leak in Ballard in 2020, as well as the daily volume of 911 calls reporting “natural gas odor” or “gas leak” continue to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

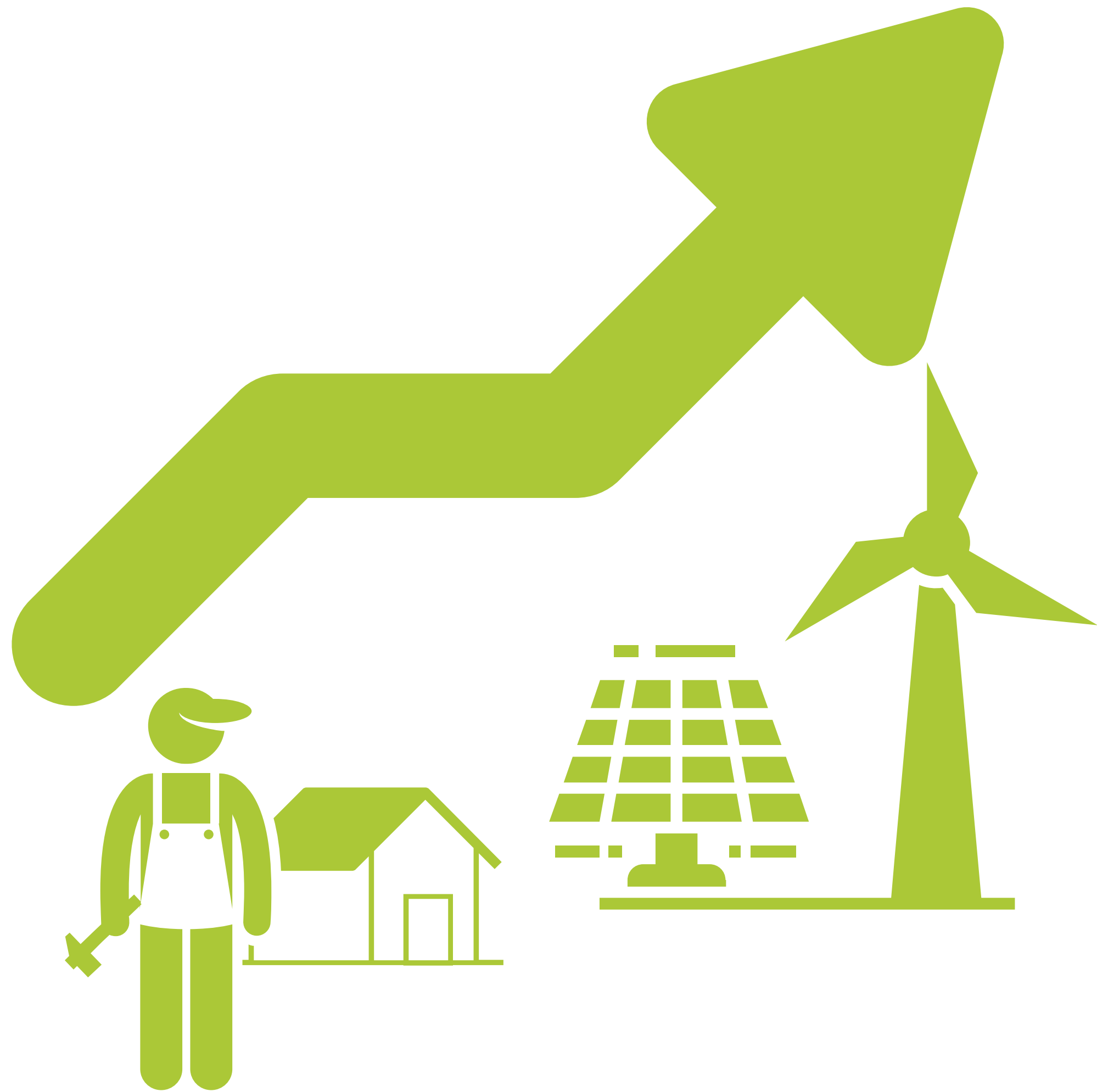
Earthquake risk makes Washington St particularly vulnerable because highly pressurized gas pipelines run a high risk of exploding during earthquakes and causing fires and immediate danger. All-electric buildings are more resilient following natural disasters as electricity can be restored more quickly than repairs can be made to ruptured gas lines.



JOB\$ & \$\$\$

**What does this mean
for my *community*?**



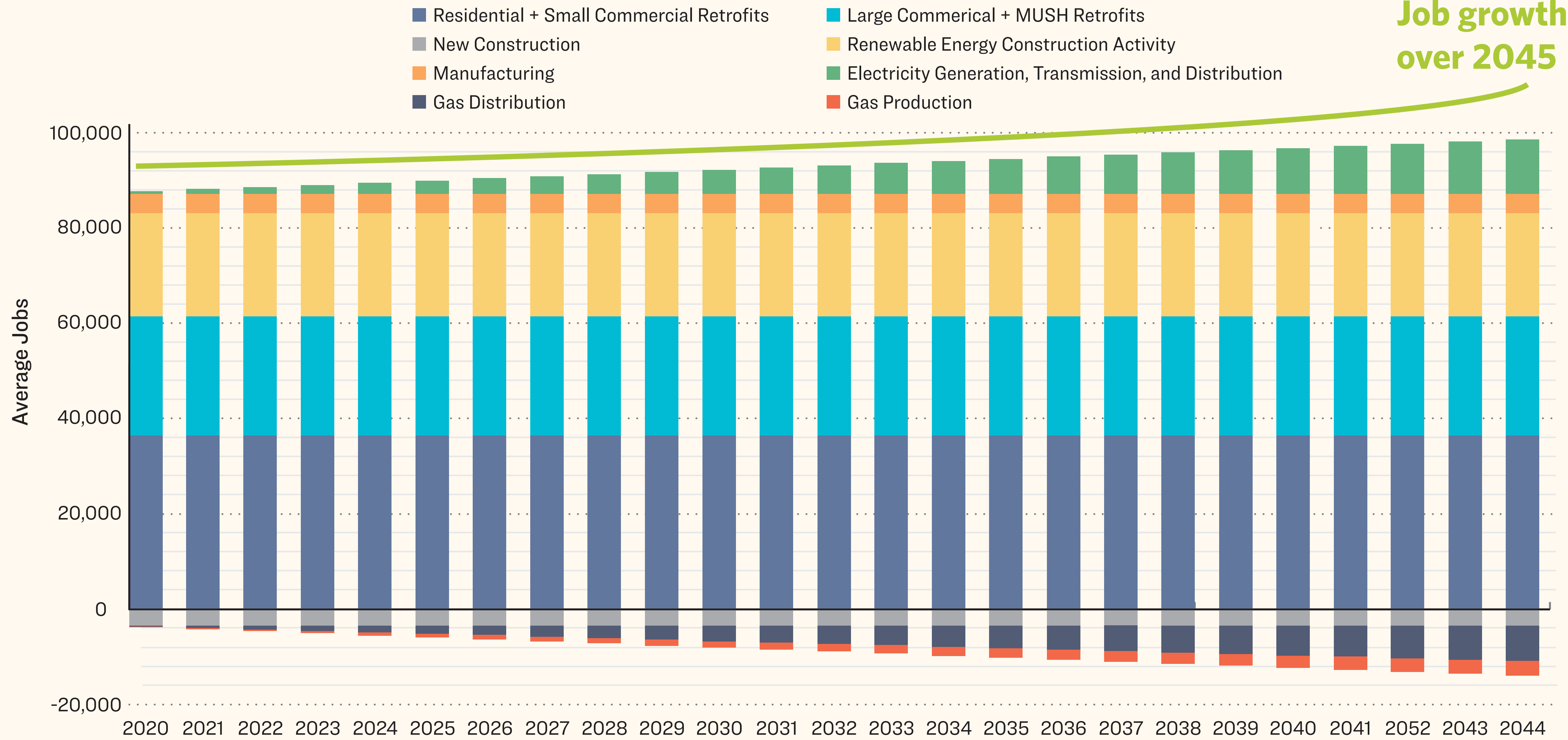


Positive gain for WA St economy

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.



Job growth over 2045





How do we build all-electric?



Suraj Lobo

Progressive Comfort Solutions

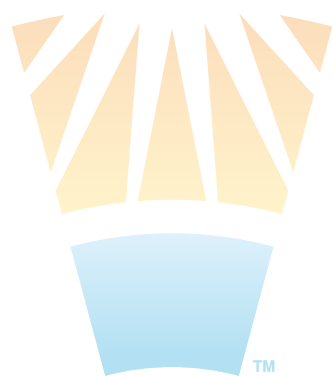
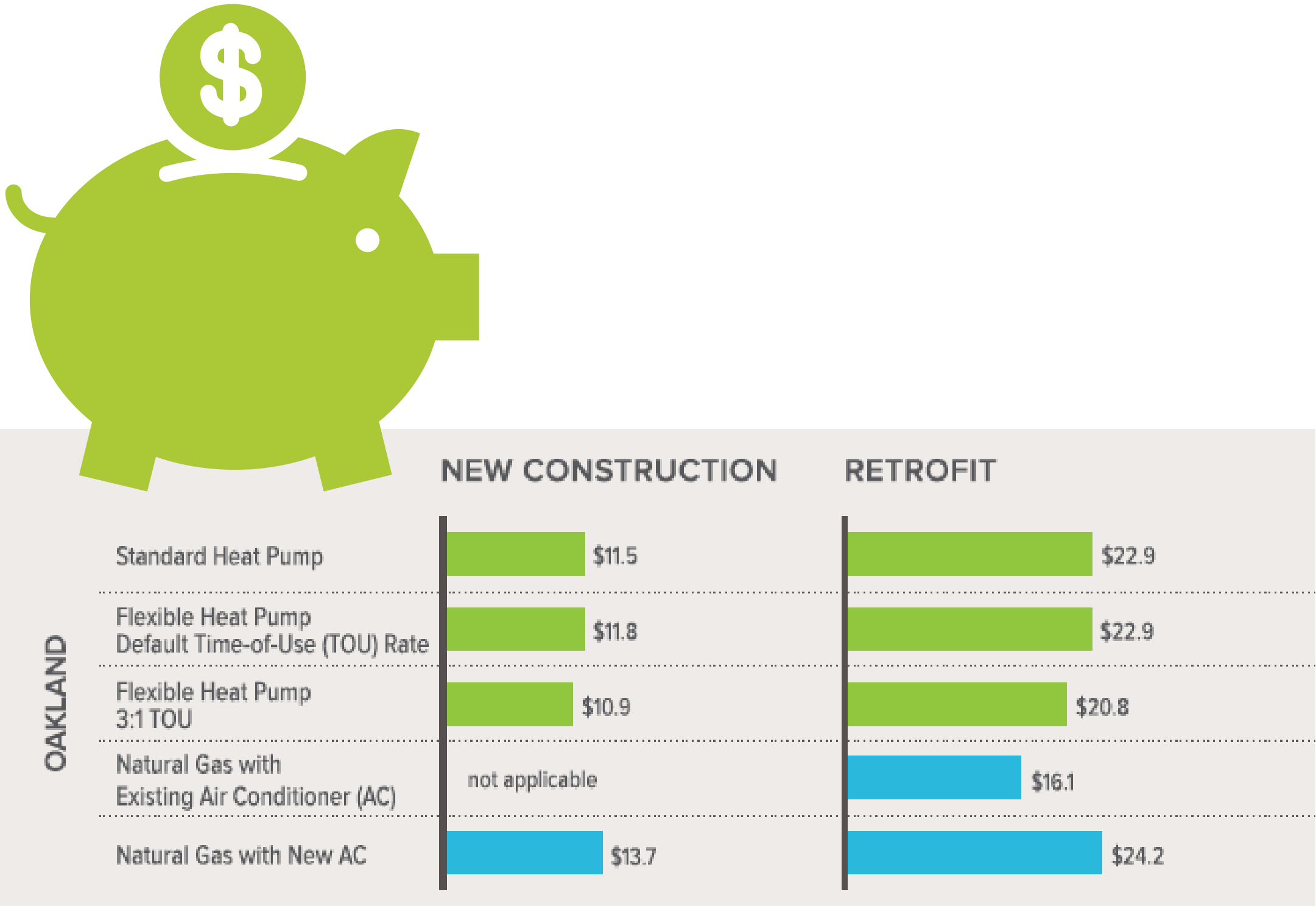
"One of my favorite things to do... Demo'ing a fossil fuel gas furnace. We installed a Mitsubishi 3 zone ductless mini-split system to this 2 bedroom home in North Seattle. And now they are fossil fuel free!"



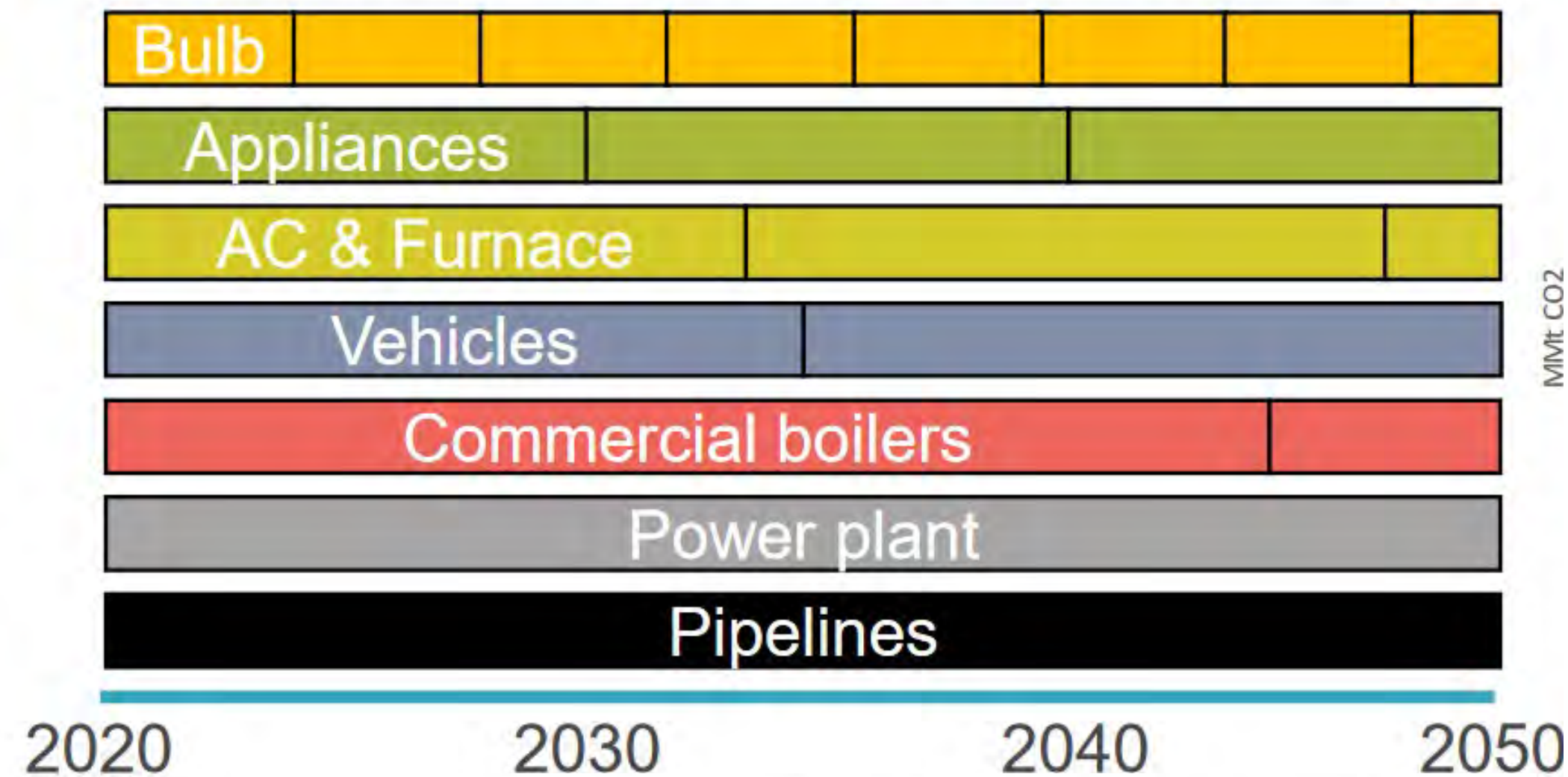


Cost savings are part of the plan

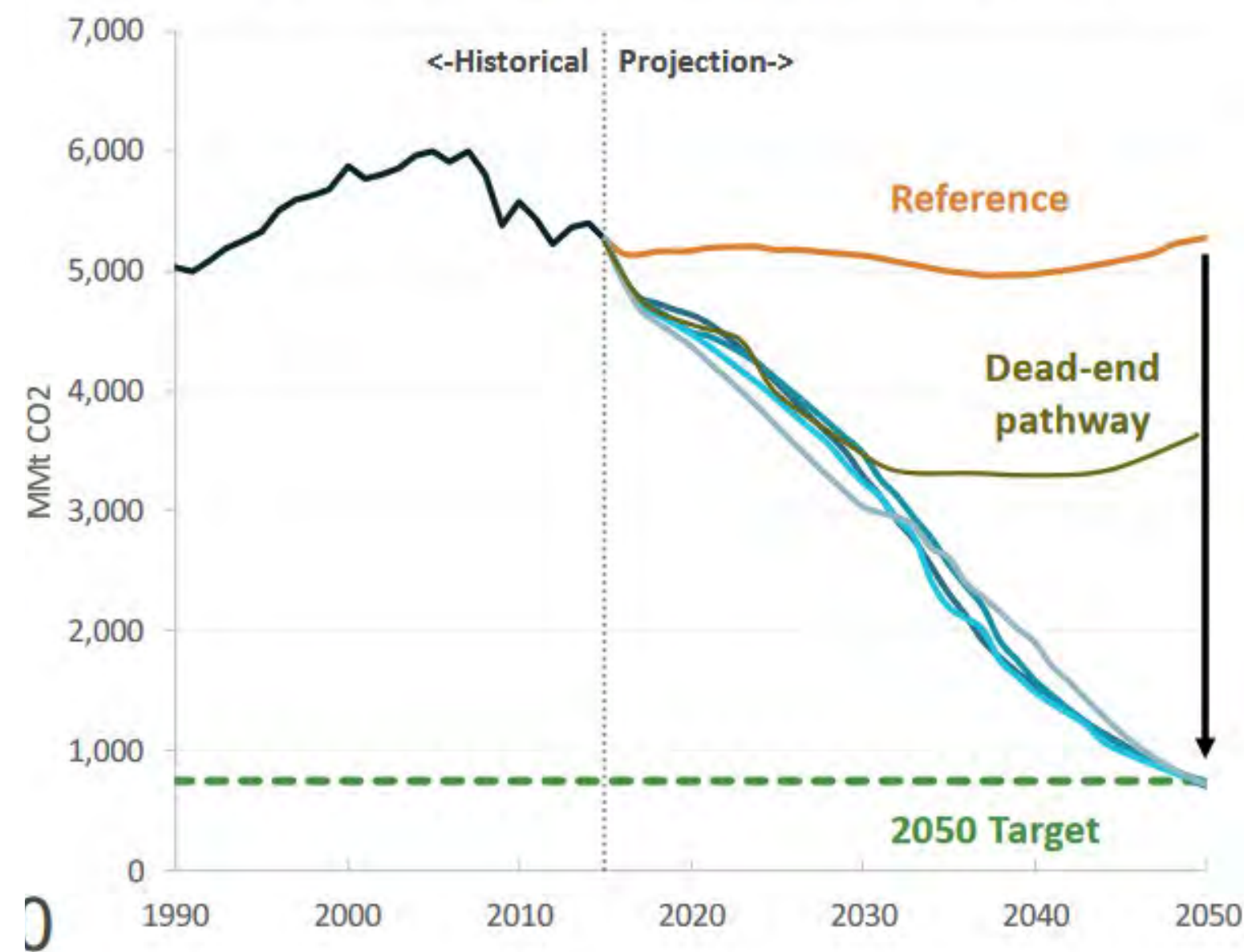
Upfront costs of electric heating systems are \$1,500 lower than gas. Life cycle costs of electric are comparable or lower than gas plus electric. And WA's electricity costs are lower than CA's! Additionally, utility customers will benefit from more stable energy prices as they reduce dependence on volatile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



Stock replacement count before mid-century



U.S. Energy-related CO₂ Emissions

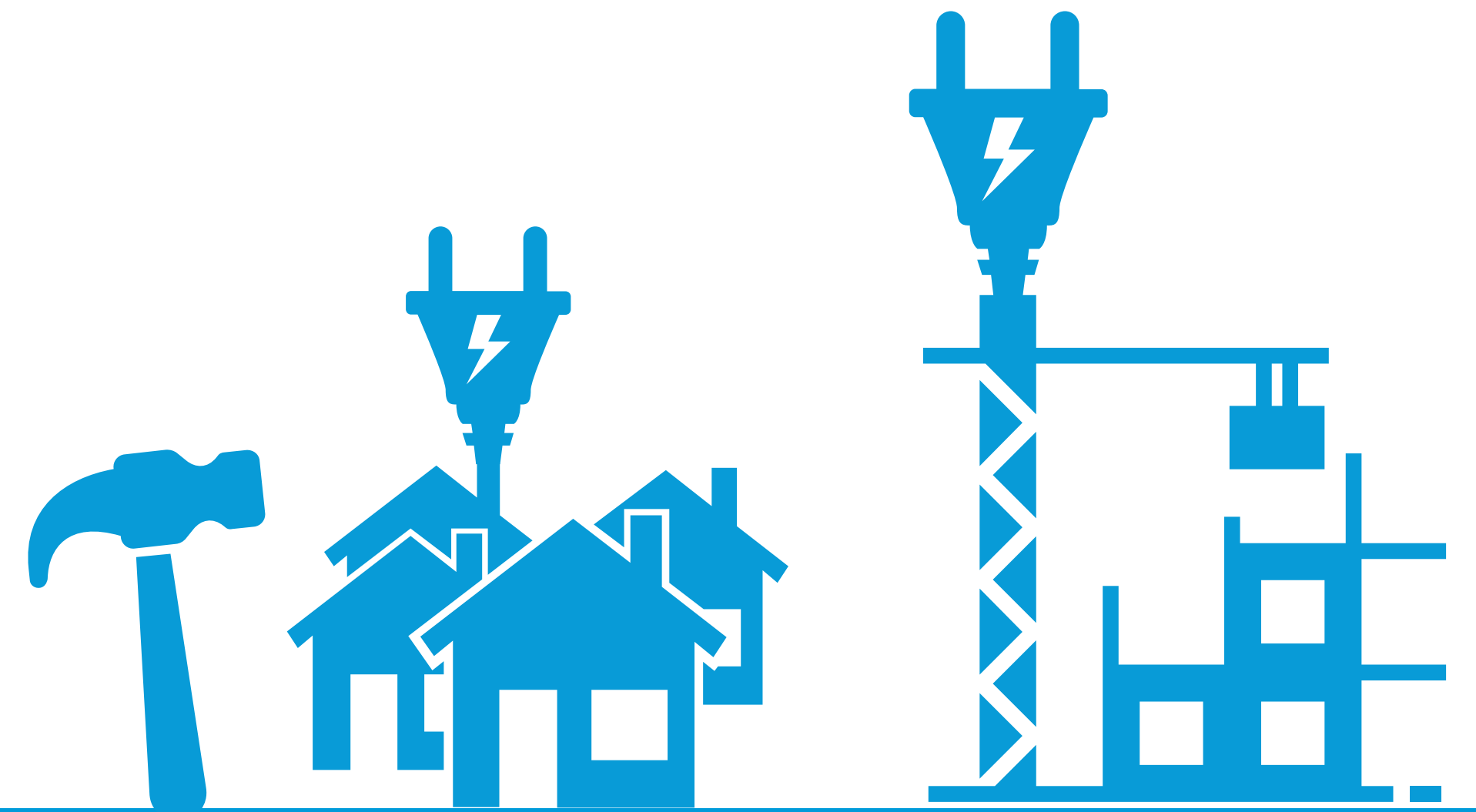


Less gas now, lower costs later

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

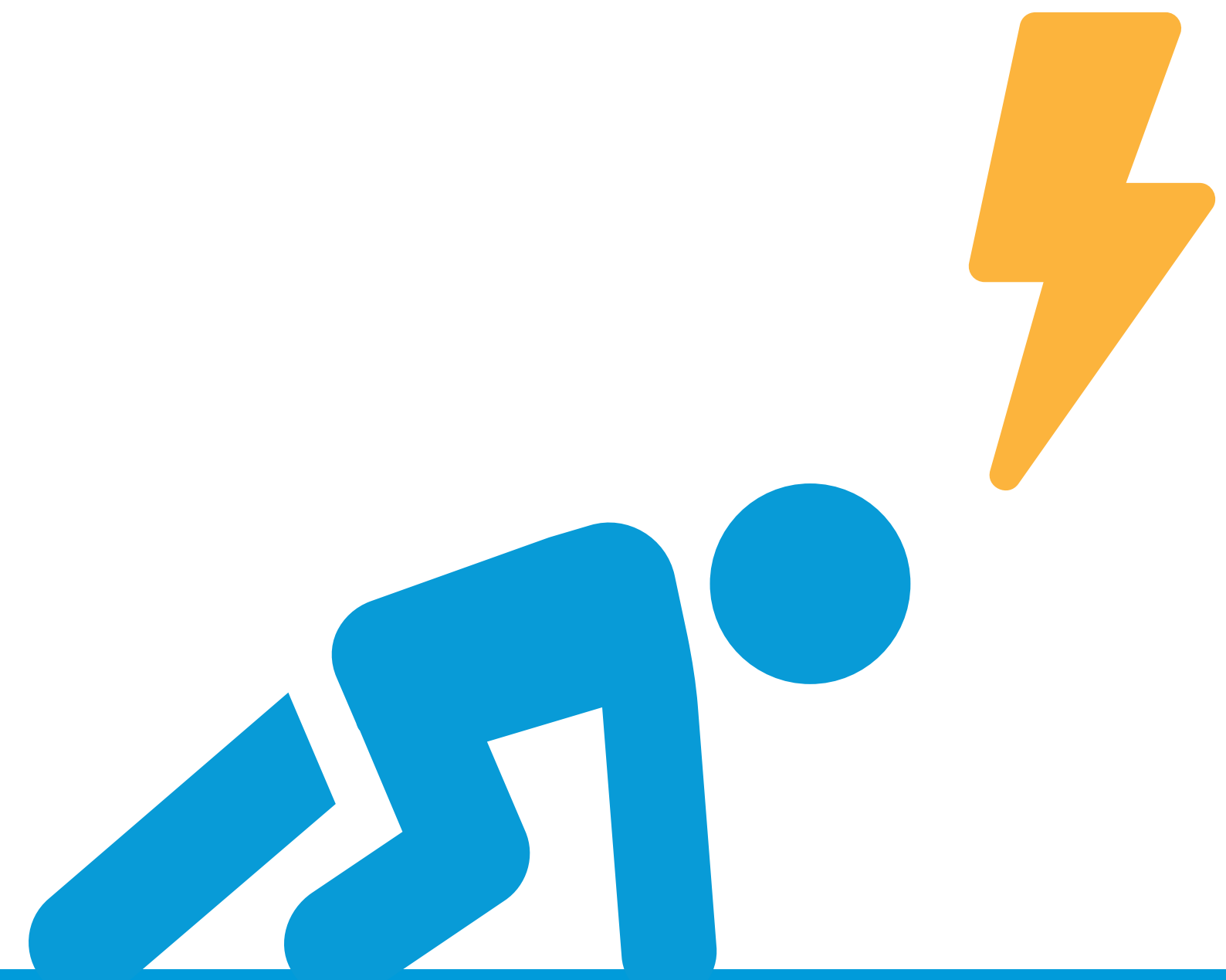
Change state statutes to support beneficial electrification so that utilities can support customers who want to switch to electric sources

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

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Climate change

Berkeley became first US city to ban natural gas. Here's what that may mean for the future

The California city on Tuesday voted to ban natural gas hook-ups in new buildings in a historic move

Susie C
Tue 23 Jul 2

CBSN Bay Area
WATCH NOW

SJ Black Lives Matter Mural Concerns

72°

San Jose Approves Ban Of Natural Gas In New Construction Projects

By Kiet DoSeptember 17, 2019 at 9:41 pmFiled Under: Construction Projects, Electric Buildings, Greenhouse Gas, natural gas ban, San Jose News



Sam Liccardo
San Jose Mayor

5:08 PM
KPIX

08-11-20 | 3:30 PM | WORLD CHANGING IDEAS

What will it take for cities to get rid of natural gas?

As cities' old gas infrastructure starts failing (with often deadly consequences), the proposed solution is often repairs. But a transition to a clean economy involves eliminating natural gas, so why not start now?



Bloomberg Green

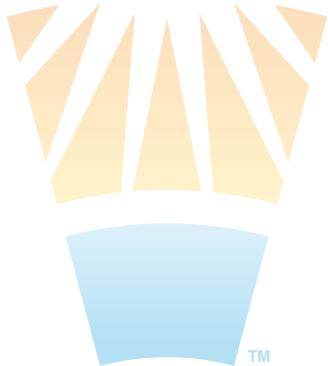


Photo

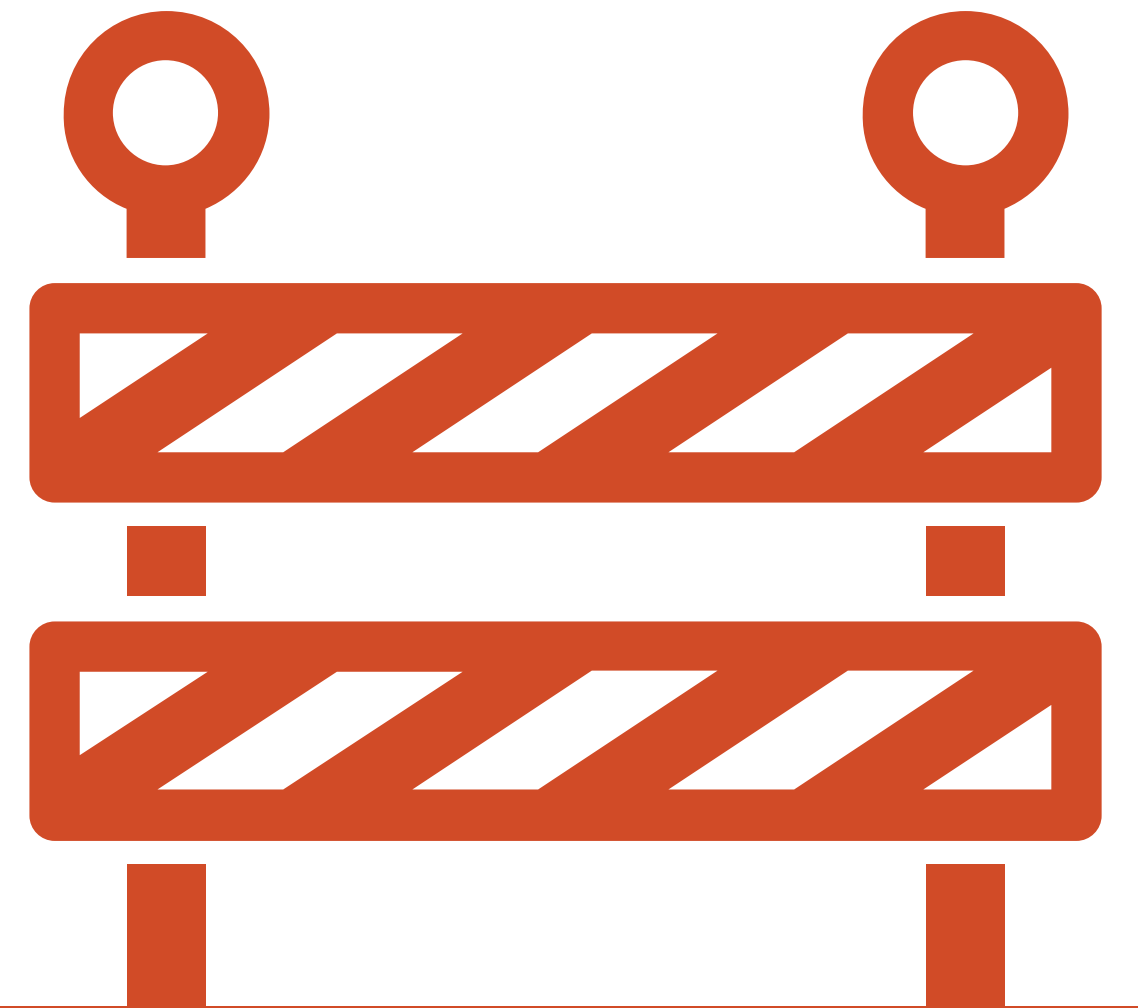
Politics

New Jersey Sets Goal to Cut Natural Gas Use 80% by 2050

By Chris Martin
January 27, 2020, 10:42 AM PST



**The opposition has
already started too**



Green-washing gas

Environment | Health | Local News | Local Politics | Northwest | Puget Sound

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

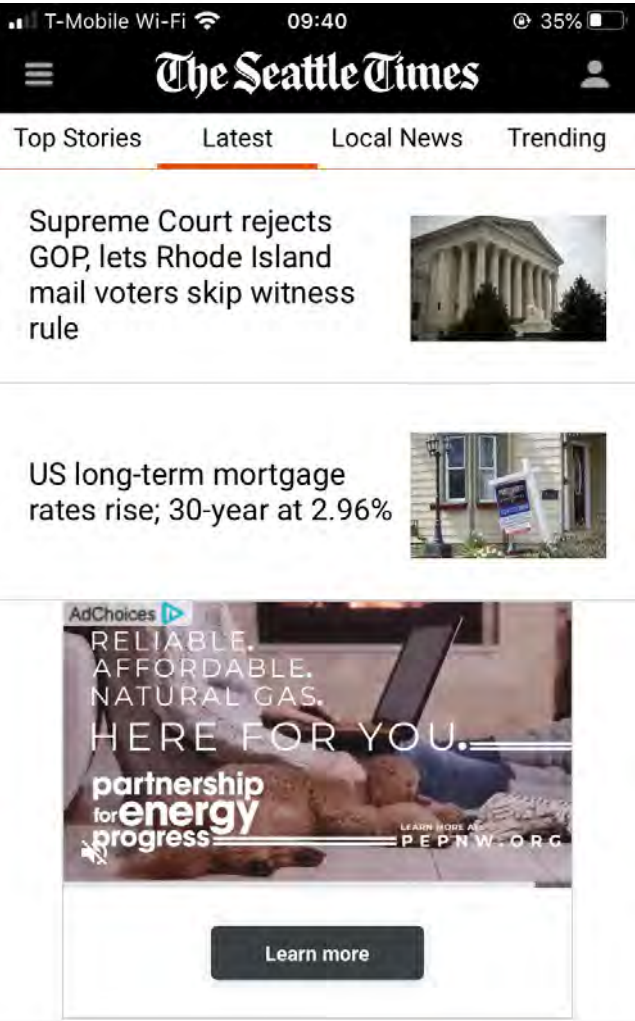
Dec. 22, 2019 at 6:00 am | Updated Dec. 23, 2019 at 4:17 pm



1 of 3 | Sam Lai’s Seattle development company builds all-electric housing. This new townhouse complex in Queen Anne has an electric heat-pump system (the pump’s head is... More

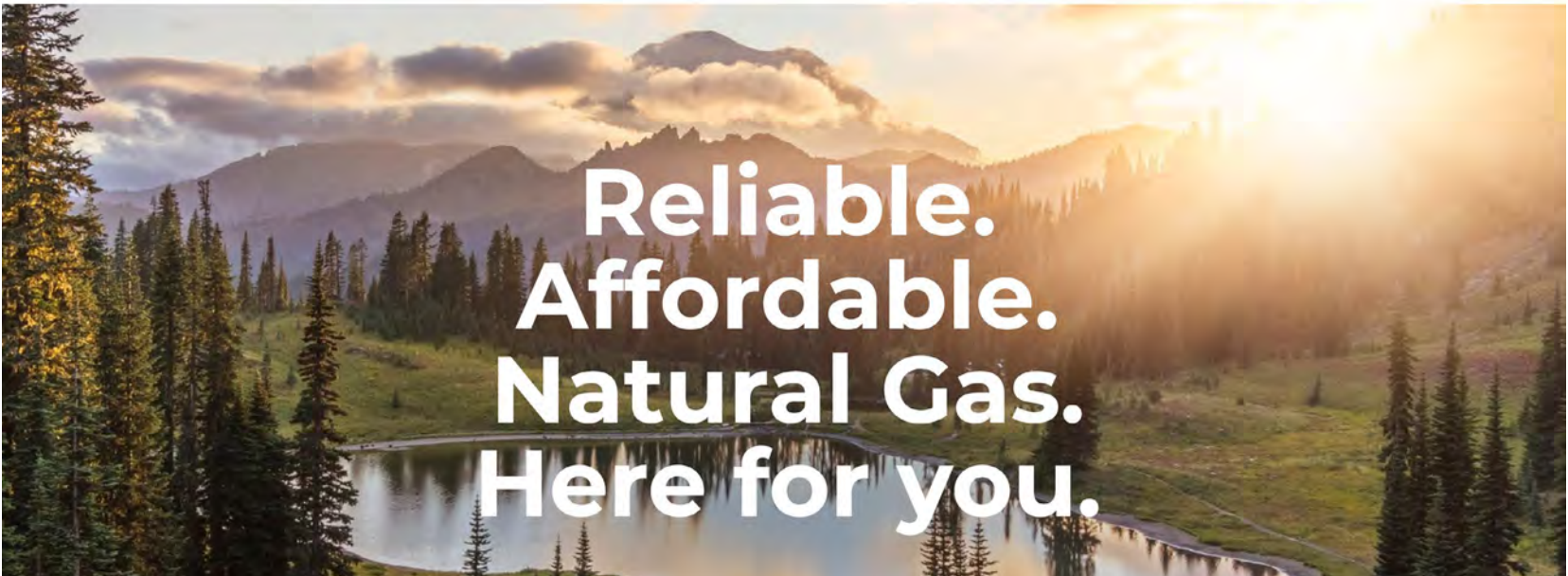
By Hal Bernton and Daniel Beekman
Seattle Times staff reporters

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-

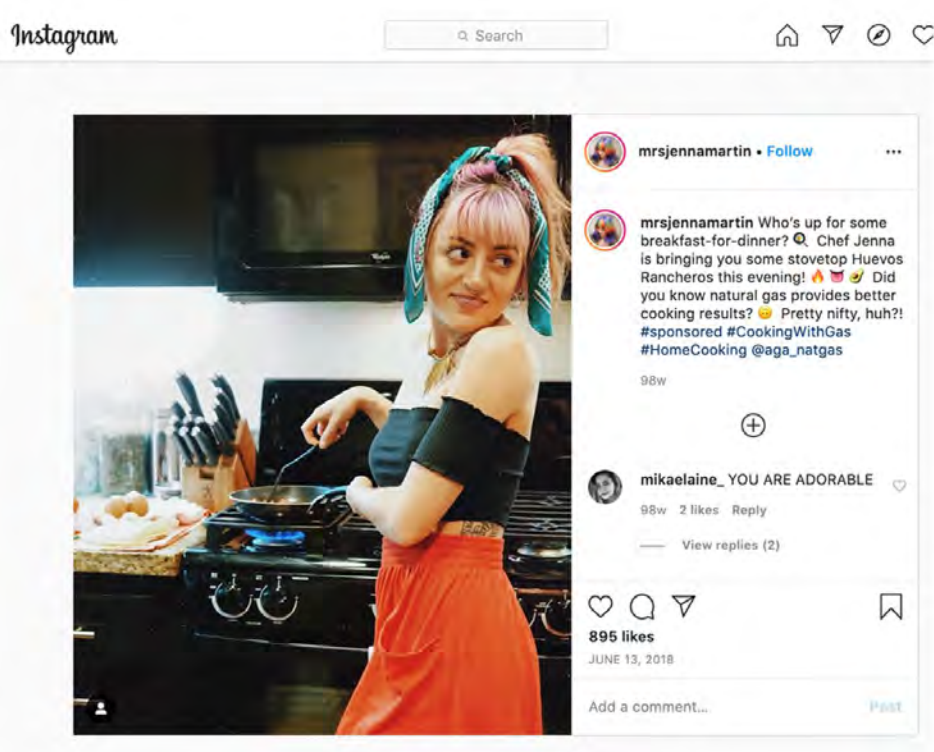


AP FACT CHECK: Trump payroll tax cut is Social

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ENVIRONMENT



theStranger

THINGS TO READ • THINGS TO DO •

NEWS • ENVIRO

Puget Sound Energy Wants Your Kids to Love Natural Gas

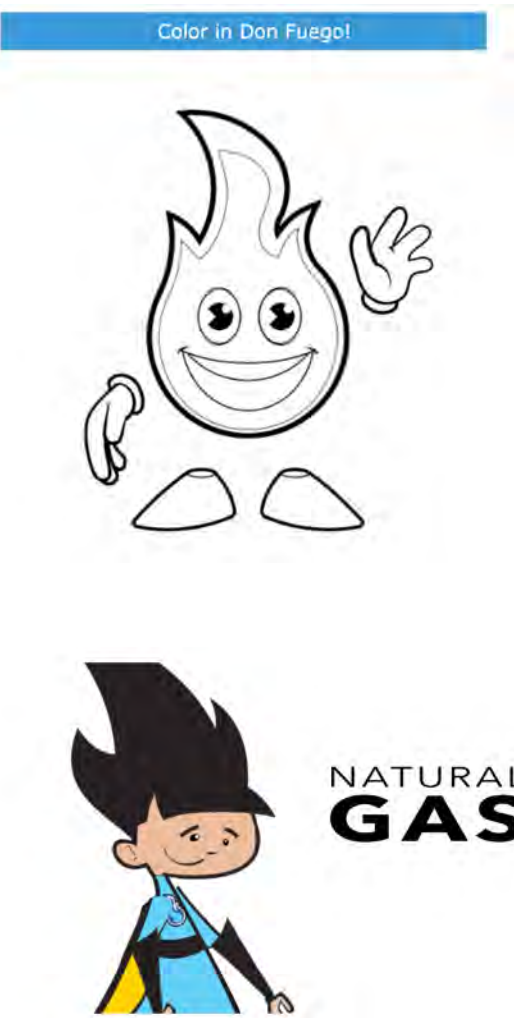
by Nathalie Graham • Jun 26, 2020 at 4:30 pm



Puget Sound Energy
@PSETalk

Color your way through Natural Gas Town and learn how natural gas provides energy to your neighborhood! ms.spr.ly/6017TYh1F

9:31am • 23 Jun 2020 • Sprinklr Publishing



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!

