



**The Other IRA:
Inflation Reduction Act:
The Most Important Act For Your Grandkids' Futures**

Sponsored by
Panorama Learning in Retirement and
Panorama Green Team

Wayne Olsen - October 18, 2023

INFLATION REDUCTION ACT: The Most Important Act for Your Grandkids' Futures

Introduction

IRA Overview: Goals and Timeline

Why Reduce Greenhouse Gas (GHG) Emissions?

Climate Package within IRA

- Cost, Incentives, Implementation Status

The Good, the Bad, and the Ugly

- Will We Achieve Our GHG Reduction Goals?

Q&A, Discussion

Public Law 117–169
117th Congress

Aug. 16, 2022
[H.R. 5376]

Appropriations
authorizations.

An Act
To provide for reconciliation pursuant to title II of S. Con. Res. 14.
*Be it enacted by the Senate and House of Representatives of
the United States of America in Congress assembled,*

TITLE I—COMMITTEE ON FINANCE
Subtitle A—Deficit Reduction

SECTION 10001. AMENDMENT OF 1986 CODE.
Except as otherwise expressly provided, whenever in this sub-
title an amendment or repeal is expressed in terms of an amend-
ment to, or repeal of, a section or other provision, the reference
shall be considered to be made to a section or other provision
of the Internal Revenue Code of 1986.

PART 1—CORPORATE TAX REFORM

SEC. 10101. CORPORATE ALTERNATIVE MINIMUM TAX.
(a) IMPOSITION OF TAX.—
(1) IN GENERAL.—Paragraph (2) of section 55(b) is amended
to read as follows:

26 USC 55.



2023 Chevy Bolt EV

Inflation Reduction Act Overview and Goals

Largest piece of federal legislation ever to address climate change

\$369+ billion funding to be spent over 10 years on climate and energy

Goals:

Reduce U.S. GHG emissions by 50% - 52% by 2035;

Ultimate goal: net-zero GHG emissions by 2050

Drive down consumer energy costs

Increase energy (and national) security

Other portions of this reconciliation bill:

Affordable Care Act Extension (\$64 B)

Deficit Reduction:

Prescription Drug Pricing Reform (\$288 B)

15% Corporate Minimum Tax (\$313 B)

IRS Tax Enforcement (\$124 B)

Total Deficit Reduction \$300+ B

Inflation Reduction Act Overview: Timeline

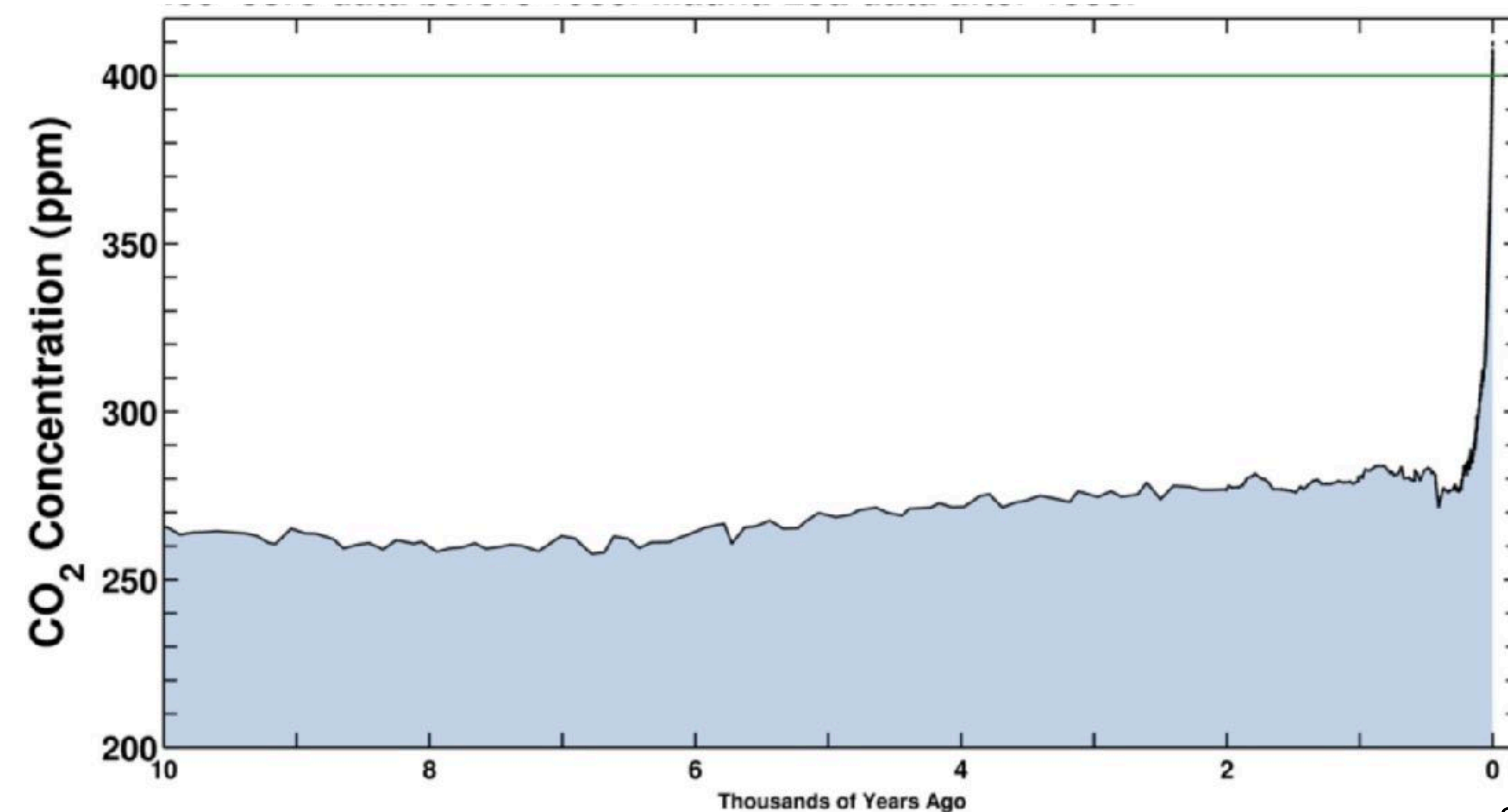
- 2021 - Aug - Bipartisan Infrastructure Act (BIL) passed Senate (69-30)
- 2021 - Sep - Build Back Better Act (BBB) passed U.S. House, (220-213) (\$2.2 Trillion)
- 2021 - Nov - BIL passed House, (228-206) (\$1.2 Trillion)
- 2022 - Jan-Jul - BBB died in U.S. Senate
- 2022 - Jul - BBB resurrected in U.S. Senate as Inflation Reduction Act (IRA)
- 2022 - Aug - IRA passed Senate (51-50) and House (220-207) (~\$369 B for climate)
- 2022 - 2032** - Period that many of the IRA's incentives remain in effect

Why Reduce GHG Emissions?

Scientists' Conclusions:

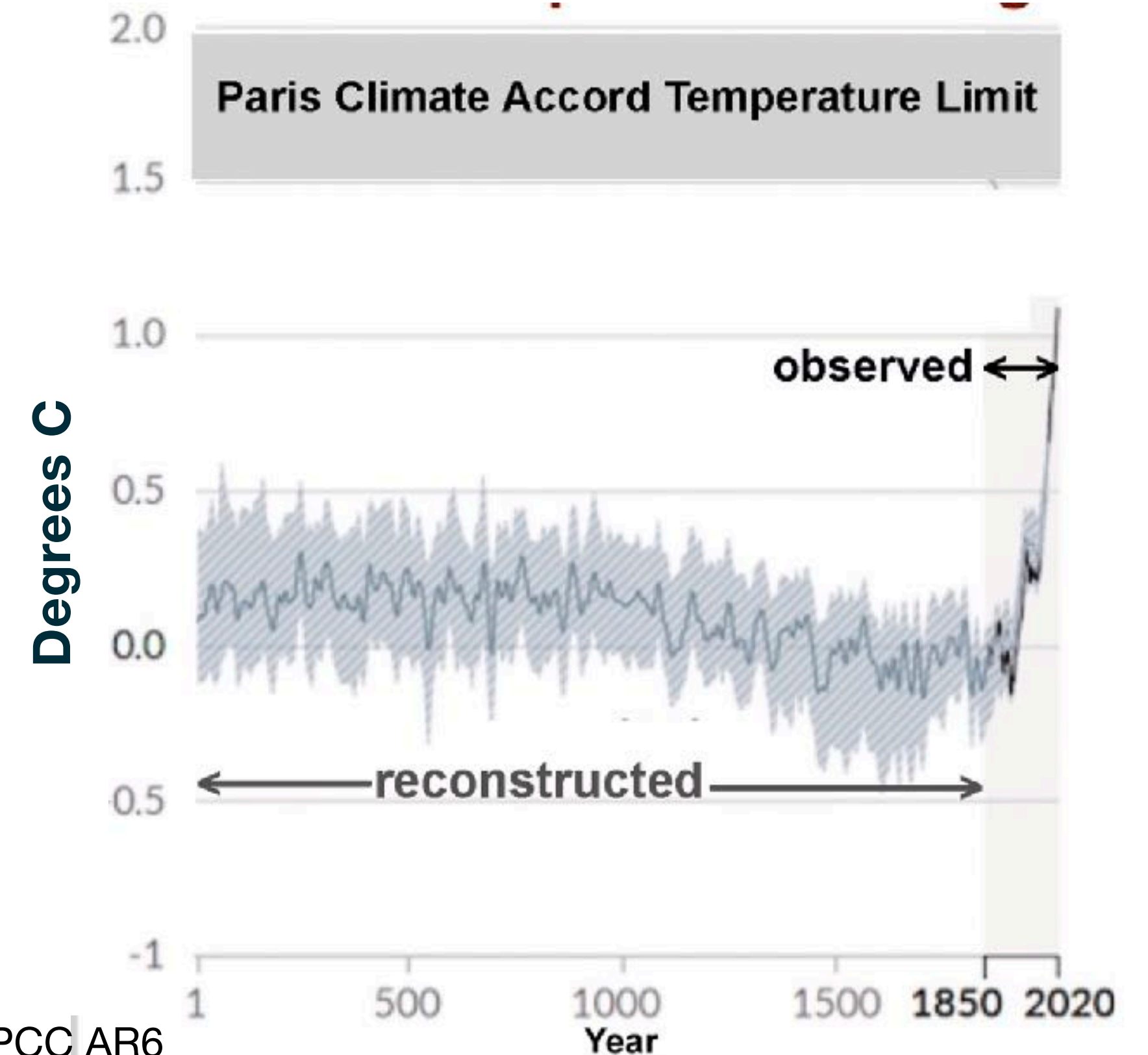
1. **Unequivocal** that humans have warmed the planet;
2. **Rate** of warming is unprecedented in at least the last 2000 years;
3. Primary cause of warming is GHG emissions from burning fossil fuels;
4. Atmospheric CO₂ is now highest it has been in at least the last 2 million years

Atmospheric CO₂ Change Last 10,000 years



Source: IPCC AR6

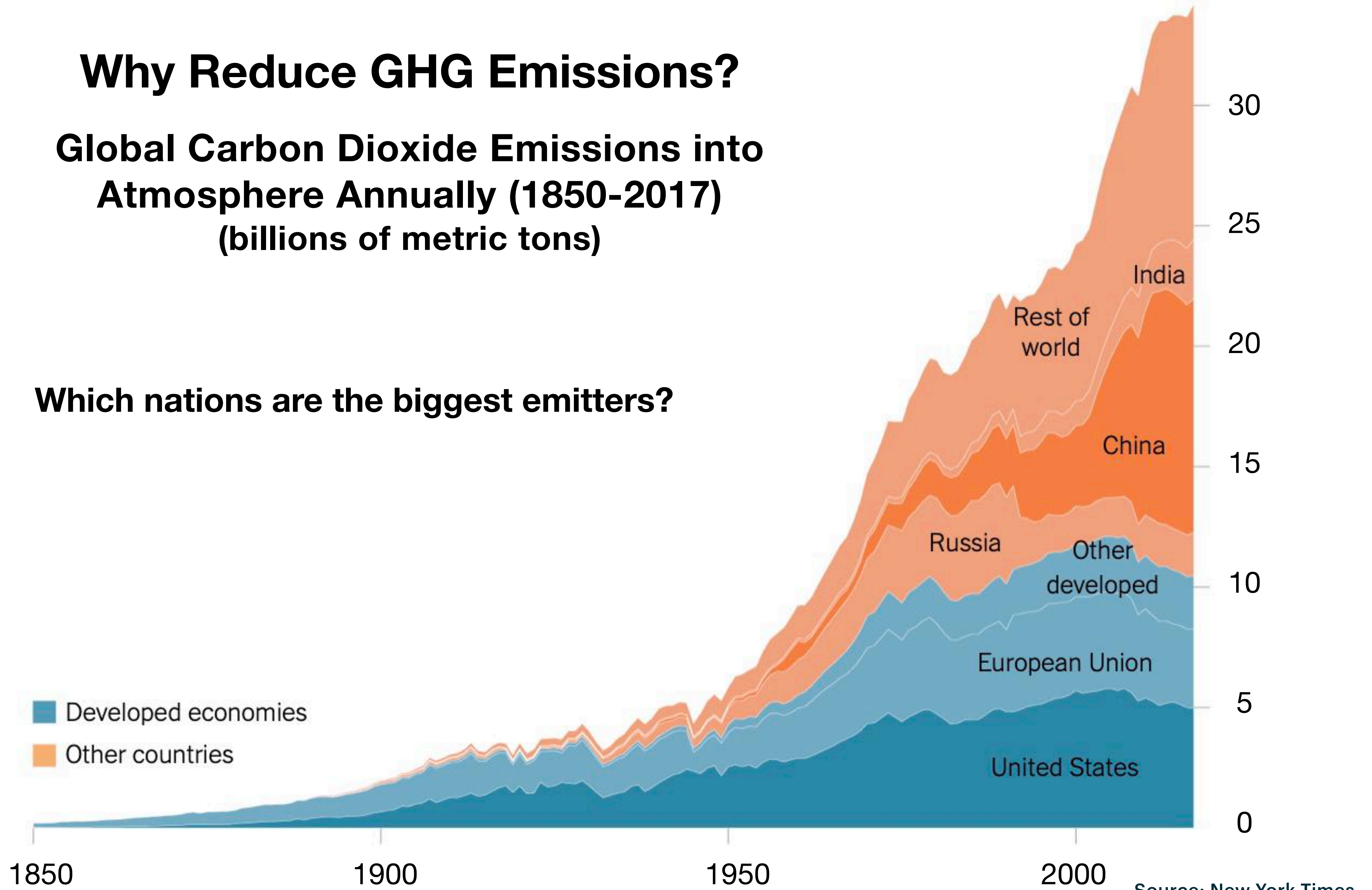
Temperature Change Last 2,000 Years



Why Reduce GHG Emissions?

**Global Carbon Dioxide Emissions into Atmosphere Annually (1850-2017)
(billions of metric tons)**

Which nations are the biggest emitters?



Why Reduce GHG Emissions?

Which nation is the **most extravagant** emitter?

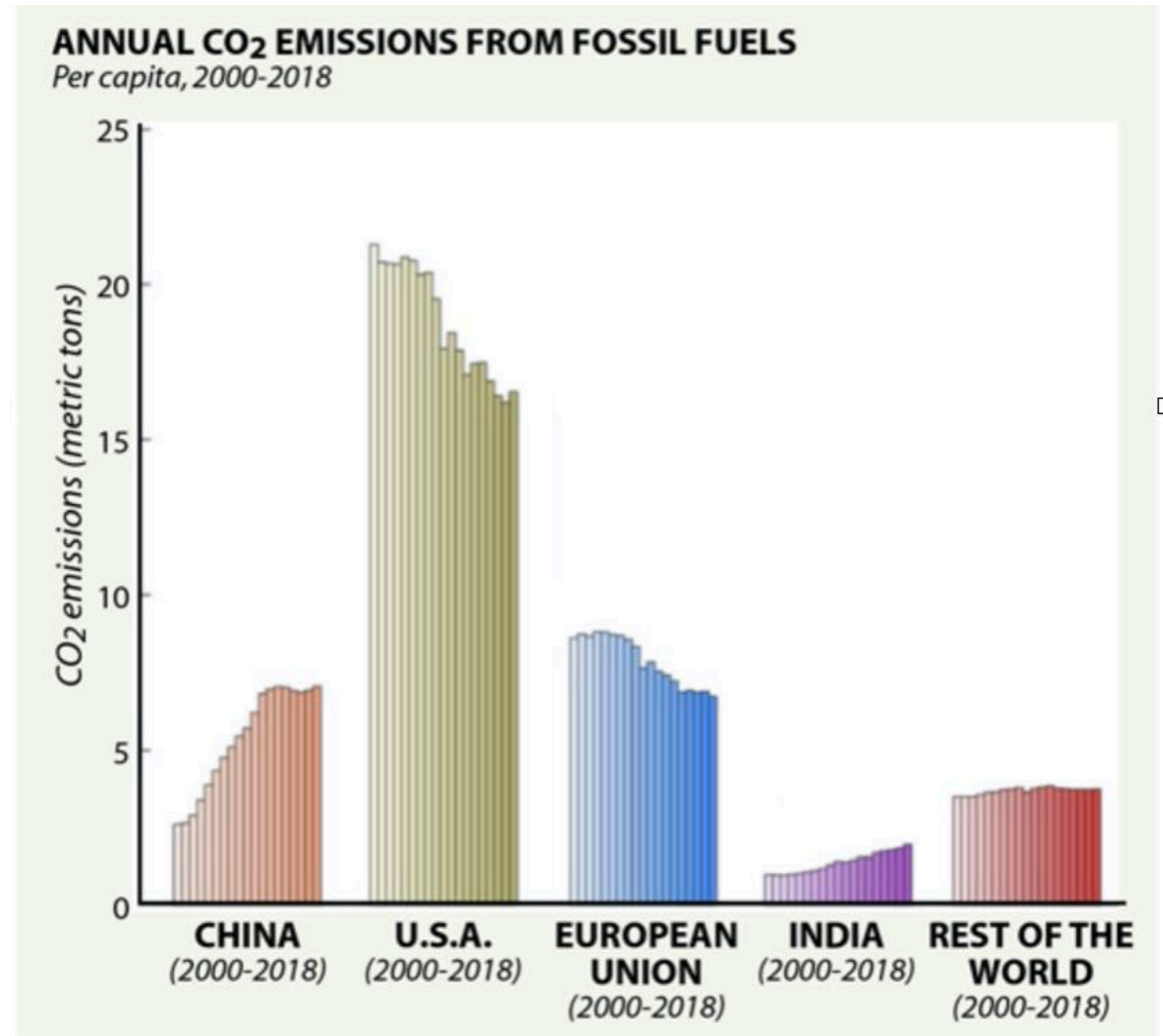
Our “Carbon Footprint”

U.S. residents have envious lifestyle
Other nations aspire to our model

We are in position to reduce our
emissions the most

Federal, State, and local incentives help
Whether as home owner, renter, landlord,
business owner, car owner, or parent

How big is your “Carbon Footprint”?



SOURCE: Rob Jackson, et al. 2019, Inside Climate News

What Happens If We Don't Reach Net-Zero GHG Emissions?

Physical Changes to our Climate Due to GHG Emissions

- **Higher Air/Land Temps**

- Droughts
- Desertification
- Melting glaciers & icecaps
- Permafrost thaw

- **Higher Ocean Temps**

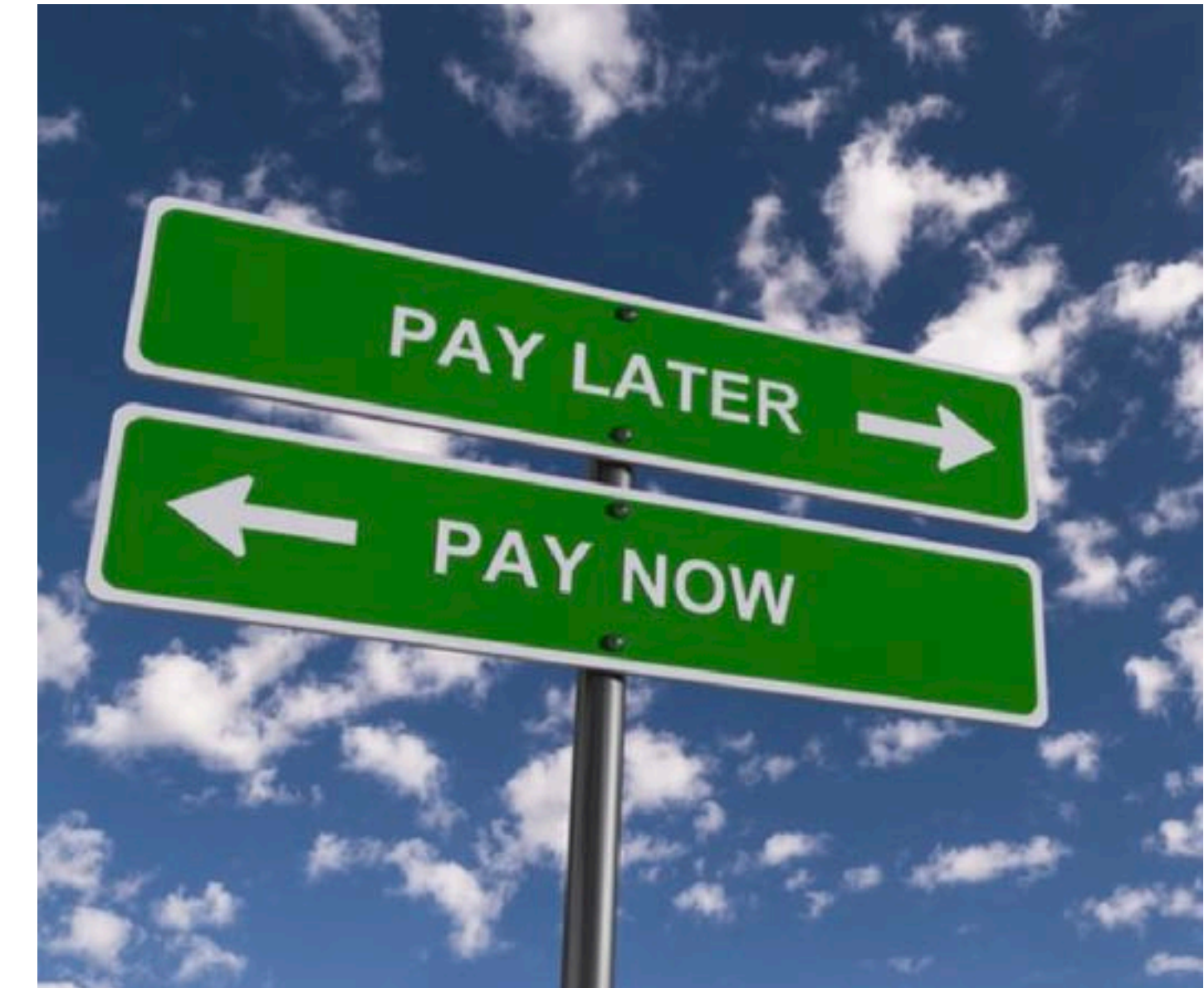
- Sea level rise
- Loss of coral habitat
- Turbocharged storms
- Change in ocean currents & global weather patterns

- **Extreme Weather**

- Stronger storms
- Heavier precipitation
- Higher flood frequency

- **Higher Ocean CO₂**

- Ocean acidification
- Loss of base of food chain



What Happens If We Don't Reach Net-Zero GHG Emissions?

The Cost of Greenhouse Gas Emissions: Impact on Humans

- **Economic Losses**
 - Storm damage
 - Infrastructure loss
 - Crop failures
 - Reduction of fisheries harvest
 - Wildfires
 - Ecosystem loss
- **Loss of Civil Society**
 - Infectious diseases
 - Higher human mortality rate
 - Famine
 - Political instability
 - Climate refugees
 - Threat to national security
 - Our way of life
 - Species extinction



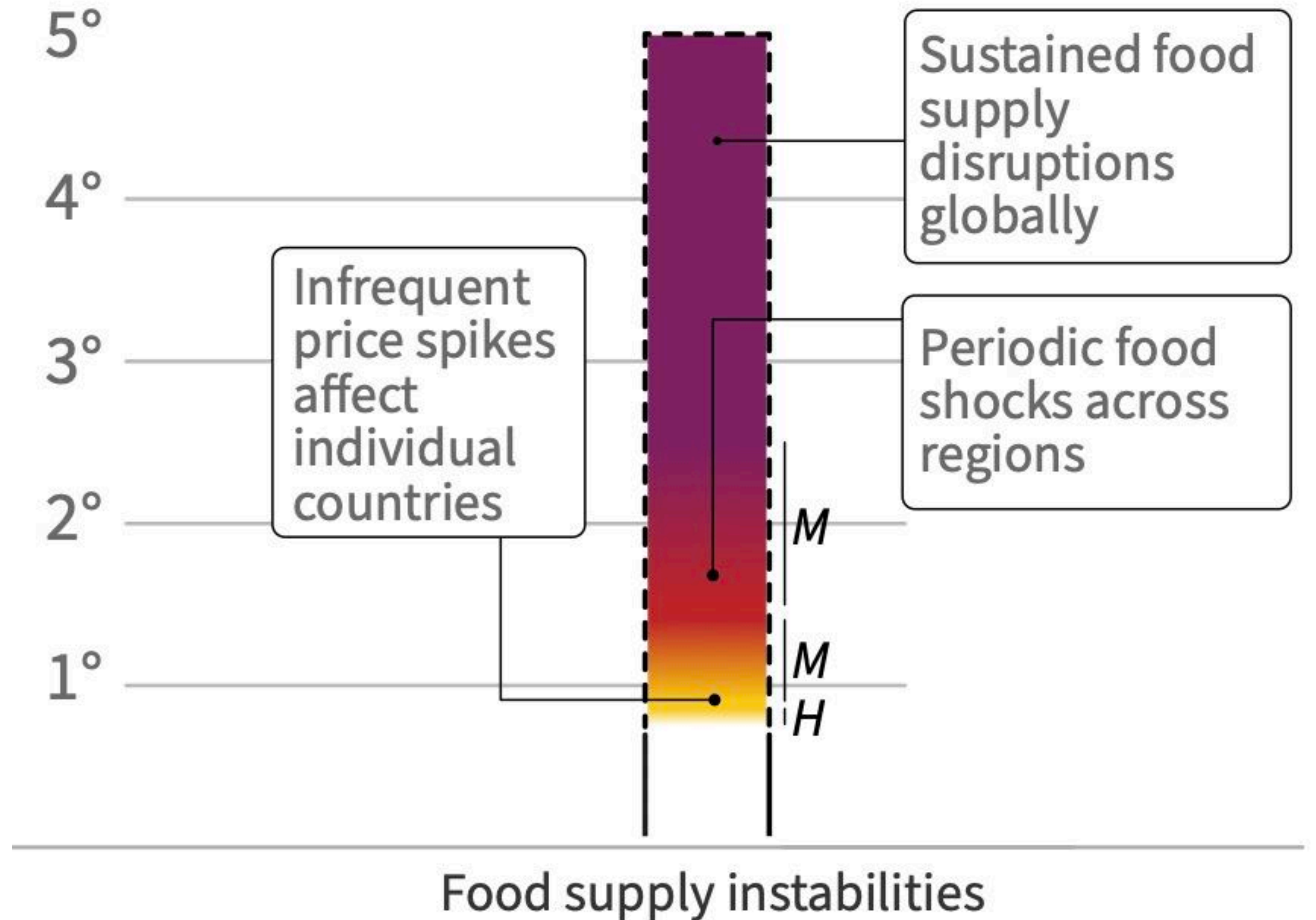
= “#1 Threat to the Global Economy”

Why Reduce GHG Emissions?

Example of Near-Term Risks

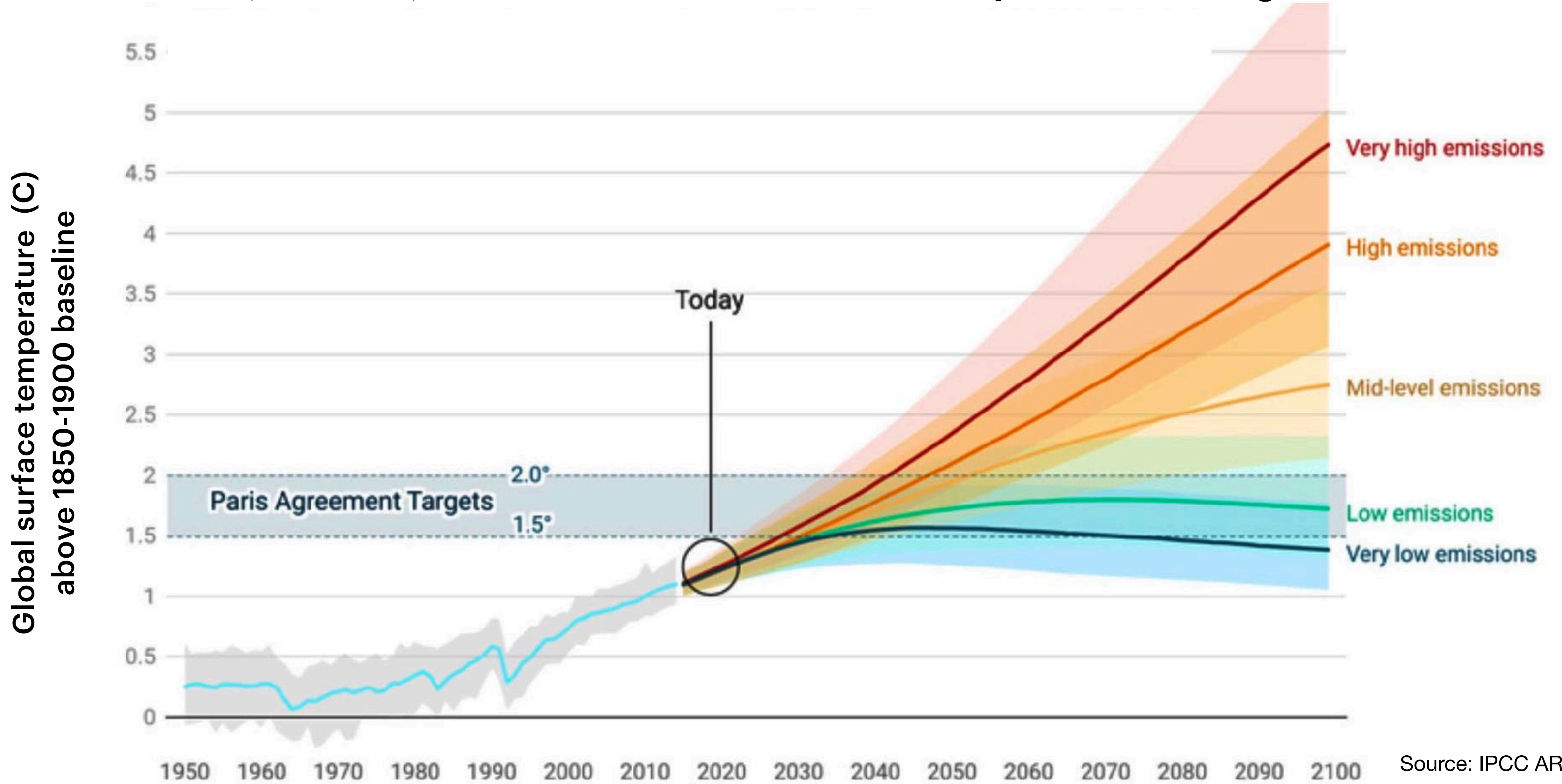
(Degrees Celsius)

Purple = Very High
Red = High
Yellow = Moderate
White = Undetectable



Why Reduce GHG Emissions?

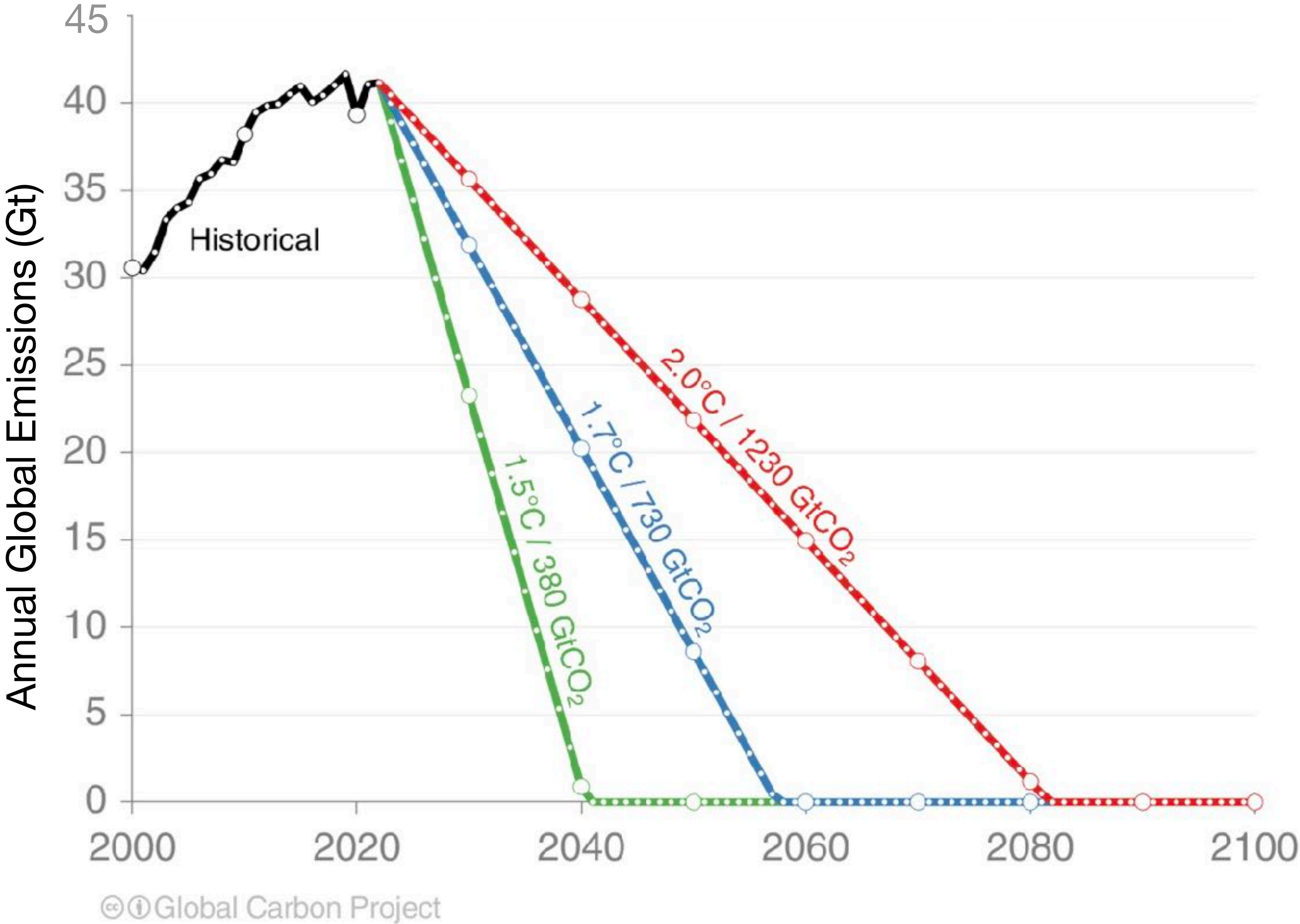
Past, Present, and Future Global Surface Temperature Change



Why Reduce GHG Emissions?

How Much Time Do We Have Left?

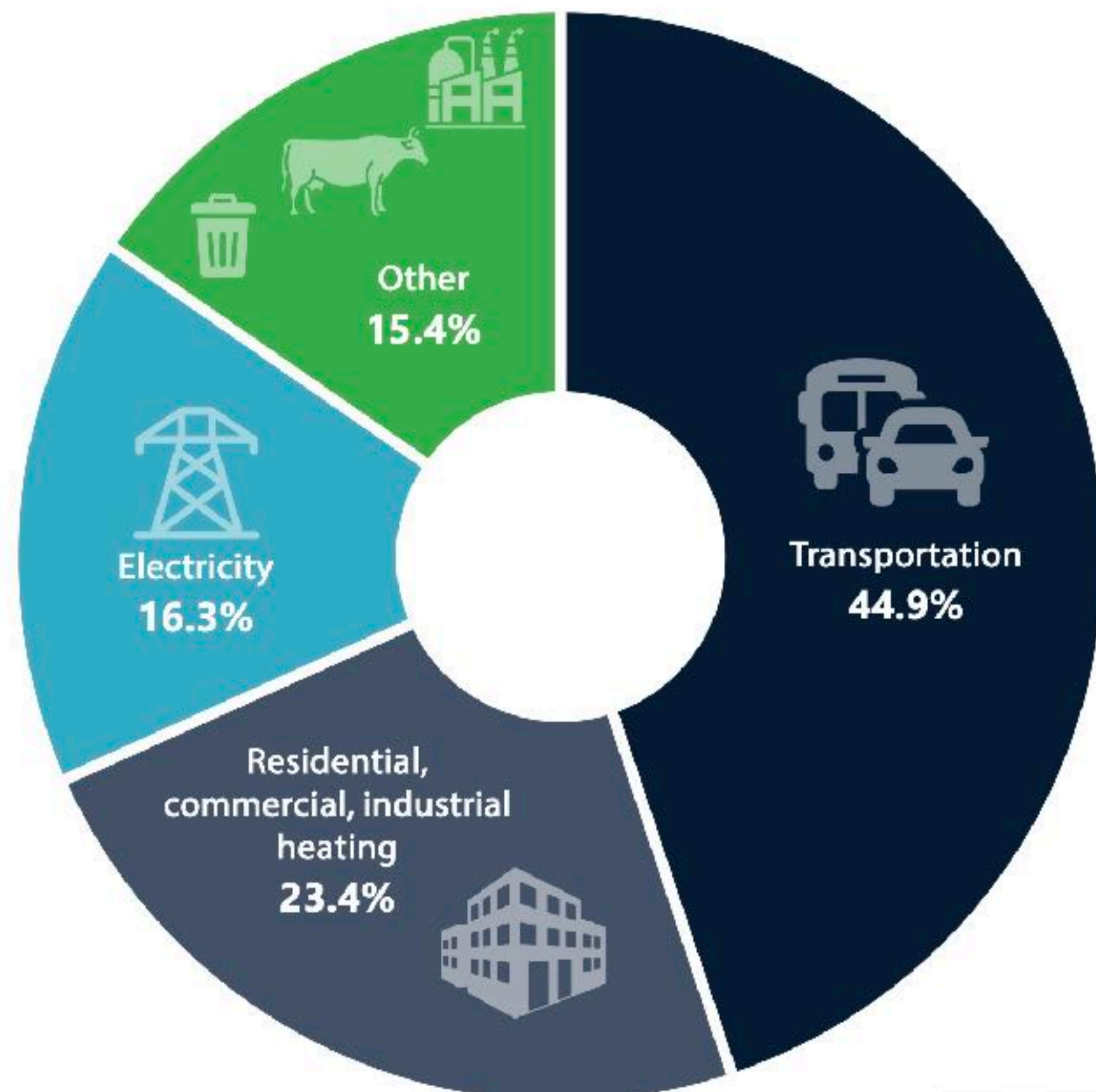
The World's "Carbon Budget"



Source: [Friedlingstein et al 2022](#); [Global Carbon Project 2022](#)

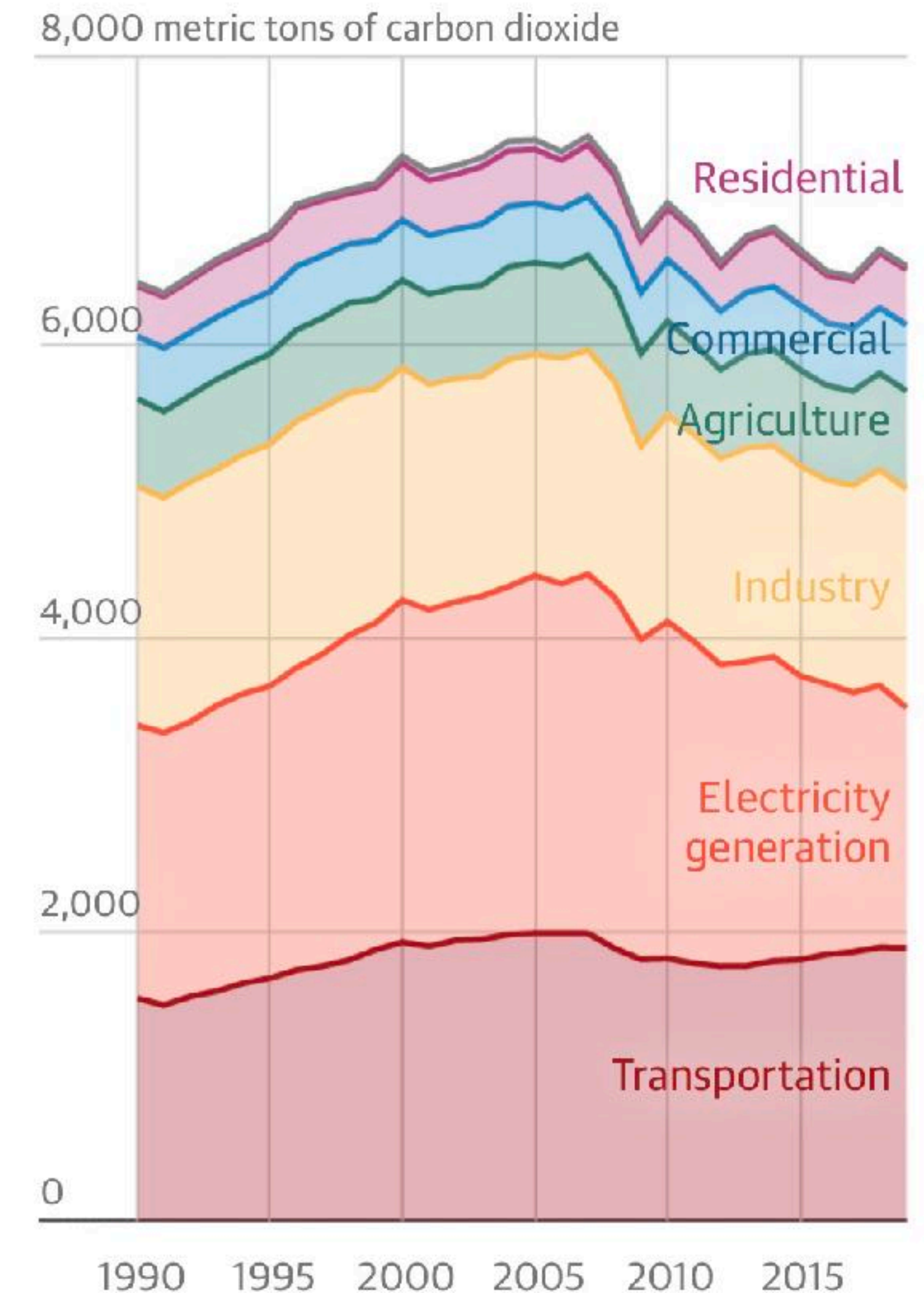
CO2 Emission Sources By Economic Sector

Sources of Washington greenhouse gases



Source: Washington State Department of Ecology

Annual CO2 emissions by US economic sector



Guardian graphic. Source: US Environmental Protection Agency

Climate Package Within IRA and BIL: How To Achieve Goal of Net-Zero GHG by 2050

Use “carrots” (incentives) instead of “sticks”

Electrify everything

Transition toward renewables and away from fossil fuel as energy source in all areas

- Electricity generation (both utility and local scale)
 - Electrical grid capacity
- Residential and commercial energy efficiency
- Transportation
- Agriculture (mostly to be addressed in Farm Bill)

% of funds set aside as grants for low income residents, administered by states

Electricity Generation (Utility Scale)

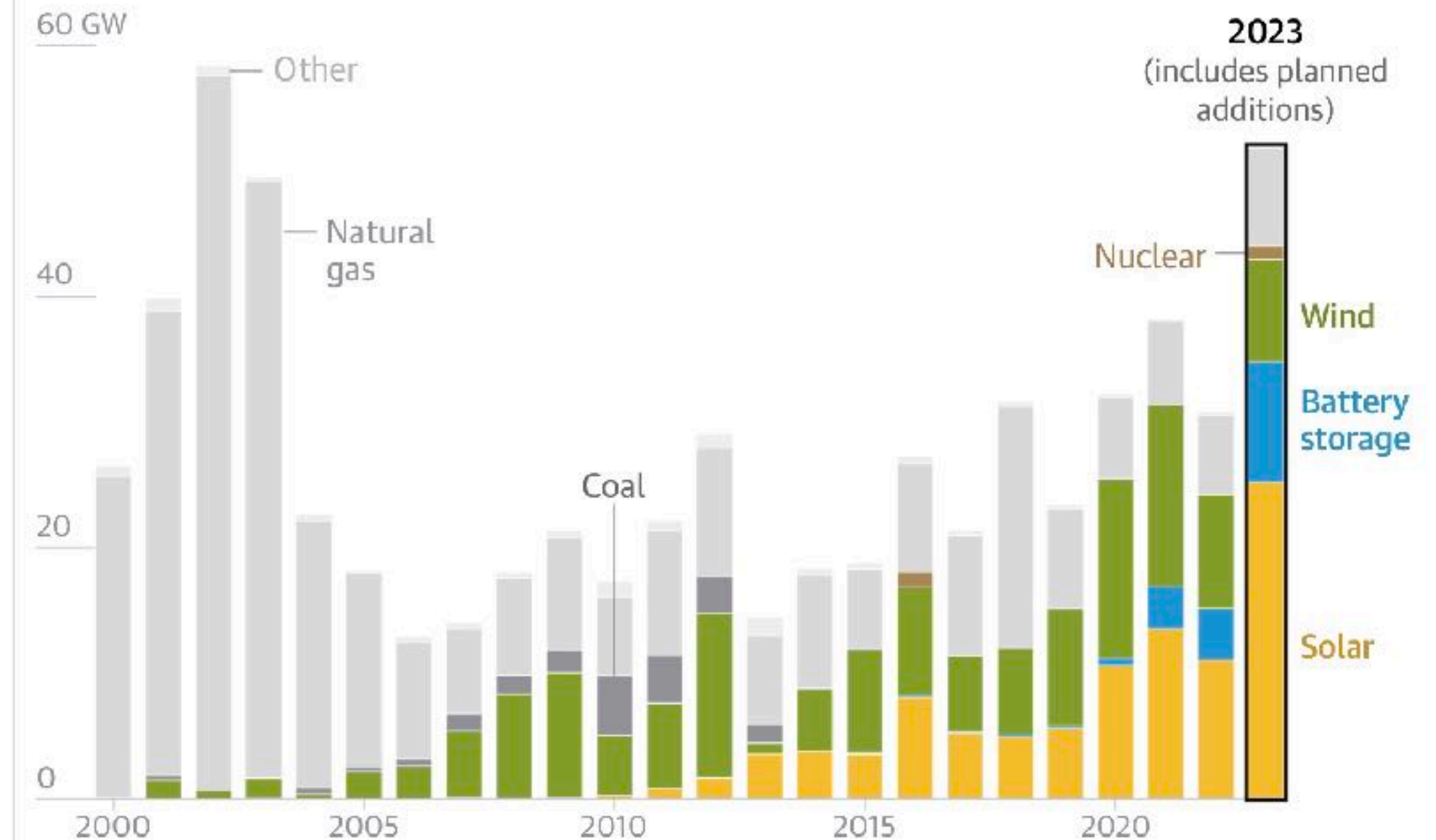
Renewables now cheaper than gas, coal, or nuclear;

IRA Law reaffirms EPA use of Clean Air Law for CO2 (subject to court challenges)

Investment Tax Credits and Production Tax Credits for solar, wind, batteries, storage, etc.

Siting of new solar and wind power sites difficult; Offshore wind projects suffering multiple delays

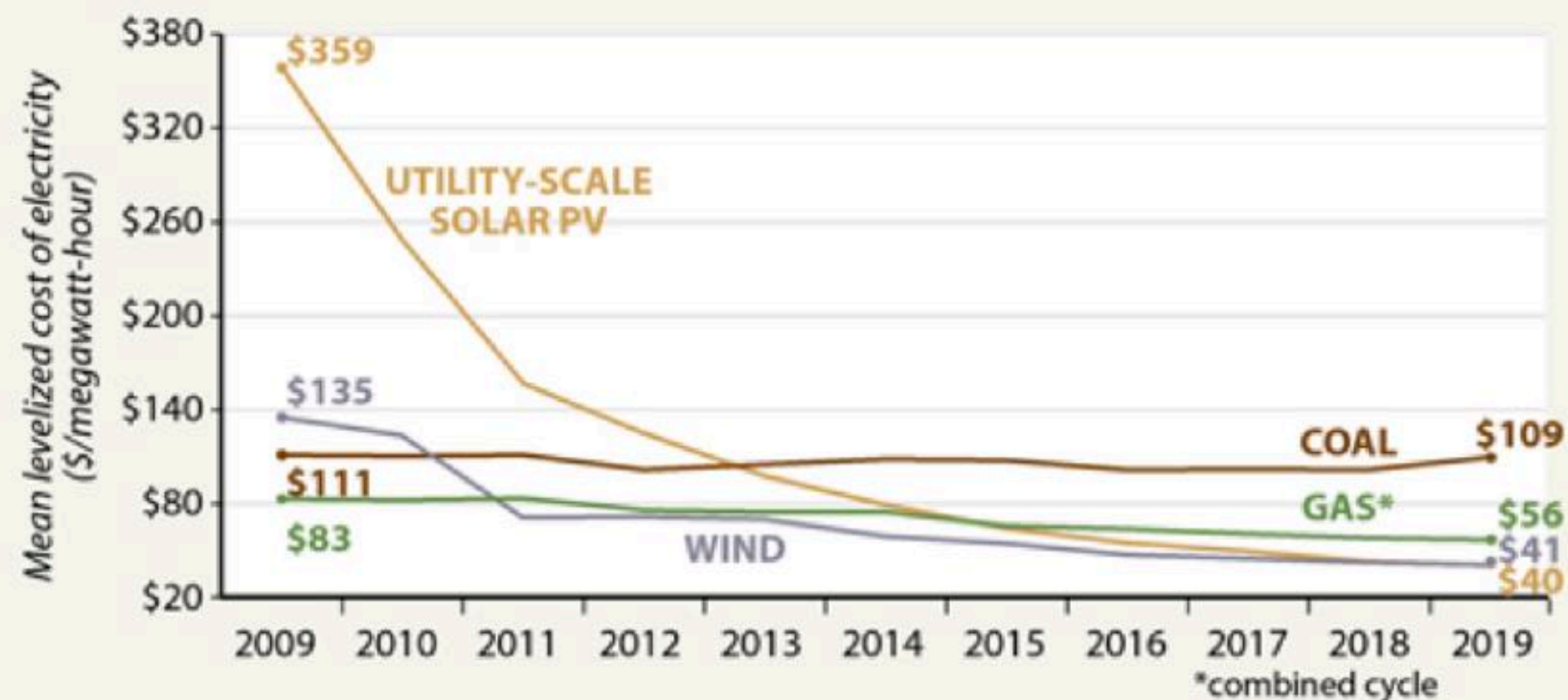
Over 80% of new electric energy capacity in 2023 is renewable



Guardian graphic. Source: Energy Information Administration. Note: 2023 capacity includes planned additions as of June.

HISTORIC AVERAGE LEVELIZED COST OF ENERGY

Per megawatt-hour, unsubsidized values, 2009-2019



SOURCE: Lazard

InsideClimate News



Wind Farm

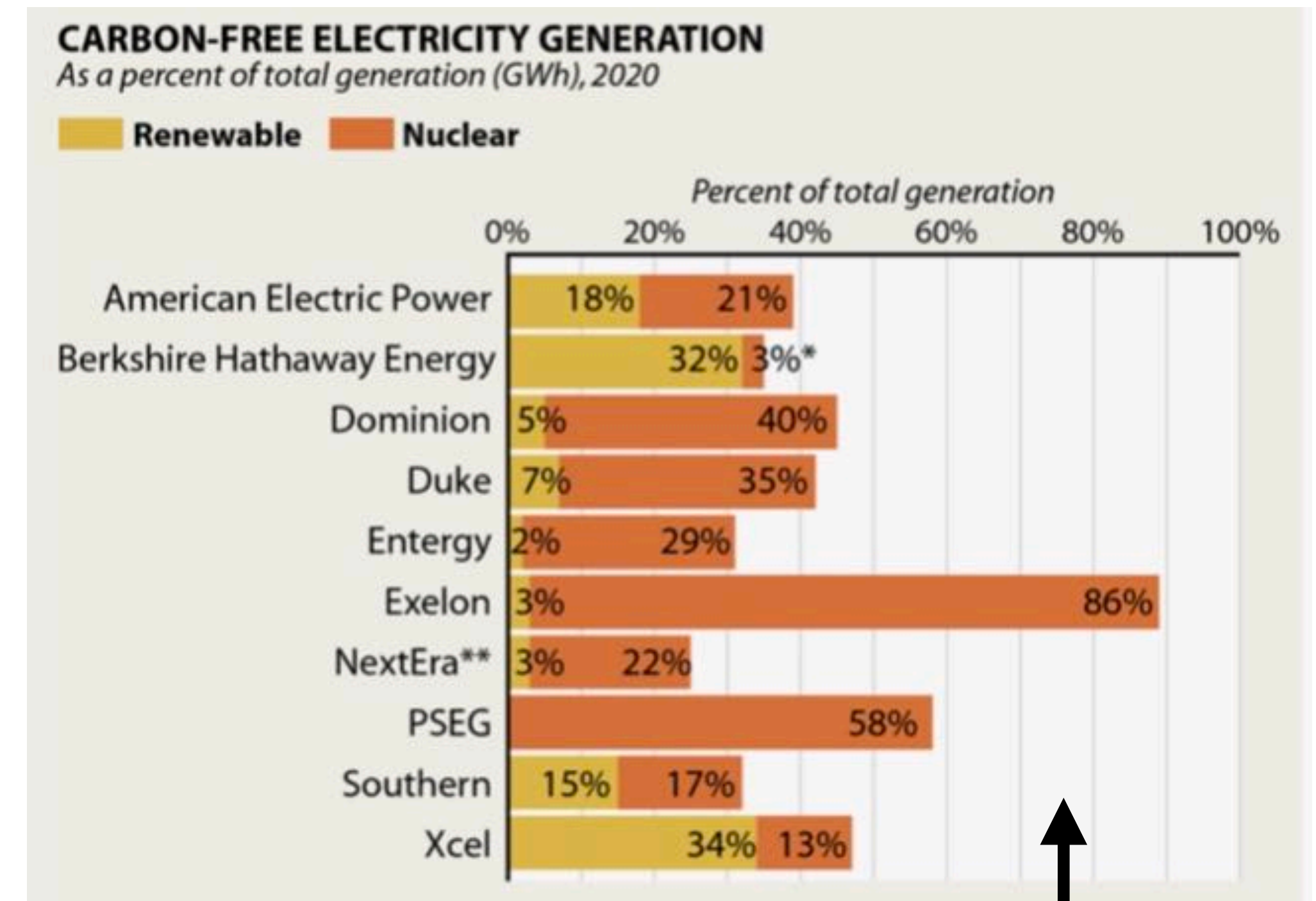
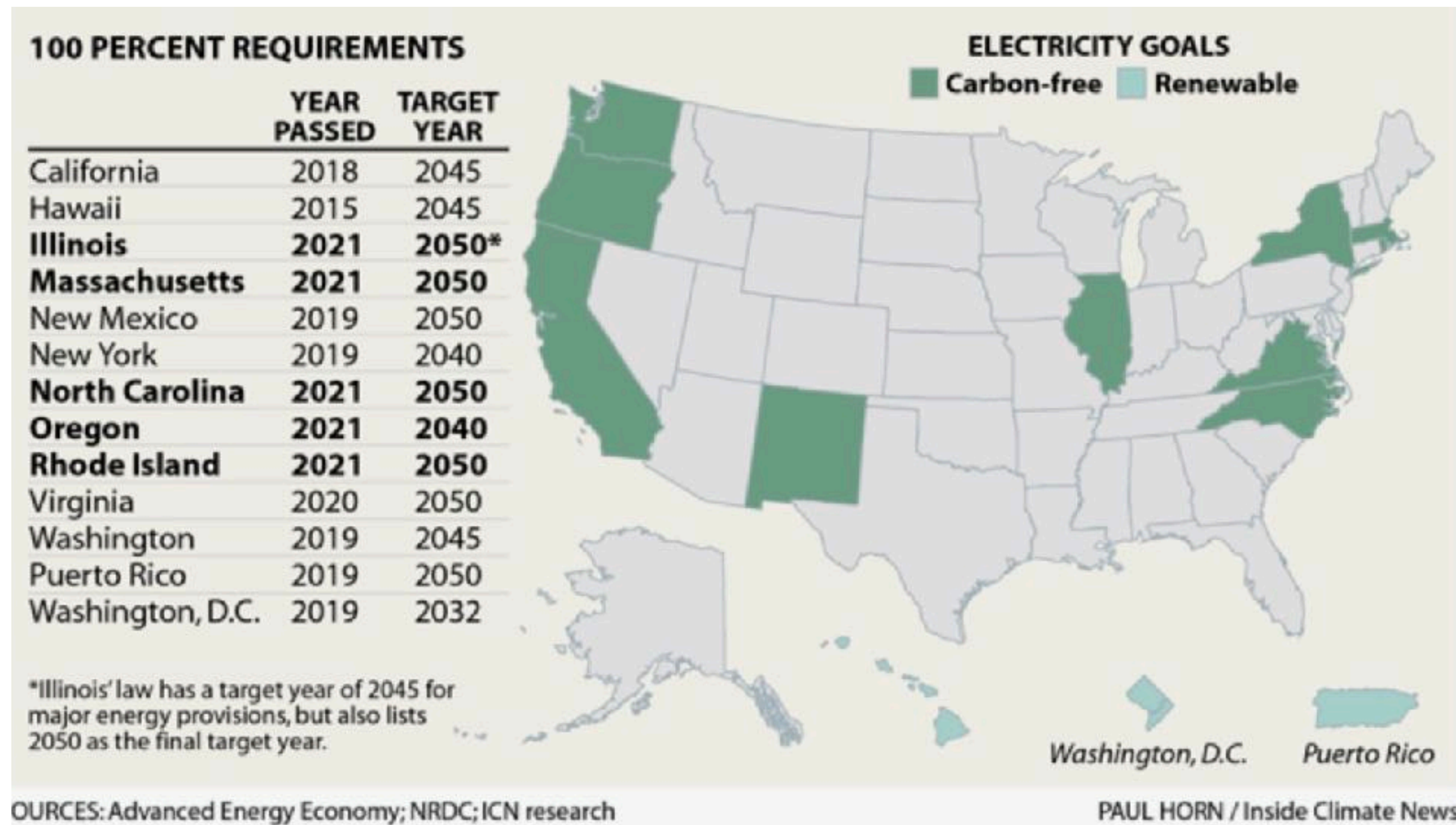
Electricity Generation (Utility Scale)

Massive expansion of electricity production required;

WA CETA law requires utility use no coal after 2025
net-zero carbon by 2030; carbon-free by 2045

Carbon capture & limited nuclear funding via BIL

10 Largest U.S. Electric Utilities



Note: Fossil Fuel is the White Area

Electricity Generation (Distributive/Local Scale)

IRA provides major incentives for rooftop solar

Residential, community solar, and local commercial

Covers panels, battery storage, installation

30% tax credit (non-refundable)

For Low/Middle Income (LMI) residents:

Limited \$ for grants to 100% / 50% of project cost

Approvals administered by states

One of best actions to quickly reduce carbon emissions

If widely used with battery storage, load on utility and power grid can be reduced substantially

Est. value of IRA incentives: \$22B (over 10 years)

My previous home example: (Not including EV)

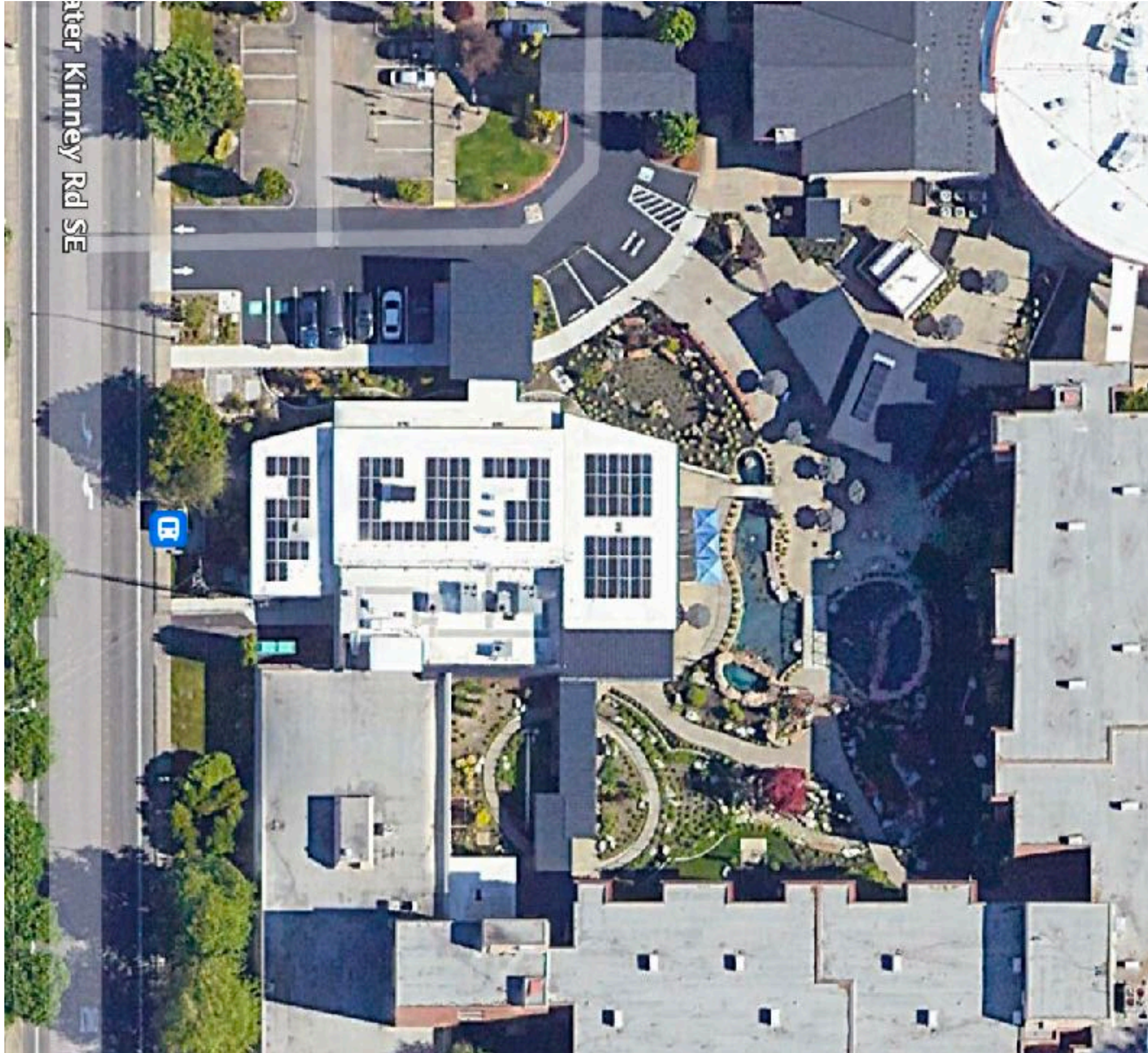
Electricity cost savings: \$1200 per year

GHG Emissions avoided: 7.7 tons per year

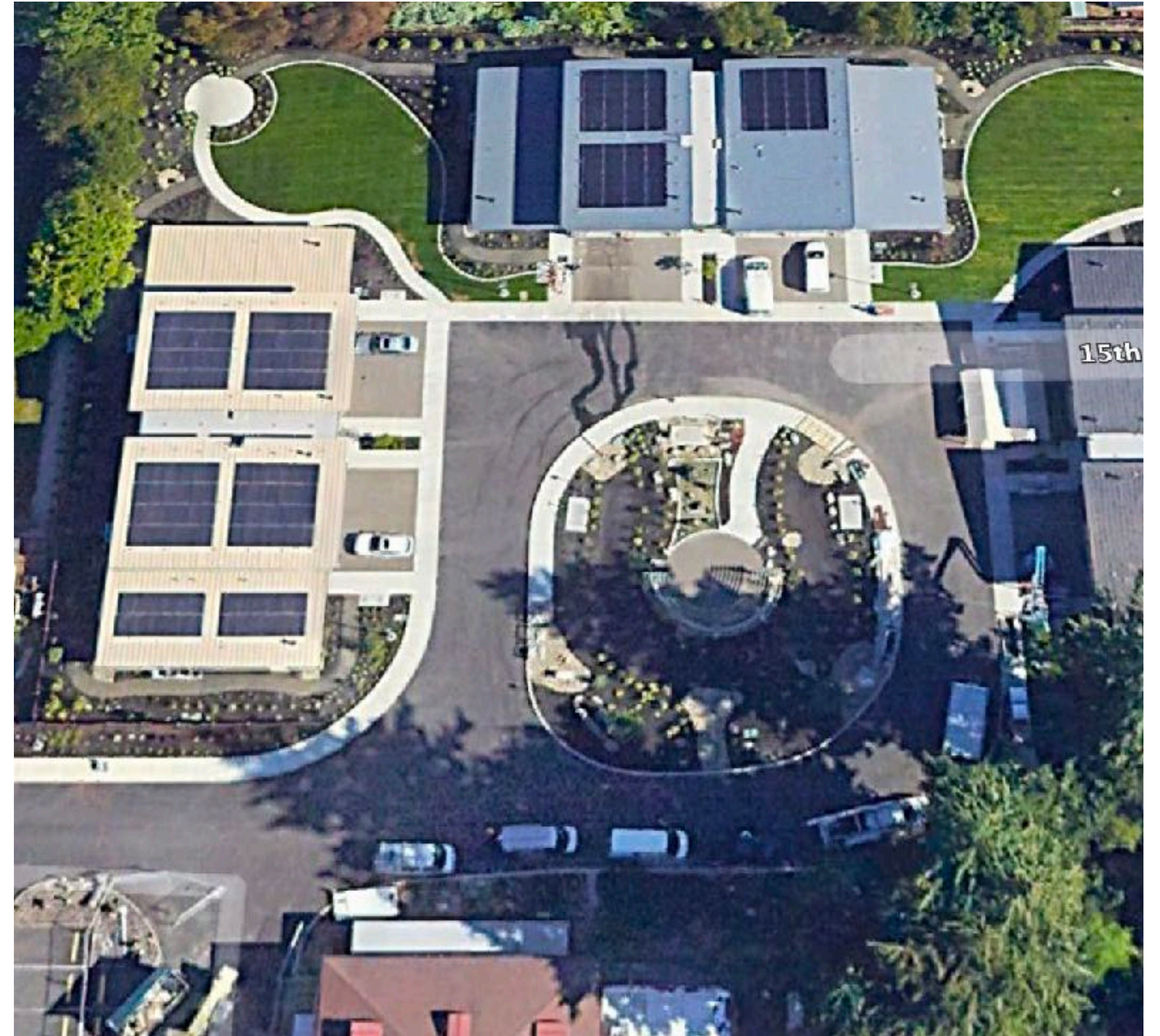


Electricity Generation (Distributive/Local Scale)

Panorama Solar Installations



Assisted Living



Willow Lane

GHG Emissions Avoided: About 90 tons per year

Power Grid Capacity

Challenges:

Get power from generation point to customers

Where customers are, and **when** they need it

U.S. Power Grid Needs Significant Upgrade

Very old, low tech grid connecting areas now

Question: who owns it? Who pays for it?

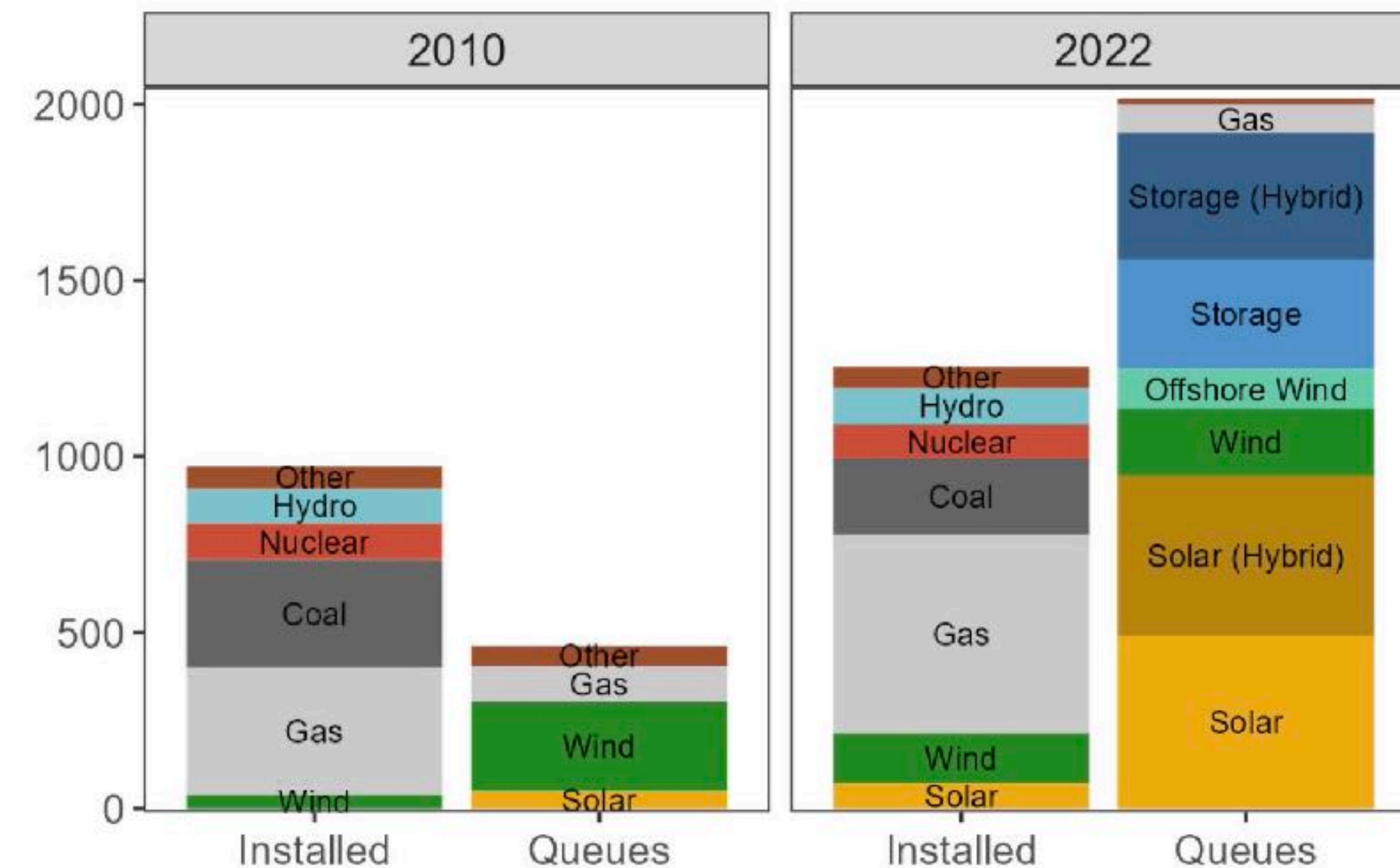
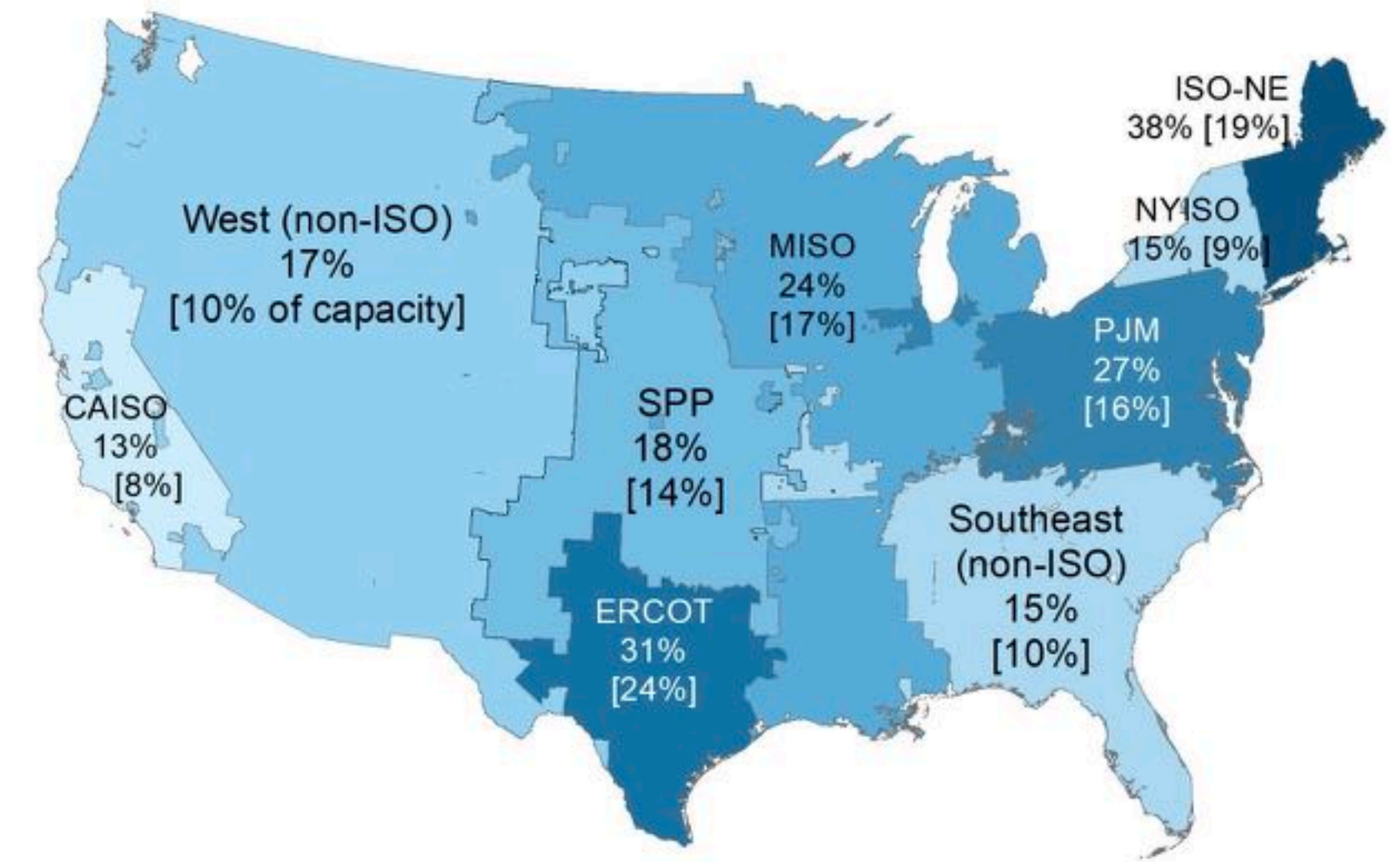
Long approval process to projects to be added

2 TW of power in queue awaiting approval

2035 capacity needs to grow 3 times 2020 level

FERC issued major interconnection reform Aug 2023

Grid funded for \$65B of upgrades via Bipartisan Infrastructure Law (BIL)



Residential (& Commercial) Energy Efficiency

Reduce:

Energy Loss

Demand on Power Grid

Electric Bill

(and eliminate gas bill)

IRA Includes Incentives for:

Home Energy Audit

Insulation; Weatherization

Storm Windows and Doors

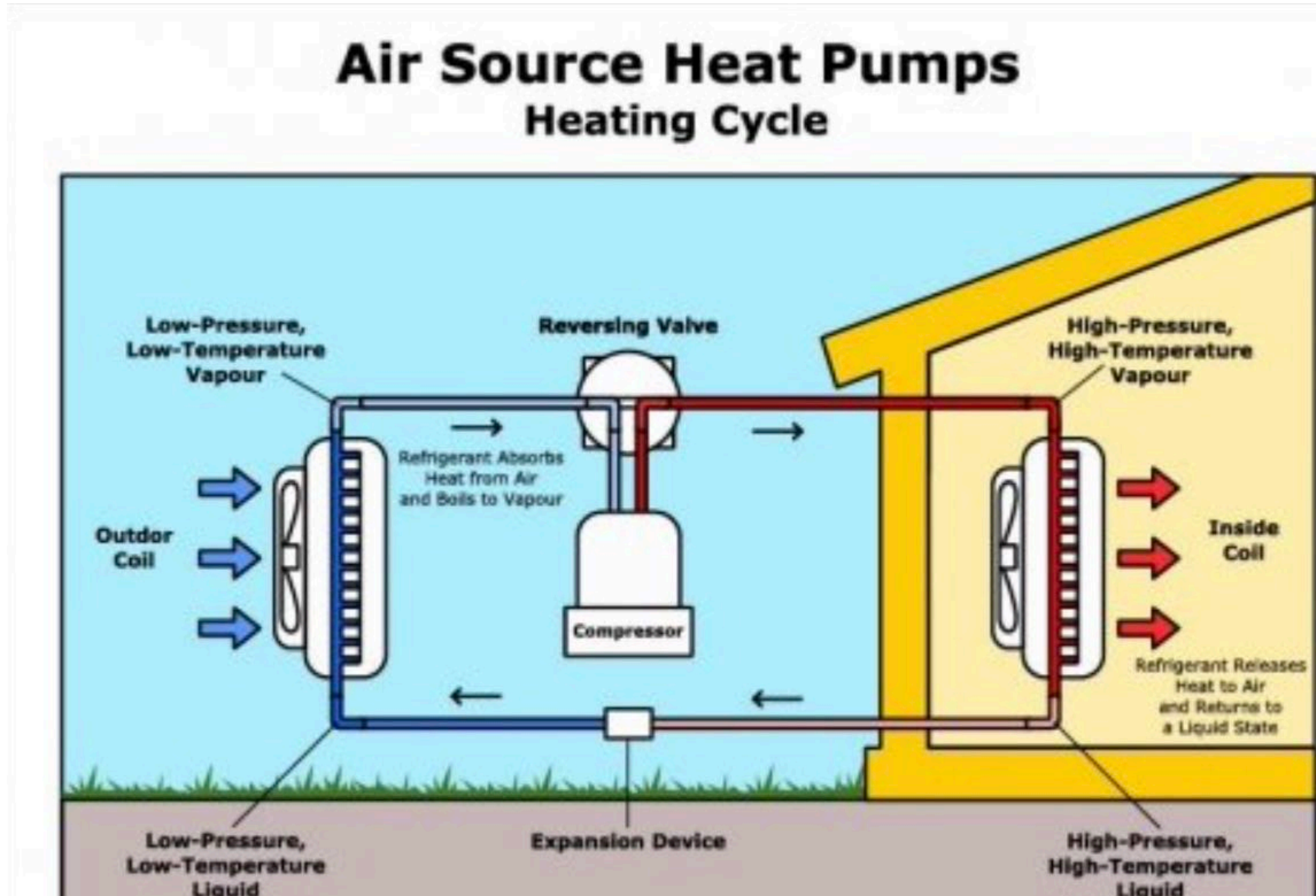


Residential (& Commercial) Energy Efficiency

Heat pumps provide both heating and cooling

No emissions other than source of electricity

Panorama installing these when Independent Living homes are remodeled



Residential (& Commercial) Energy Efficiency: Heat Pump

Lower electricity bill, especially if combined with solar panels;

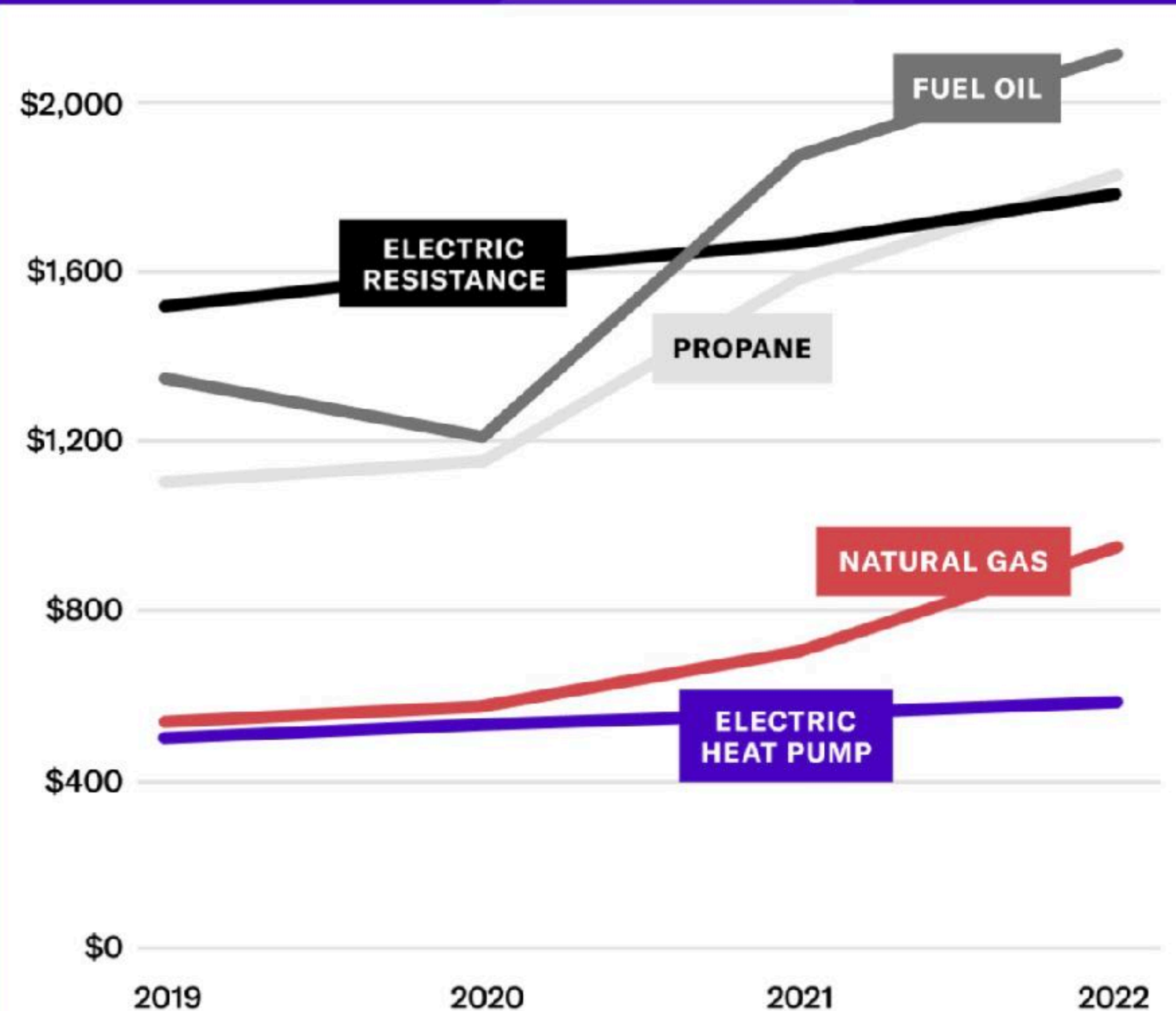
2-3 times more efficient at heating than gas or electricity resistance;

GHG Emissions saved: 5-8 tons/year compared to gas furnace

Household winter heating costs

Going Electric is the best long-term saving solution

REWIRING
AMERICA



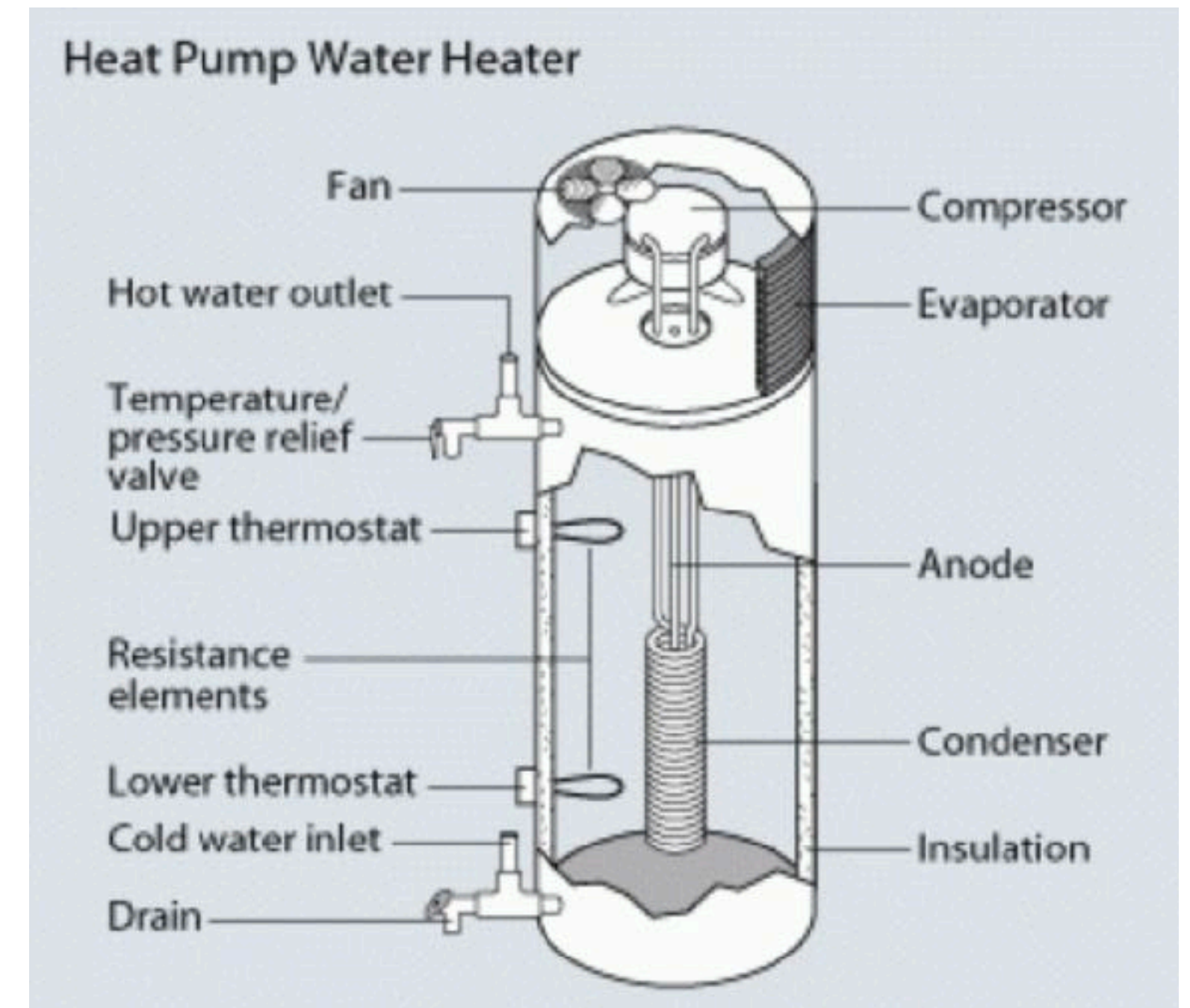
Data on costs by fuel from NEADA's September 12, 2022 release. Electric resistance and electric heat pump costs are disaggregated using data from the EIA's RECS 2020 survey (Table HC6.1) and assuming an HSPF 10 unit.

Residential (& Commercial) Energy Efficiency: Heat Pump Water Heater

Lower electricity bill than electrical resistance heater

Lower GHG emissions than gas, dependent on elect. source

... but longer to heat after large usage



YEARLY OPERATING COSTS AND CARBON EMISSIONS*



HEAT PUMP WATER HEATER

\$120
Energy cost/Yr

0.5 Tons
CO2 Emissions/Yr



GAS WATER HEATER

\$300
Energy cost/Yr

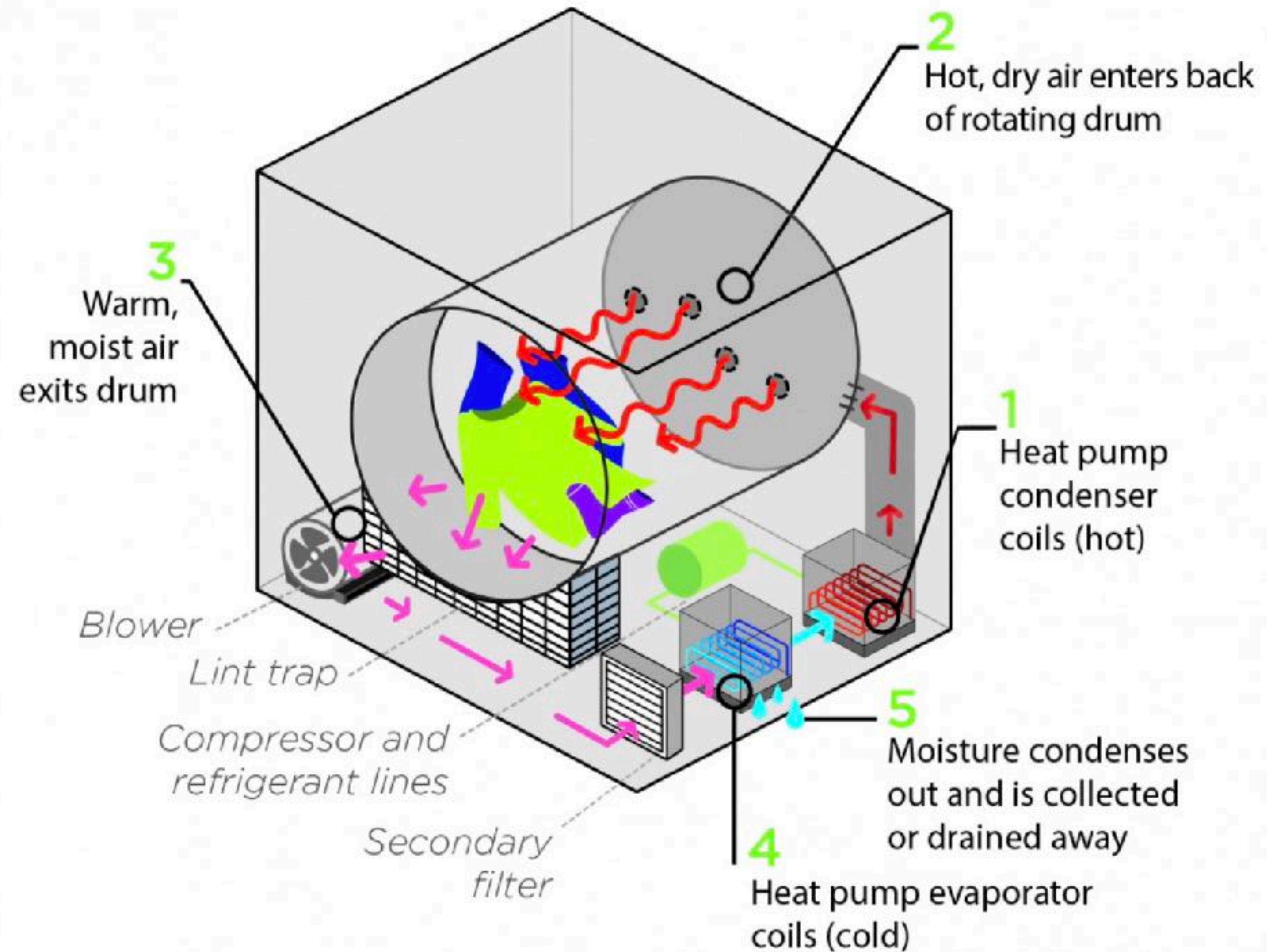
2.3 Tons
CO2 Emissions/Yr

*based on US Federal Trade Commission Energy Guide product labels and Oregon energy data



Residential (& Commercial) Energy Efficiency: Heat Pump Dryer

- 61-72% more efficient than standard dryers;
- Electricity savings: 500 kWh/year = about \$50;
- GHG emission reduction: about 425 lbs/year;
- Operate on 110 volt plug vice 240 volt, thus easier on grid & no costly rewiring to install;
- No venting required,.. install in any room;
- Less fire risk,... runs at lower temp;
- Easier on clothes... (lower temp)



Residential (& Commercial) Energy Efficiency

Electric Induction Cooking

Instant “heat”

Cook faster

Can't burn yourself

Lower electricity bill

No carbon emissions; avoids about 0.5 ton/yr

No explosions

Reduced health hazards (asthma, respiratory)

... but, expensive; may need new cookware



The New York Times; Shutterstock



**25C: Incentivizing
non-LMI consumers to
#electrifyeverything**



25C: Residential Energy Efficiency Tax Credit

Provides 30% tax credit for residential efficiency and electrification upgrades (install included)

Annual credit cap per item for upgrades:

- \$2,000 for heat pumps and heat pump water heaters
- \$1,200 for weatherization
- \$600 for electrical panel (if installed in conjunction)
- \$150 for energy audit
- \$600 for everything else

Total annual credit capped at \$1,200 per household per year (except heat pumps/heat pump water heaters)

Old version of retroactive to 2022; new version starts 2023

Non-refundable

Estimated value: \$12.5B through 2031

HEEHRA: Unlocking electrification for the households that need it most



High-Efficiency Electric Home Rebates (HEEHRA)

Point-of-sale rebates up to \$14,000 for LMI households that install new, efficient electric appliances

- \$8,000 for a heat pump
- \$4,000 for electrical panel upgrades
- \$2,500 for rewiring
- \$1,750 for a heat pump water heater
- \$1,600 for basic weatherization
- \$840 for a heat pump clothes dryer
- \$840 for an electric or induction stove

Costs cover purchase & installation: 100% covered for low income; 50% for moderate income

Includes \$500 contractor incentive

Administered by state energy offices & tribes

\$4.5B budget from 2023–2031

The Future: Electrification vs Fossil Fuels

Advantages of EVs over Gas/Diesel (ICE) Vehicles

ONLY GAME IN WA (and 20 states, 30+ countries)

New cars after 2035 must be “low” or zero-emission

CHEAPER: Lifetime ownership costs

Cheaper to buy - (soon; some already)

Cheaper to maintain - fewer moving parts

Cheaper to drive - 50%-75% less per mile

HEALTHIER:

No particulate matter (PM2.5) or NO2

No gas, oil, catalytic converter, spark plugs, or tailpipe

SLOW DOWN CLIMATE CHANGE - No CO2 emissions;

Avoid emitting 4-8 tons of CO2 annually

EVs are FUN to drive



Source: Olsen family ^



Federal “Clean Vehicle” Credit for EV Purchase

Inflation Reduction Act (IRA) Rules to Qualify (BEVs and PHEVs)

Background:

1. Provides up to \$7,500 tax credit for a **new** EV purchased thru 2032; up to \$4,000 for a **used** EV
2. No cap on number of EVs sold by manufacturer
3. WA State portion of sales tax waived on first \$20,000 of new EV purchase for EV MSRP under \$45,000
4. Tax credit **MAY** be available on purchase **OR** installation of EV charger - 30% on \$1000 max purchase
5. As of 1 Jan 2024, may apply incentive at point/time of sale instead of tax credit at end of year
6. Dual Goal:
 - Climate Change: Reduce greatest source of GHG emissions;
 - National Security: Bring manufacturing back to U.S. & North America;
Reduce supply chain reliance from countries of concern

Bottom Line: If you now have a gas-guzzler, replacing it with an EV is probably the most direct way you can personally reduce your carbon footprint here at Panorama.

Federal “Clean Vehicle” Credit for **New EV Purchase**

Inflation Reduction Act (IRA) Rules to Qualify (BEVs and PHEVs)

To Qualify:

1. Income: < \$300K (joint filers); \$150K (single filer)
2. EV MSRP: < \$80K for SUV, trucks, vans; <\$55K for smaller EVs
3. Final Assembly: North America
4. Critical Minerals: % of Sourcing in U.S. or free trade partners **\$3,750**
5. Battery Components: % manufactured or assembled in North America **\$3,750**

Resulting Tax Credit:

For **\$3,750** tax credit, need items 1 thru 3, plus either 4 or 5

For **\$7,500** tax credit, need all 5 items

Federal “Clean Vehicle” Credit for **Used EV Purchase**

Inflation Reduction Act (IRA) Rules to Qualify (PHEV and BEV)

To Qualify:

1. Income: < \$150K (joint); < \$75K (single or surviving spouse)
2. Sales Price: < \$25K
3. EV Age: > 2 years old
4. Transaction: Sold by a dealer
5. Final Assembly, Critical Minerals, & Battery Components: **NO LIMITS**

Resulting Tax Credit:

\$4,000 or **30%** of the price of the vehicle (whichever is less)

Credit for **Commercial** Electric Vehicles

Inflation Reduction Act (IRA) Rules to Qualify

To Qualify:

No limits on income, MSRP, final assembly, critical minerals, or battery components

Resulting Tax Credit:

For vehicles less than 14,000 pounds: **\$7,500** per vehicle

For vehicles over 14,000 pounds: **\$40,000 max** per vehicle (complicated formula)

Note Loophole: For individuals, **leasing** rather than buying may be best way now to obtain a new EV until manufacturer supply lines are established meeting IRA requirements for tax credit, making larger number of choices available.

Easter Parades on Fifth Avenue, New York, 13 years apart

1900: where's the first car?



1913: where's the last horse?



Source: Rocky Mountain Institute - Tony Seba webinar

Images: L, National Archive, www.archives.gov/research/american-cities/images/american-cities-101.jpg; R, shorpy.com/node/204.
Inspiration: Tony Seba's keynote lecture at AltCar, Santa Monica CA, 28 Oct 2014, <http://tonyseba.com/keynote-at-altcar-expo-100-electric-transportation-100-solar-by-2030/>

Incentives For Providers: Manufacturers, Contractors, Trainers

Manufacturer Investments

Advanced Energy Project Tax Credit - \$10B in tax credits
Defense Production Act \$ 500M in grants (esp. heat pumps)

Low-cost Financing

DOE Loan Programs Office \$40B gov't-backed loan authority
GHG Reduction Fund \$27B to capitalize green banks

Contractor Training

Home Energy Efficiency \$200M for States to develop/implement contractor training

Contractor Incentives

Electrification Rebates (HEEHR) Up to \$500 per qualifying project
Efficiency Rebates (HOMES) \$200 per qualifying project

Incentives for All

Increased demand and competition for market share

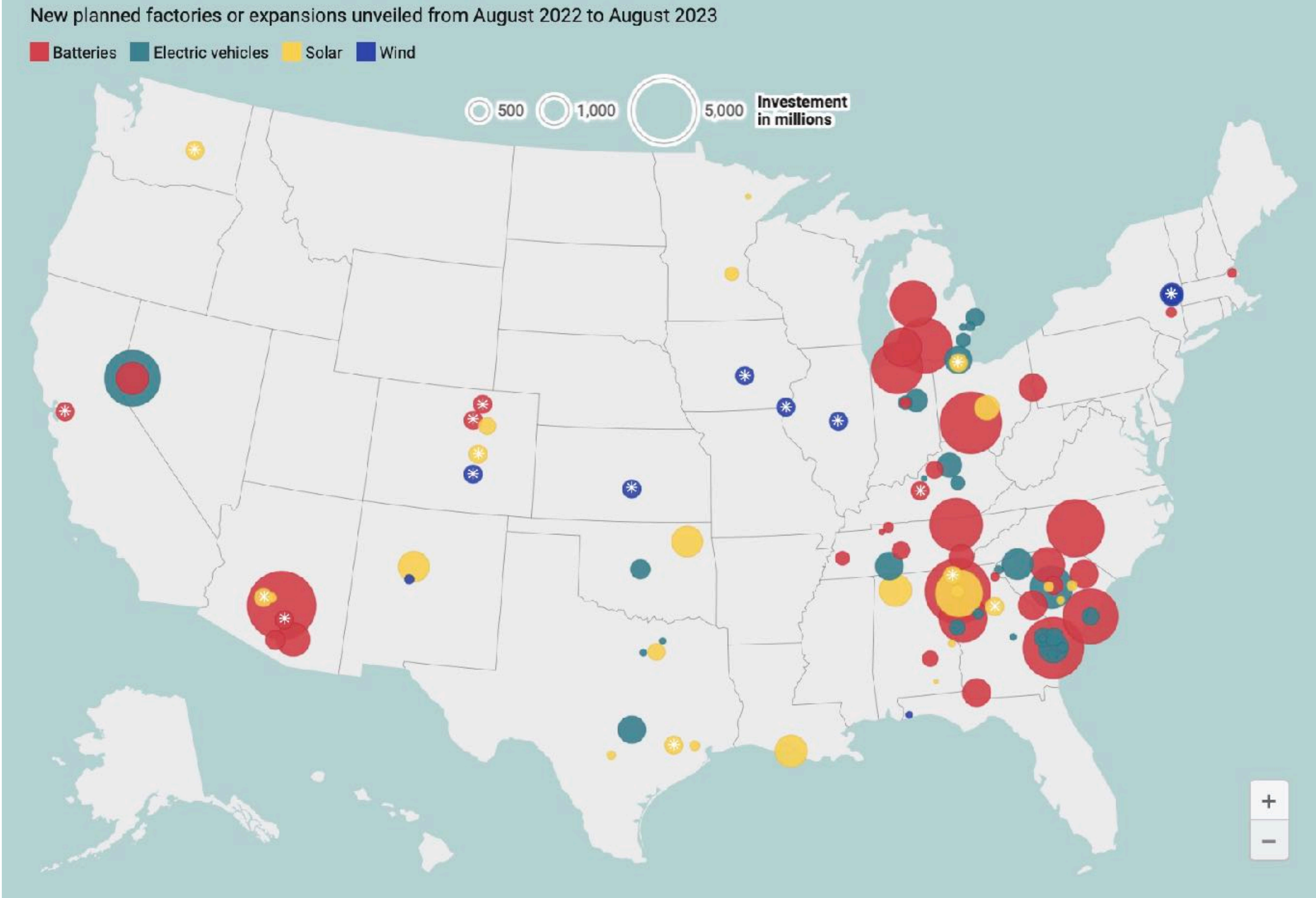
New Investment in First Year of IRA by Energy Sector

Sector	Projects	Est. Jobs	Est. Investments
Electric Vehicles	97	45,911	\$56.1B
Solar	44	15,084	\$9.9B
Battery/Storage	35	8,028	\$12.4B
Wind	18	2,543	\$1.7B
Hydrogen	12	2,434	\$5.1B
Grid/Electrification	12	905	\$1.5B
Biofuels	1	40	N/A
Energy Efficiency	1	200	\$6M
Geothermal	1	N/A	N/A

IRA-Linked Investments in U.S. by Non-U.S. Companies

Country	Projects	Est. Jobs	Est. Investments
South Korea	25	13,515	\$16.6B
Japan	11	3,047	\$9.6B
Germany	10	4,800	\$5.5B
China	6	4,670	\$4.3B
Luxembourg	1	723	\$2.6B
Canada	12	6,965	\$2B
Italy	4	1,227	\$1B
Singapore	1	1,800	\$1B
Norway	4	500	\$669.8M
Switzerland	4	405	\$444M

New Clean Energy Manufacturing Locations - IRA-Related



OVER THE NEXT 15 YEARS, INFLATION REDUCTION ACT CLEAN ELECTRICITY TAX CREDITS WILL:



SAVE U.S. households
\$60 BILLION
in cumulative
ELECTRICITY BILL SAVINGS



DRIVE
\$420–\$467 BILLION
in **CUMULATIVE GDP GROWTH**



ADD
580 GW
of **CAPACITY**
for new clean-
and low-carbon
resources on
the grid



PREVENT
2.9
BILLION TONS
of **CUMULATIVE**
CARBON EMISSIONS
from power sector

DELIVER OVER **\$74 BILLION** IN CUMULATIVE HEALTH BENEFITS, PREVENTING:

9,200
premature deaths



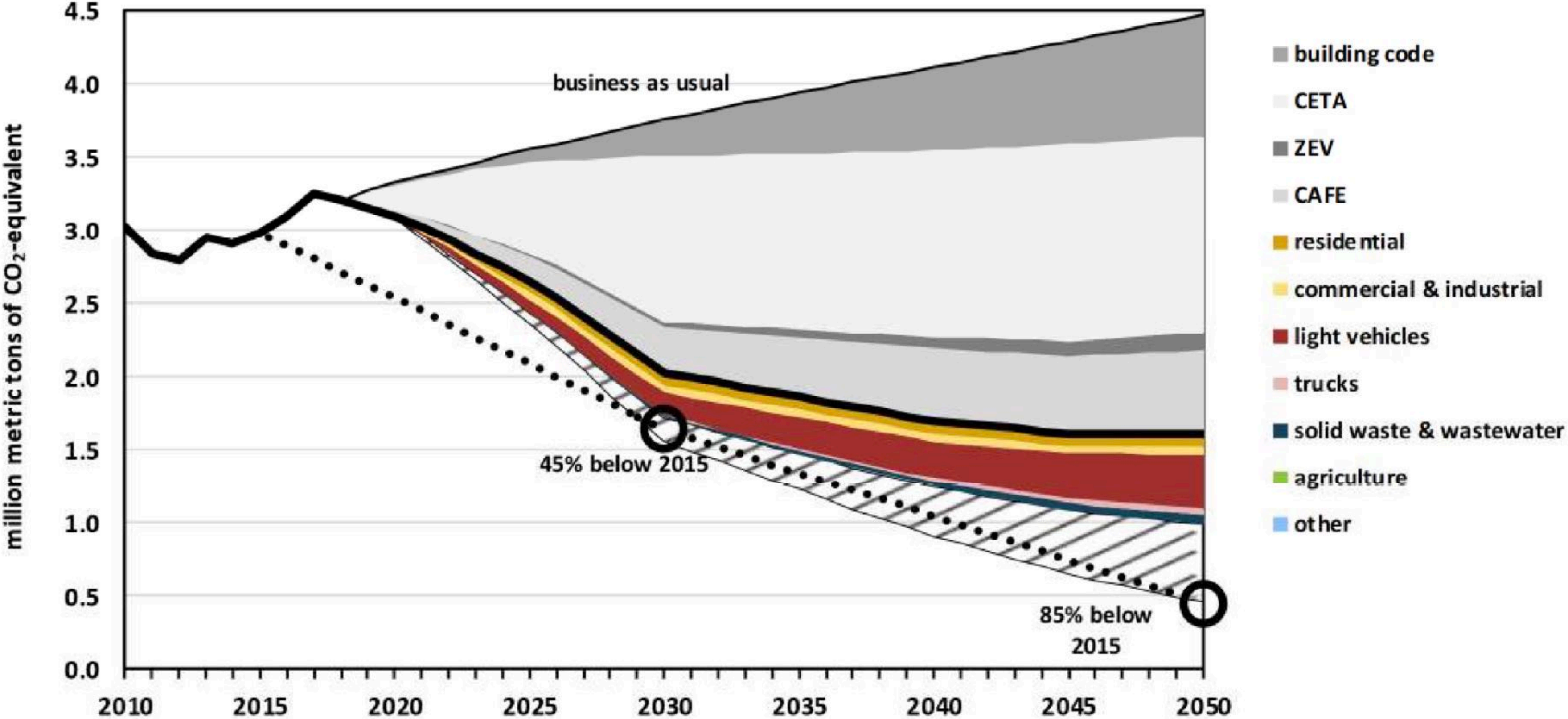
18,700
asthma attacks,
cardiac arrests,
and strokes



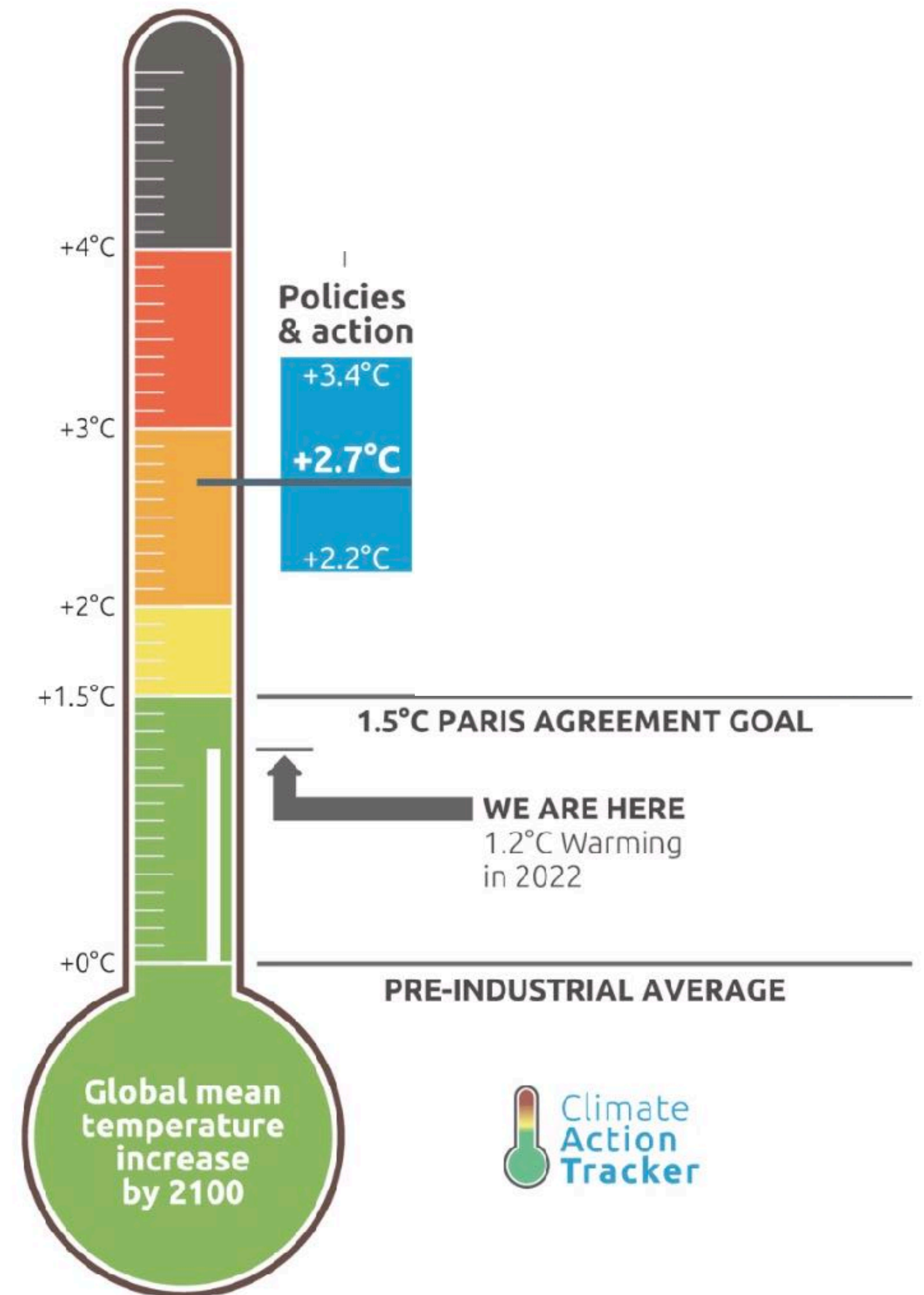
6.1 Million
lost school
and workdays



Thurston Climate Mitigation Plan - Emission Reduction with Washington State Portion in Gray



Impact of Nations' Pledges, Policies, & Actions on Global Temperature Increase: now to 2100



Source:
Climate Action Tracker,
Nov 2022

What's Missing To Accelerate Emission Reduction?

Compromises to Get BIL and IRA Passed:

Carbon Capture & Storage (CCS) and Direct Air Capture (DAC) incentives included;
Liquefied Natural Gas (LNG) pipeline and terminal approvals; continued oil/gas drilling;
Nuclear plant incentives for extended production
“Low” carbon fuel incentives included

Additional Emission Reduction Measures:

Eliminate/reduce existing fossil fuel production subsidies;
Increase cap for specific incentives (i.e., electricity grid; off-shore wind; EV fast charging);
Add more teeth to fix methane leakage problems

Reasons for Optimism vs. Pessimism Regarding Achieving IRA Goal

Optimism

Influx of manufacturing to U.S., esp. EVs;
Rate of EV purchases increasing;
National polls: 2/3 prioritize renewables dvlpmt

Pessimism

Petro-state stranglehold on COP decisions
... resistance to 'phase-out' of fossil fuel;
Russia - Ukraine War; Israel - Hamas War
Resistance of fossil fuel industry and allies;
NIMBYism against wind and solar farms;
UAW Strike;
Nat'l polls: 1/3 prioritize oil/gas development;
"Climate change is hoax" now mantra of
MAGA wing of GOP

The Good, the Bad, and the Ugly

The Good:

- IRA will result in significant cost-of-living savings for those who use it
- IRA will ensure more rapid GHG emissions reduction in the U.S.
- IRA industrial policy strengthens our economy, job market, and national security
- IRA actions strengthen U.S. negotiating position at U.N. COP-28 (Nov-Dec 2023)
- Winners: If goal met, most of us **and our descendants**
- Losers:

The Bad:

- EV transition, electricity grid expansion, offshore wind projects slower than expected
- U.S. (and world) on track to fall short of 2030 goal (50% - 52% GHG reduction)
- COP-28 will make little progress word-smithing international agreement of **specific actions** to achieve net-zero carbon emission goal

The Good, the Bad, and the Ugly

The Ugly:

- Global average temp will likely increase on trajectory to pass thru 1.5C and 2.0C no-go points, nearing a 2.7C increase by 2100. **Temp will continue to increase beyond 2100 until global GHG emissions reach net-zero.**
- U.S. national politics has become bi-polar on subject of climate change. Instead of being based on the science, national climate policy flip-flops with each change of party in power and size/source of campaign donations.
- Repeal of the climate portion of the IRA and other EPA & DOE actions will probably be a 2024 National election campaign issue.

Will We Achieve Our GHG Reduction Goals? What Else Can We Do?

Reduce your own carbon footprint, and help your descendants reduce theirs;

Contact and lobby your federal, state, and local elected leaders;

Speak out at local county and city meetings;

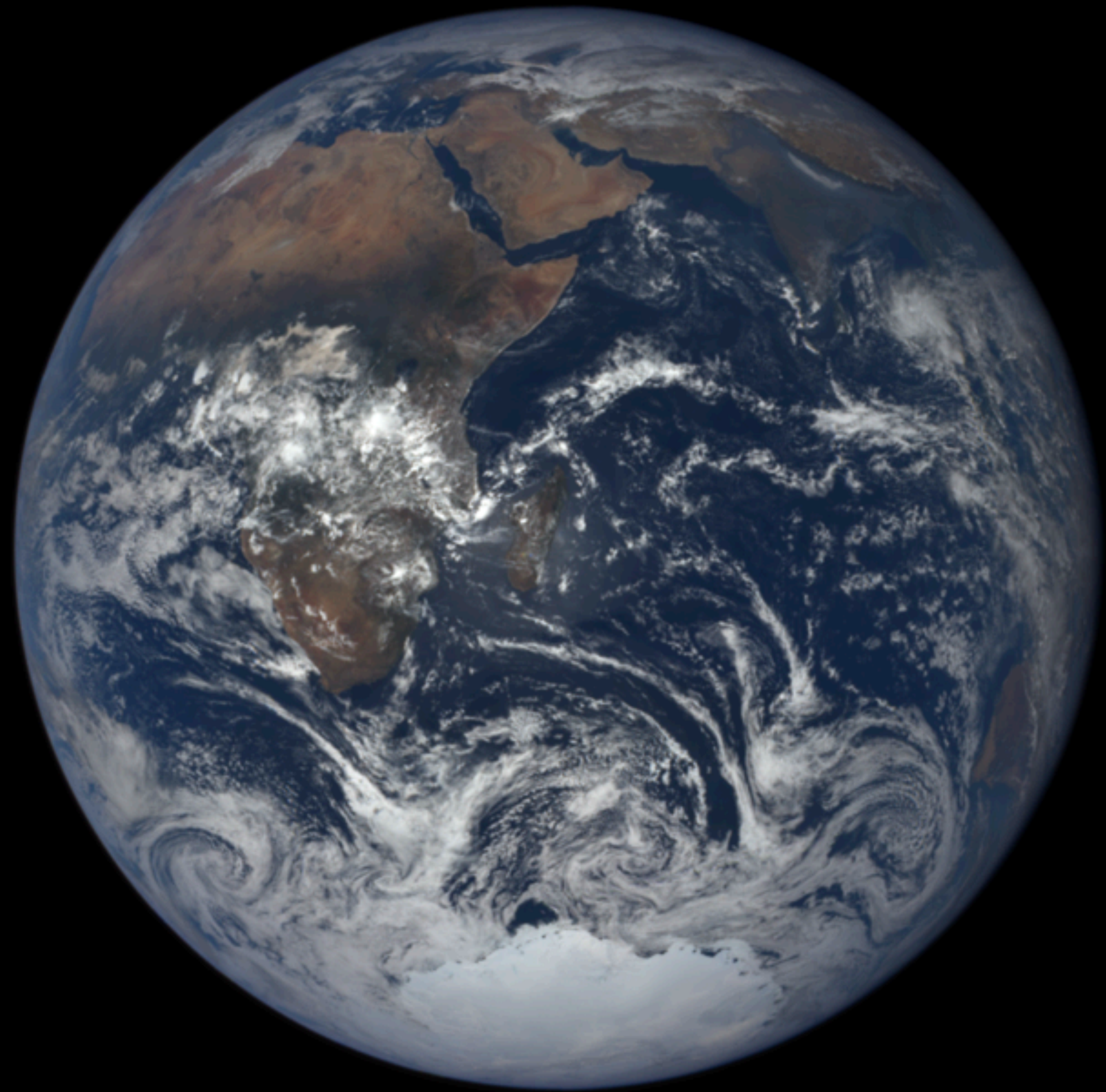
Join local advocacy groups;

Lobby Panorama Management (!)

and

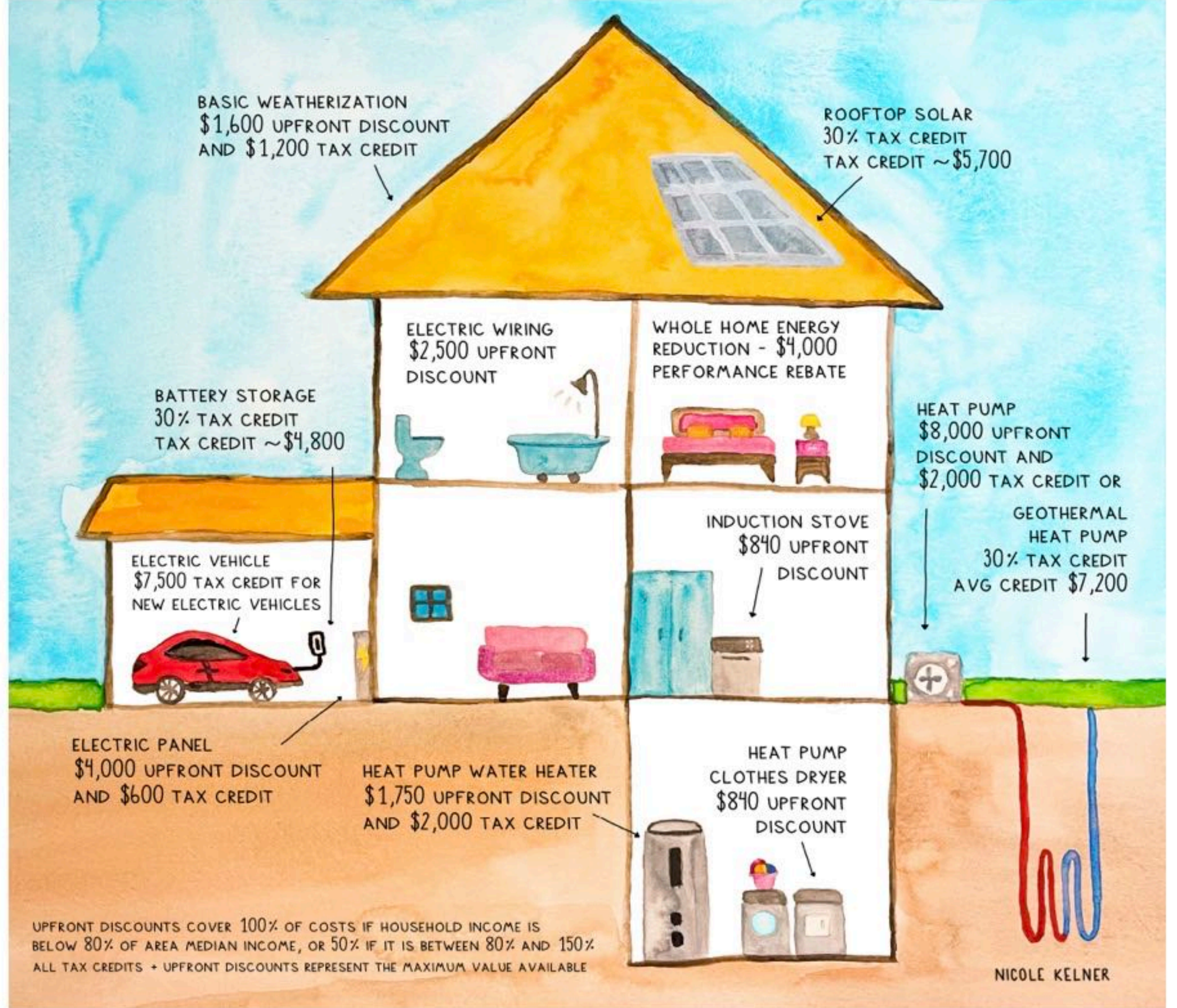
VOTE

...As If Your World Depends On It ...



Your world depends on it.

Q & A



RECOMMENDED CLIMATE AND ENERGY INFORMATION SOURCES
Emphasis on Climate Science Conclusions and Data Available Online

DOE, 2022: Save Energy. Save Money. And Save the Planet Too. <https://www.energy.gov/save>

DOE, 2023: Federal tax credits for plug-in electric and Fuel Cell Electric Vehicles Purchased in 2023 or after. <https://fueleconomy.gov/feg/tax2023.shtml>

Electrify Now, 2022: Empowering everyone to create our clean energy future. <https://electrifynow.net/>

IPCC, 2021: AR6 Climate Change 2021: The Physical Science Basis, WG1 Summary for Policy-Makers. <https://www.ipcc.ch/report/ar6/wg1/#SPM>

IPCC, 2022: AR6 Climate Change 2022: Impacts, Adaptation and Vulnerability, WGII Summary for Policy-makers. https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_SummaryForPolicymakers.pdf

IPCC, 2022: AR6 Climate Change 2022: Mitigation of Climate Change. WGIII Summary for Policy-makers. https://www.ipcc.ch/report/ar6/wg3/downloads/report/IPCC_AR6_WGIII_SummaryForPolicymakers.pdf

IPCC, 2018: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C . <https://www.ipcc.ch/sr15/>

USGCRP, 2017: Climate Science Special Report: Fourth National Climate Assessment, Vol I. <https://science2017.globalchange.gov>

USGCRP, 2018: Fourth National Climate Assessment, Vol II: Impacts, Risks, and Adaptation in the United States. <https://nca2018.globalchange.gov/>

NASA Global Climate Change Website: Vital Signs of the Planet, <https://climate.nasa.gov>

NOAA Climate Website: <https://www.climate.gov/about>

NOAA ESRL Global Monitoring Division, Global Greenhouse Gas Reference Network: Atmospheric CO₂ (Daily Data). <https://www.esrl.noaa.gov/gmd/ccgg/trends/>