
Austin Climate Equity Plan & Natural Gas for Cooking

Office of Sustainability, City of Austin

January 2023

Original Inquiry

Regarding a resolution passed by the Resource Management Commission, then also the Joint Sustainability Committee:

NOW, THEREFORE, BE IT RESOLVED that the Joint Sustainability Commission recommends that the Austin City Council make the following modifications to the Texas Gas Service conservation tariff for the budget year 2023 and thereafter:

1. Exclude rebates for natural gas equipment in new construction; and 2. Exclude rebates in existing residential buildings for installation of a new gas stub for clothes dryers; and 3. Up to the point that such rebate programs are cost effective, redirect funds from the eliminated appliance rebate programs to rebates for duct sealing, ceiling insulation, water conservation measures and other weatherization measures; 4. Encourage Texas Gas Service to seek cooperation with and co-funding from local water utilities for gas conservation programs focused on water-saving technologies such as low-flow showerheads, aerators, and commercial dish rinsers.

Our Assessment:

We have a Climate Plan with a goal of net-zero emissions by 2040, so a logical action is to not incentivize the use of fossil fuels.

Agenda

- **Background**

- Climate change, natural gas
- Equity, indoor air quality, and safety

- **Alternatives**

- Technologies
- Costs and benefits
- Restaurants and induction

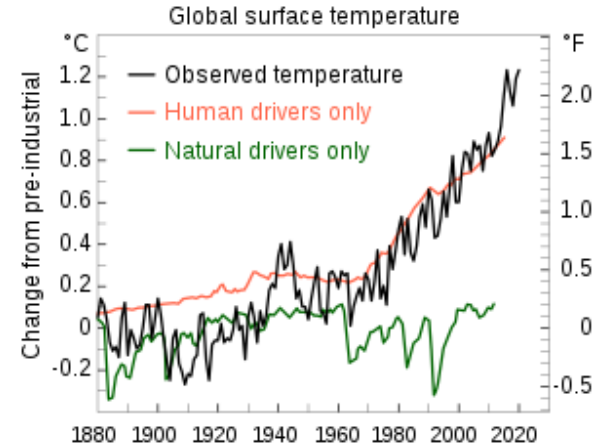
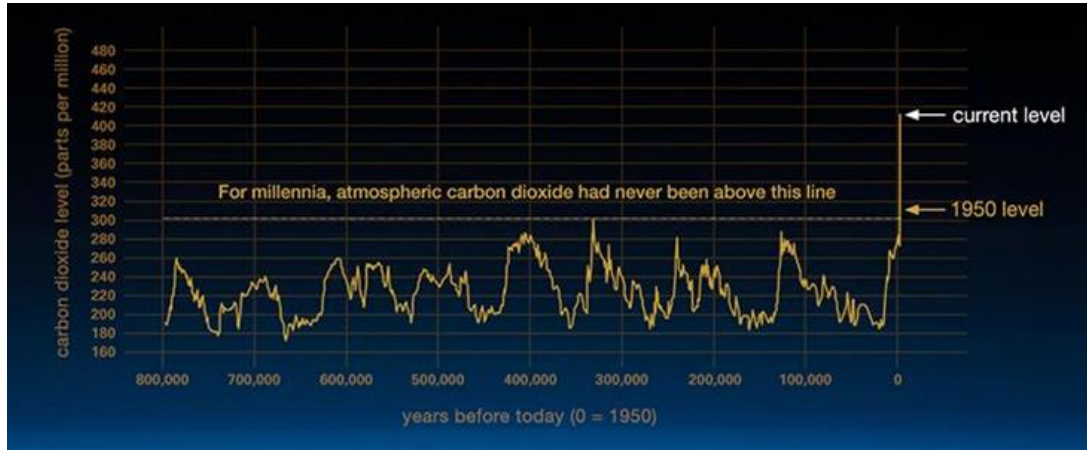
- **Ways Forward**

Executive Summary

- Burning natural gas in buildings is bad for occupants and the environment. **We need to equitably phase out the use of fossil fuels**, which is not a simple or easy process.
- To get to zero GHG emissions, all sectors need to contribute reductions. Options to reduce emissions from natural gas include: **renewable natural gas, leak reduction, energy efficiency, and electrification.**
- **There is no “gas ban” in Austin.** There are 2030 goals for net-zero carbon buildings and to reduce emissions by 30% from the natural gas sector.
 - Existing buildings with gas connections and equipment will likely use them for the foreseeable future.
 - A ban on gas connections has actually [been banned by the State of Texas](#).
- Electrification of some equipment in new buildings is cost effective now, achieving equitable solutions in existing buildings will require **incentives, engagement, and a longer ramp.**

Background

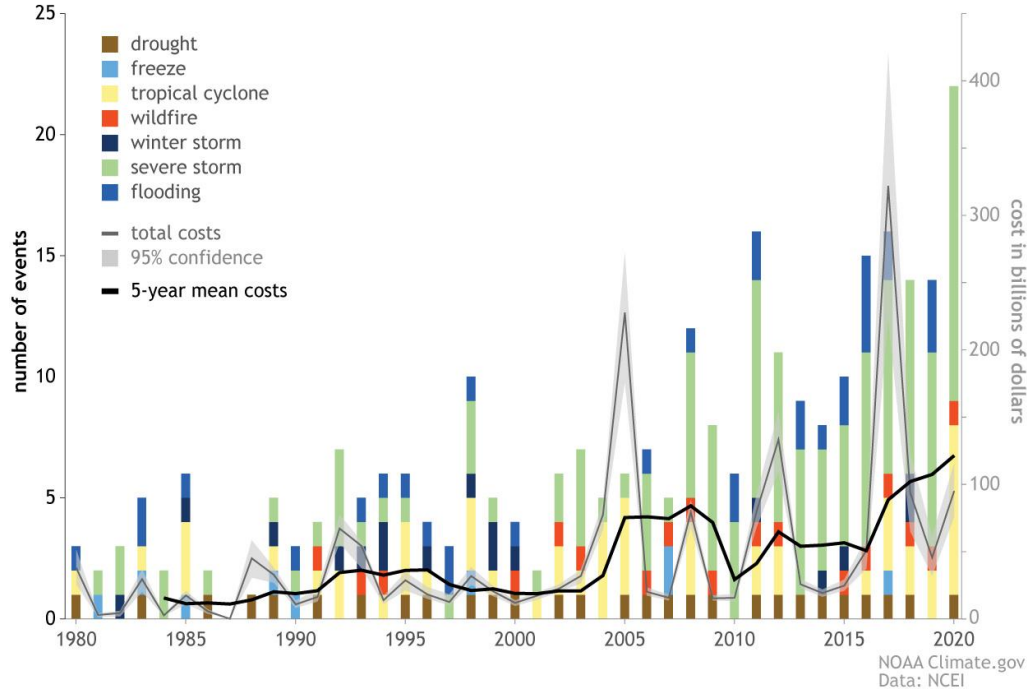
What is Causing Climate Change?



- The buildup of CO₂ is caused by burning Fossil Fuels (Coal, Oil, and Natural Gas)
- CO₂ is a greenhouse gas, which means it traps heat in the atmosphere

What's the Cost of Climate Change?

Billion-dollar disasters and costs (1980-2020)

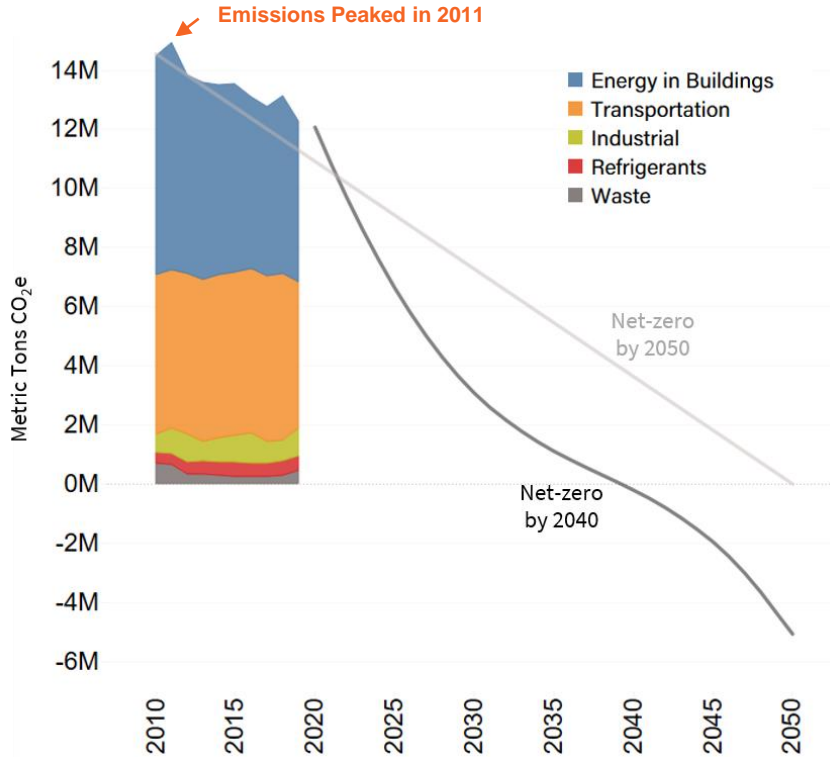


We're spending billions of dollars a year on weather-related disasters fueled by emissions from burning fossil fuels.

<https://www.climate.gov/news-features/blogs/beyond-data/2020-us-billion-dollar-weather-and-climate-disasters-historical>



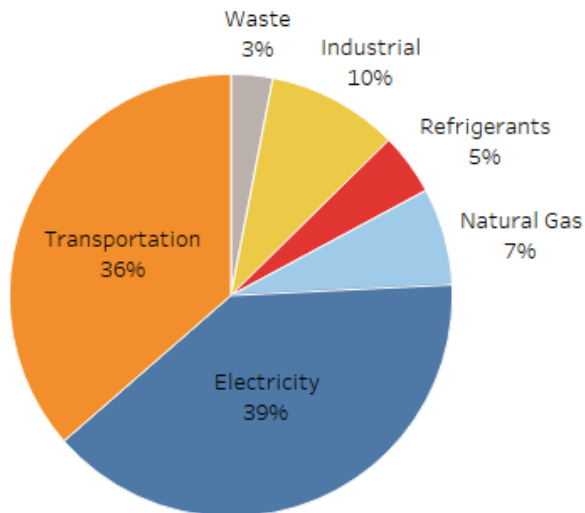
New Community-wide Goal



Previous Goal: Net-zero by 2050
(Previously Adopted by Council)

New Goal: Net-zero by 2040
(Adopted by Council on 9/30/21)

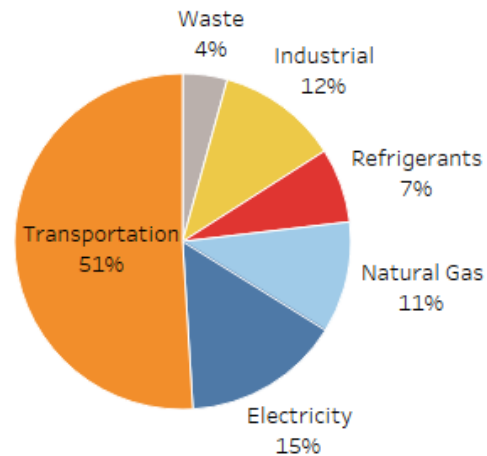
Community GHG Emissions



2020

10.9 million MT CO₂e

Natural gas: 770,000 MT CO₂e



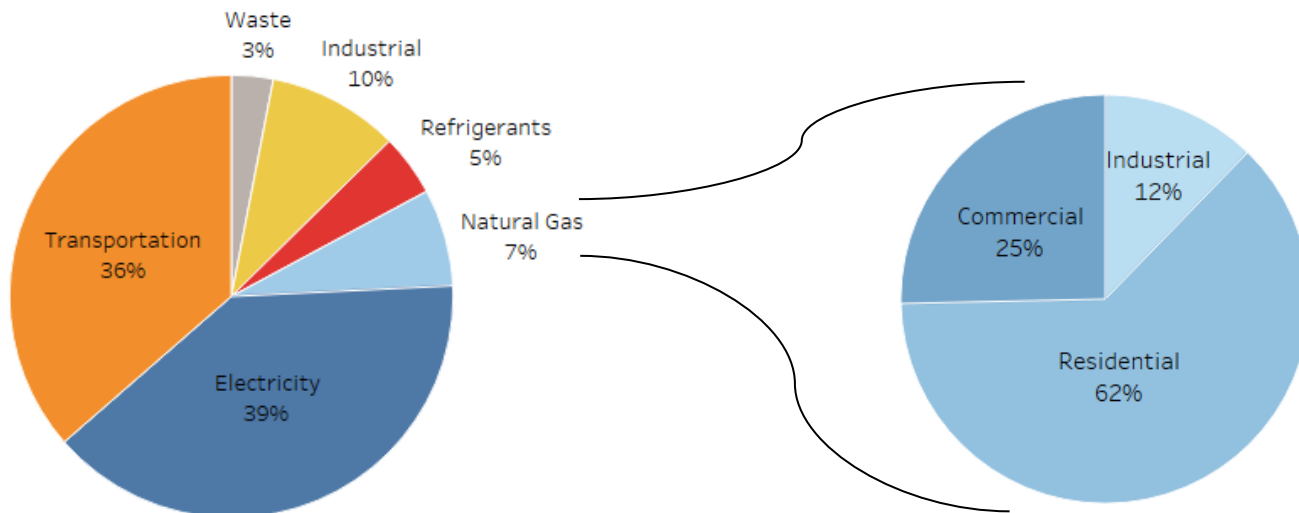
2030

6.3 million MT CO₂e

*Natural gas: 670,000 MT CO₂e

*If no action is taken, emissions from natural gas are projected to rise to **1 million MT CO₂e by 2030**

Community GHG Emissions



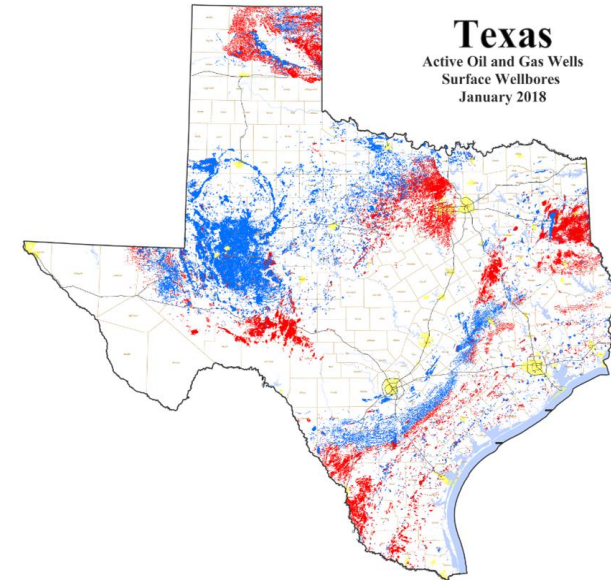
2020

10.9 million MT CO₂e

Natural gas: 770,000 MT CO₂e

What is Natural Gas?

- **Natural gas is a fossil fuel** created naturally over the course of hundreds of millions of years, formed when layers of decomposing plants and animals are subject to intense heat from the Earth and pressure from rocks.
- Natural gas is methane, which itself is a greenhouse gas.
When burned, it creates greenhouse gases (CO_2).
- Natural gas is used in buildings for space heating, hot water, and cooking. Emissions from natural gas come from 2 sources:
 - Burning the fuel for energy
 - Leakage of methane from the gas system
- **Most natural gas is now extracted through drilling and fracking.** It arrives at the surface, is captured, separated, cleaned, and processed. Then, it's compressed and put into pipelines that cross long distances to bring the product to customers.



**Gas wells are shown in red*

Equity Issues with Oil & Gas Extraction

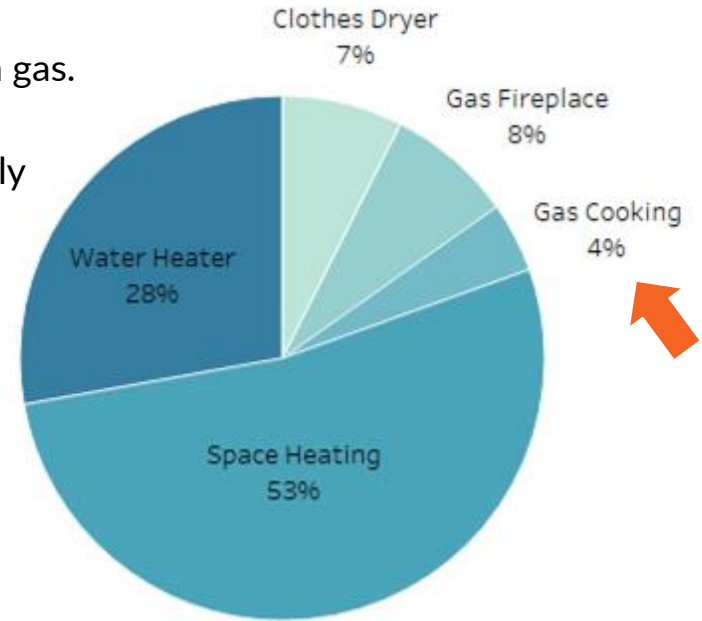


- Any time we use fossil fuels, we're supporting oil and gas extraction and environmental injustice. The extraction of natural gas pollutes water, air, and land at **all phases of the process**.
- Low-income communities, communities of color, and renters are most affected by poor indoor and outdoor air quality. **Gas appliances worsen indoor air.**

"There are over two million miles of gas pipelines cutting across the United States today, and according to the Center for Disease Control and Prevention Social Vulnerability Index, they're disproportionately concentrated in the most vulnerable communities. The data are clear: exposing low-wealth and communities of color to the risk of everything from leaking fumes to explosions, gas poses a particularly egregious threat to environmental justice." — **Southern Environmental Law Center**

Gas Cooking is the “Hook”

- Gas for cooking has been marketed as “attractive” by gas companies for decades, then the whole house is hooked on gas.
- Furnace, water heater, dryers are all invisible and completely replaceable (but much larger users) of gas.



Natural Gas Usage by Appliance
(Average Home in Central Texas)

Indoor Air Quality & Natural Gas

- Gas stoves emit nitrogen dioxide, carbon monoxide, and formaldehyde, each of which can [exacerbate respiratory and other health ailments](#).
- Impacts compound in small, poorly-ventilated spaces like older apartments.
- Children living in a home with gas cooking have a [42% increased risk of asthma](#) and a 2022 study found that **“12.7% of current childhood asthma in the US is attributable to gas stove use.”**
- Indoor pollution is estimated to cause thousands of cancer deaths and hundreds of thousands of respiratory health problems each year. We spend 90 percent of our time indoors. ([EPA](#))

Alternatives

Alternatives to Natural Gas



Propane



Renewable Natural gas



Electric Induction

Propane

- A Fossil fuel, very similar to Natural Gas
- Liquid at room temperature (under pressure)
- More energy dense than Methane



Costs:

- 4X more expensive per unit of energy, but has 2X the energy content
- Causes climate change
- When burned inside it still creates indoor air pollution, just like natural gas

Benefits:

- Flexibility, can be used without a building connection to the gas system
- Simple conversion of gas equipment to burn propane
- High heat and burns just like gas

Renewable Natural Gas (RNG)

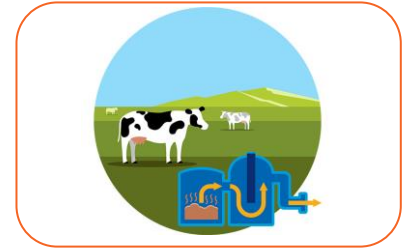
- Methane, but derived from biogenic carbon
- Burns exactly the same as natural gas
- When mixed in a pipeline it becomes indistinguishable from fossil gas, so a system of credits is used: renewable identification numbers (RIN)

Costs:

- Pricing is all over the place due to high demand and low supply, plus CA market
- Good guess could be 2-5X the cost of fossil gas
- Some utilities are offering on bill RNG / RIN credit programs
- When burned inside, it still creates indoor air pollution just like fossil gas

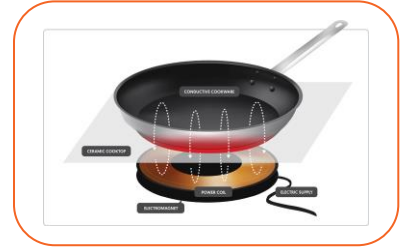
Benefits:

- It's not a fossil fuel, good for climate change
- Support renewable energy creation
- 1-1 direct use in current gas equipment



Electric Induction

- Electromagnetic Induction directly heats a magnetic pan



Costs:

- New cooking equipment
- Ensure pots and pans are magnetic

Benefits:

- Fueled by electricity (*was 64% carbon free in 2020, 94% carbon free by 2030*)
- Kitchen safety, efficiency, and speed
- Indoor air quality
- Avoided upstream oil and gas extraction

*Induction is currently used at local restaurants: Wright Bros.
Brew and Brew, Brentwood Social House, Patika, and L'Oca
d'Oro*

Restaurants & Induction

The lower performance and long wait times of older electric stoves created a stigma for electric cooking. Induction technologies are safer, more responsive, and now widespread and cost competitive, with many top chefs (Wolfgang Puck, Thomas Keller) using induction. Electric options exist for all applications.

- **Options:** Electric appliances are available for every commercial cooking approach, from ranges to woks to fryers.
 - § *Caveat: Can't swap gas broiler 1:1. Have to change process (e.g. cook carnitas in oven or use smoker).*
- **Safety:** With no open flame and little residual heat, induction cooking reduces accidental burns. There will never be a gas leak, and there is no igniter to fail.
- **Efficiency:** Induction ranges heat only the cookware; energy isn't wasted heating the air around the cookware. Induction stoves are 85% efficient. Gas stoves only deliver 32% of the flame heat to the cookware (SF Environment).
- **Speed:** Induction ranges can boil water twice as fast as gas.
- **Responsiveness:** With all energy going directly into the pan, temperature can be raised or lowered almost instantly.
- **Cooler kitchen:** Since virtually all the energy is going in to the pan rather than the air, the area around induction equipment stays cooler.
- **Easy to clean:** Smooth & cooler induction surface can be easily wiped clean.

Zach's House

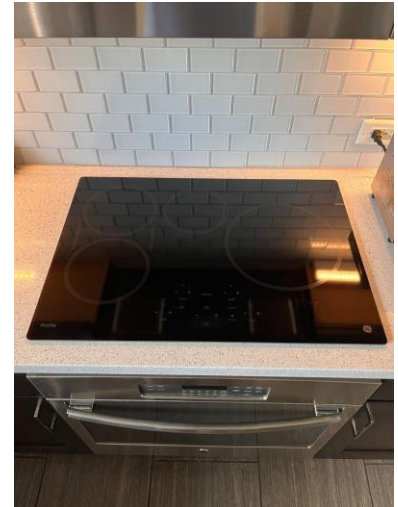
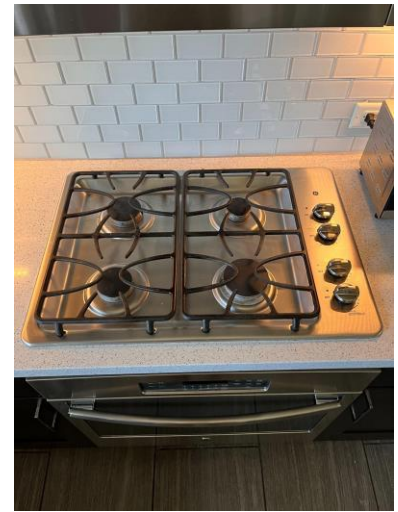
Original gas cooktop installed when the house was built
Replaced in September 2022 with a GE Induction

Costs:

- Cooktop - \$1700
- Electrician & Plumber Costs - \$1000
- New Pots & Pans (needed replacement anyway) - \$300

Benefits:

- 3 kids with cleaner indoor air
- No fossil fuels in my kitchen
- Kids feel much safer helping and learning to cook
- Macaroni in minutes!

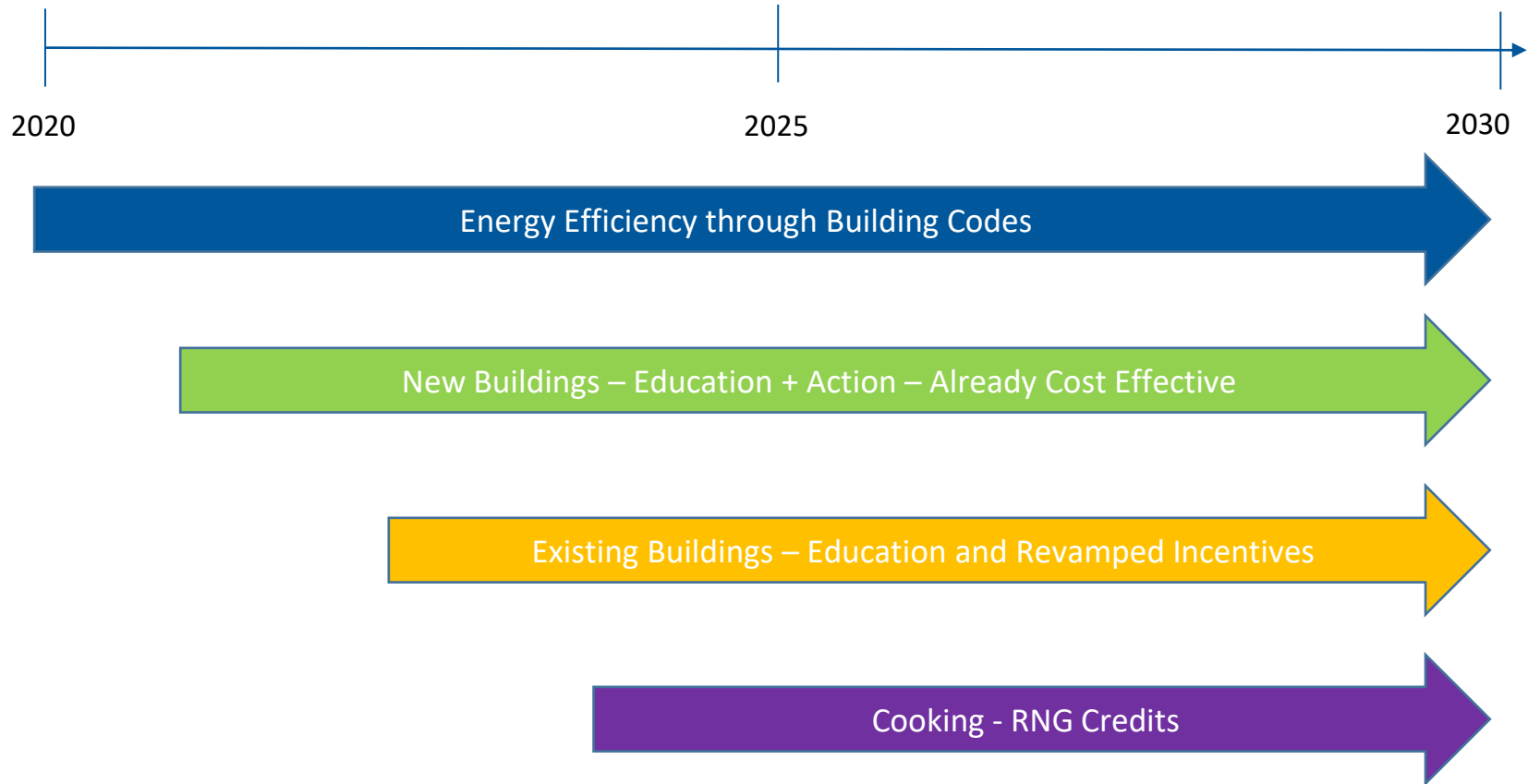


Ways Forward

What Does the Climate Equity Plan Say?

- Doesn't include a gas ban.
- We need buildings powered by renewable energy, electric is not the only option.
- Renewable gas would work, but is not widely available right now, we'd be purchasing RIN credits.
- There is nothing that immediately changes because of the plan, this process will take time.
- **From the plan:**
Ensure all new programs are created with equity principles, are guided by community input, and value cultural differences. Collaborate with affordable housing developers, public-serving entities, and small businesses to prioritize net-zero carbon buildings in low-income communities and communities of color. Pursue ways to expand energy services, such as weatherization, to best serve all multi-family residents.

Climate Equity Plan Implementation Timing



Conclusion

- Burning fossil fuels in buildings is bad for occupants and the environment. We need to equitably phase out the use of fossil fuels. This is not a simple or easy process and **all sectors need to contribute reductions**.
- Electrification of some equipment in new buildings is cost effective now. Achieving equitable solutions in existing buildings will require **incentives, stakeholder engagement, and a longer ramp**.
- **There is no “gas ban” in Austin**. We have more work to do in this space, and the solutions should center equity and involve incentives.