

# The Greatest Existential Threat ... Spoiler Alert, It's Not Climate

Sam Rashkin

# Outline

1. The Link Between Building Science and Climate
2. Why Climate is an Existential Threat
3. Smarter Climate Actions and Policies

# Disclaimer

I am not suggesting taking our foot off the climate action pedal.

I am suggesting there is a huge opportunity to be smarter taking climate action.



# Why Climate is an Existential Threat



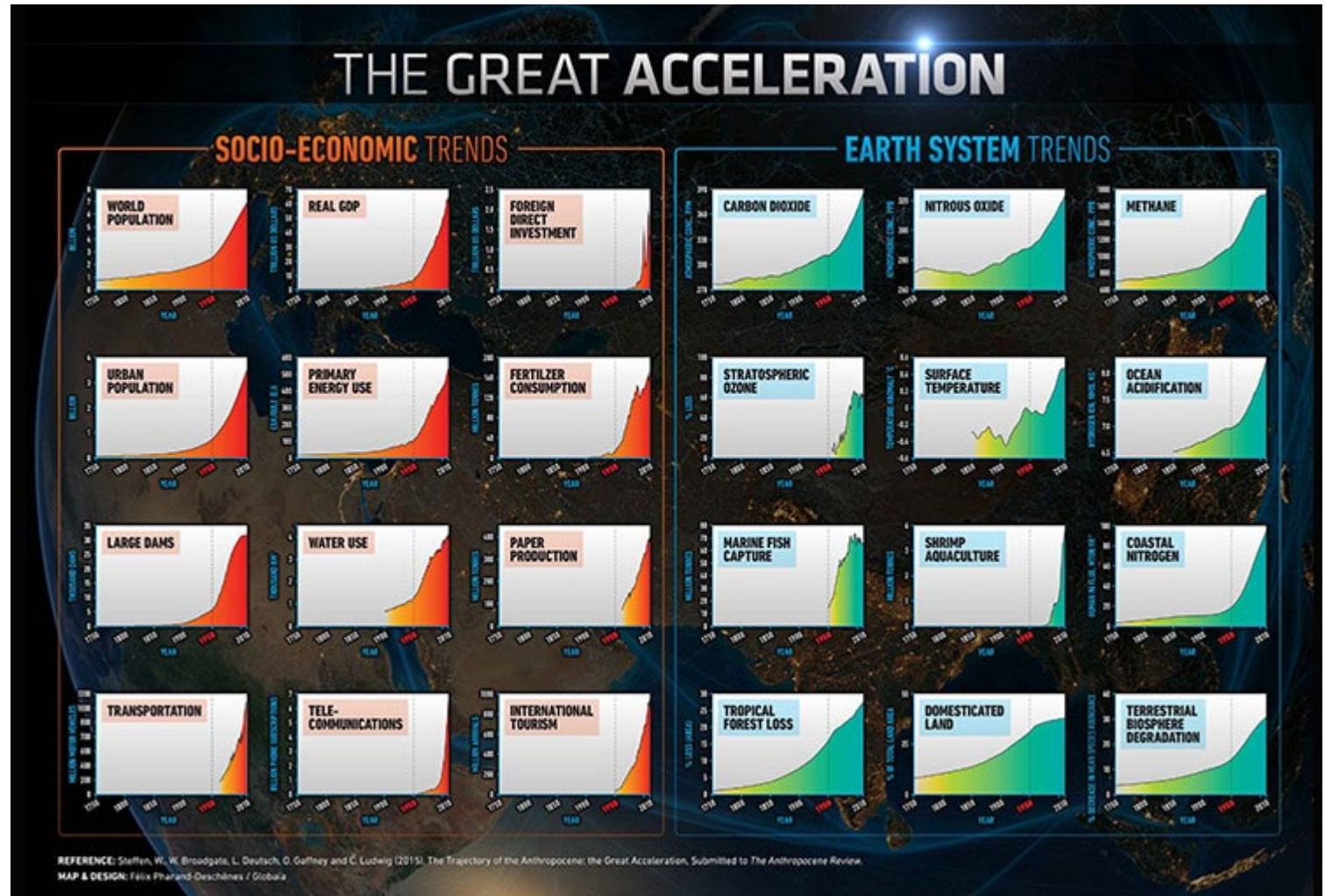
# The Great Acceleration

magnitude and frequency of change indicate that earth has entered a new geologic epoch, the Anthropocene

**Source:** W. Steffen, W. Broadgate, L. Deutsch, O. Gaffney and C. Ludwig (2015), The Trajectory of the Anthropocene: the Great Acceleration, The Anthropocene Review.

March 19, 2024

## Climate: Uncharted Territory



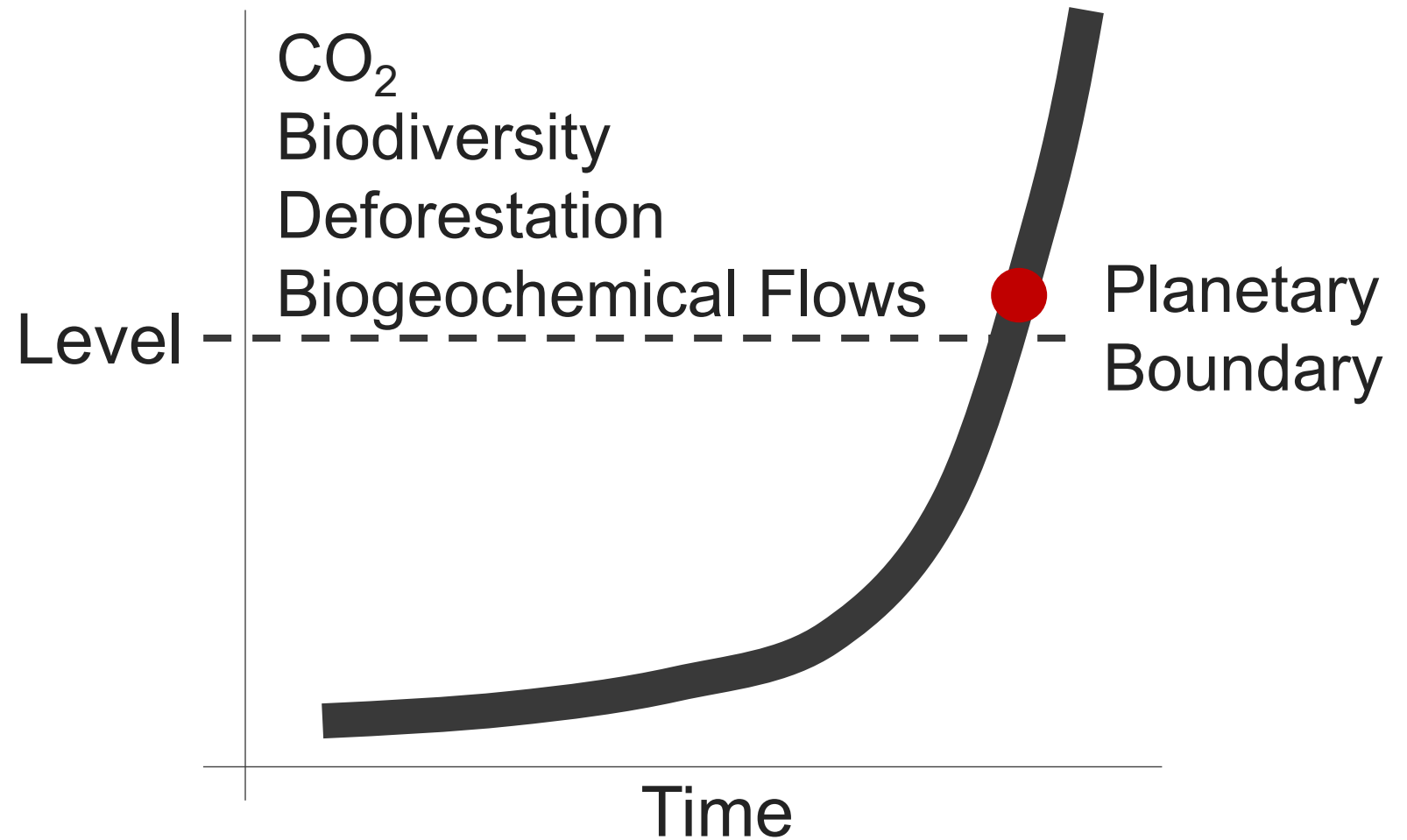
# Last 50 Yrs.

have seen the  
most rapid  
transformation of the  
human relationship  
with the natural world  
in the history of  
humankind.

**Source:** W. Steffen, W. Broadgate, L. Deutsch, O. Gaffney and C. Ludwig (2015), The Trajectory of the Anthropocene: the Great Acceleration, The Anthropocene Review.

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## Climate: Uncharted Territory



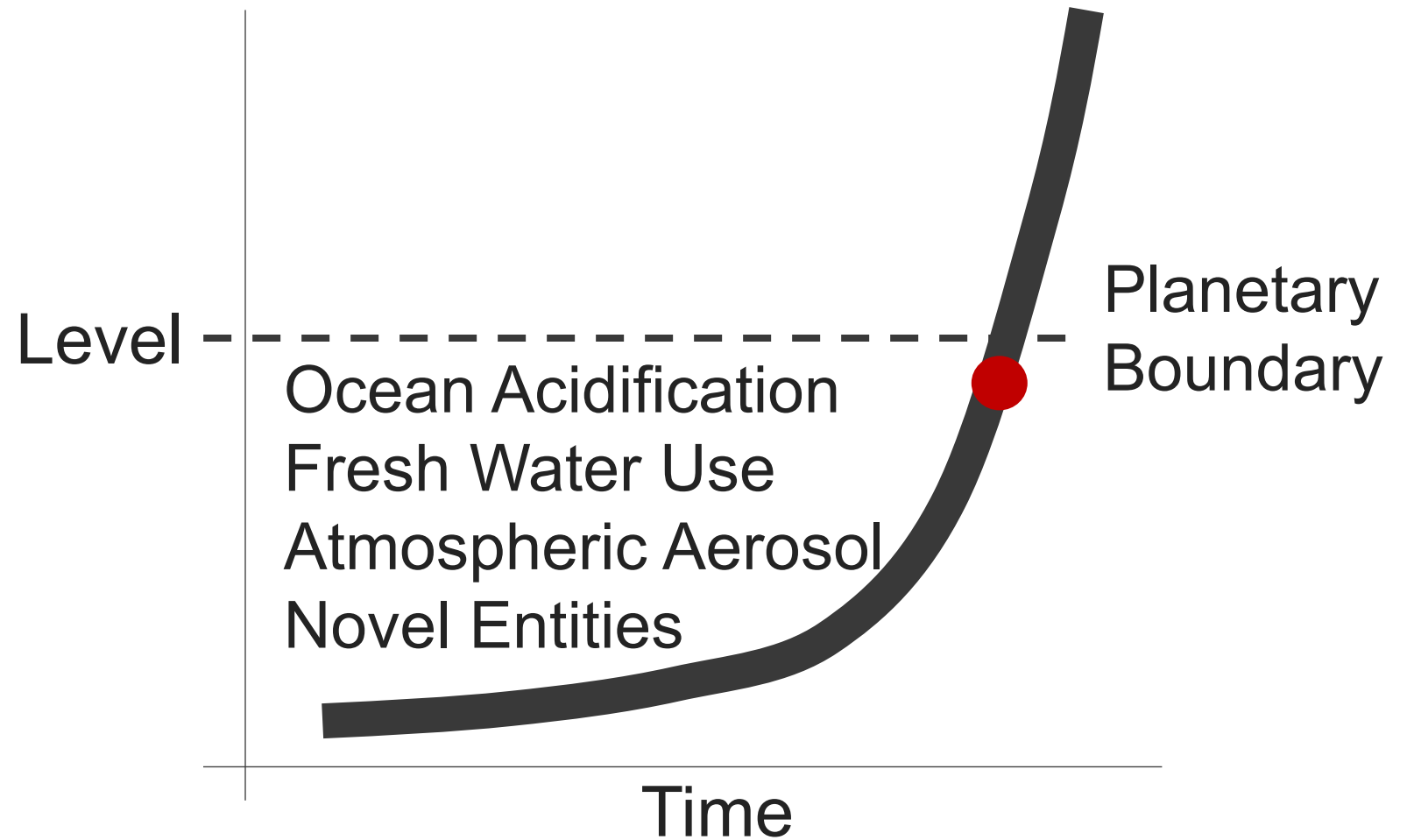
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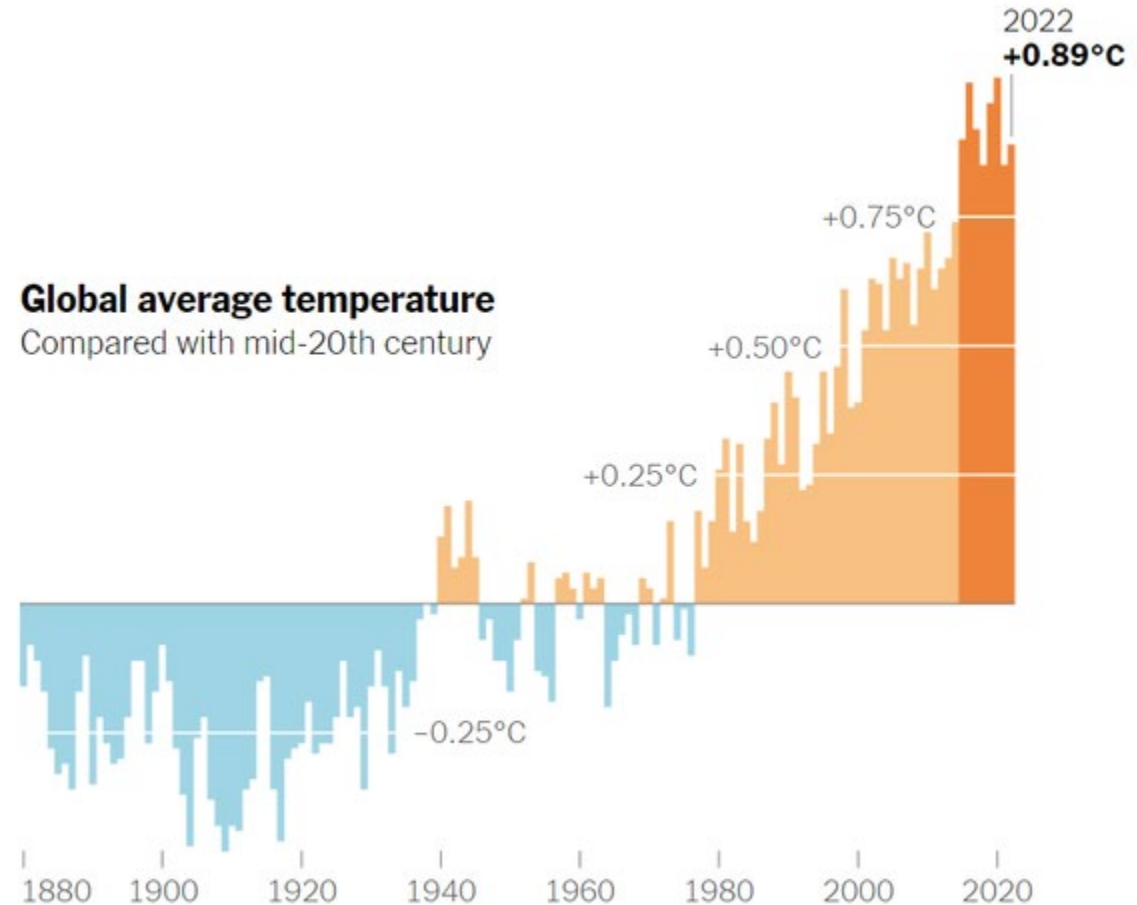
## Climate: Uncharted Territory



**Last 8 Yrs.**  
hottest on record

Source: NASA, 2023

## Hard Trend: Temperature Rise



Source: NASA Goddard Institute for Space Studies, 2023

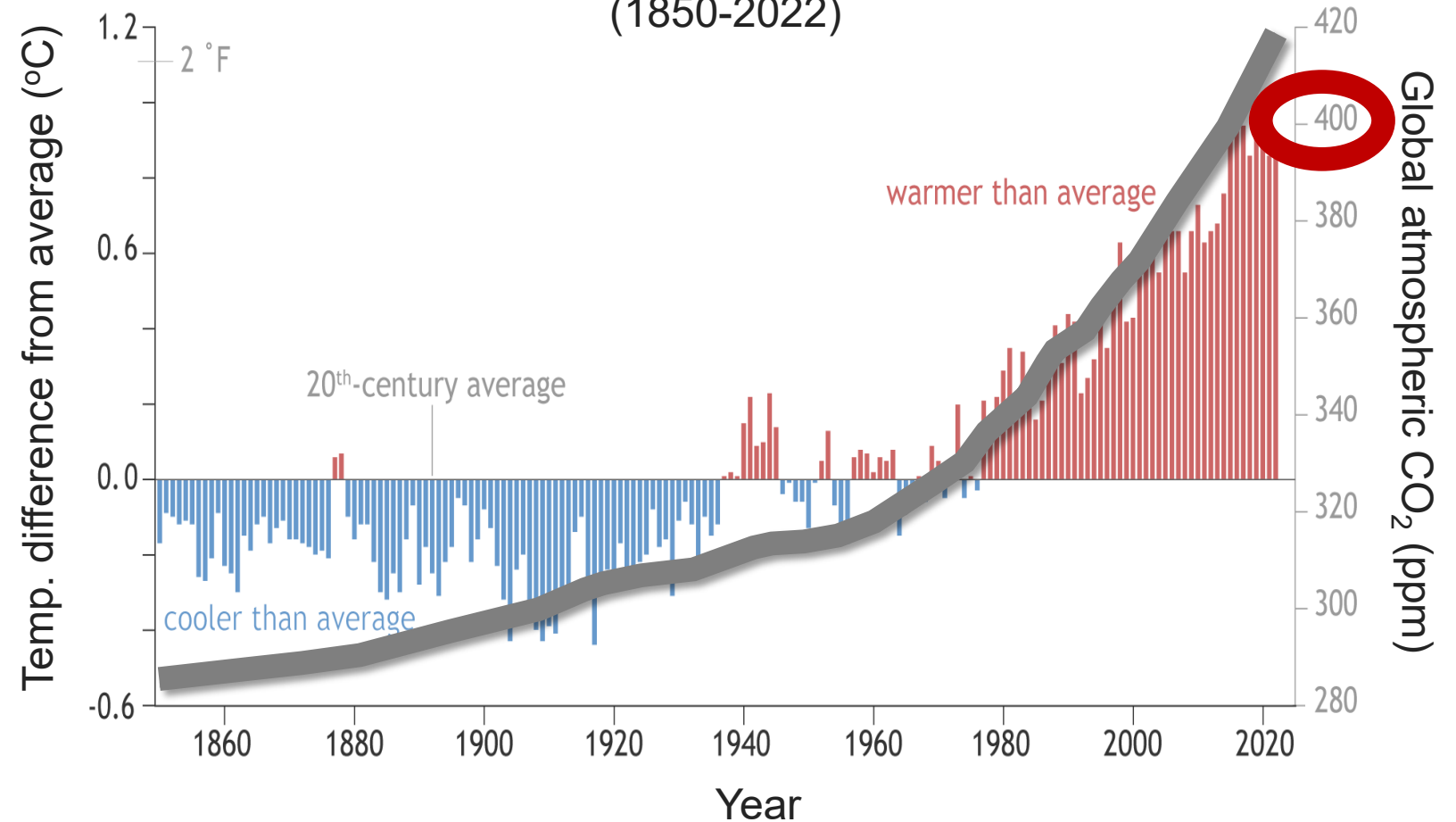


**150%**  
rise in CO<sub>2</sub> since  
its value in 1750

Source: NASA, 2023

## Hard Trend: Atmospheric CO<sub>2</sub>

Yearly Global Surface Temperature & Atmospheric CO<sub>2</sub>  
(1850-2022)



Source: NOAA Climate.gov

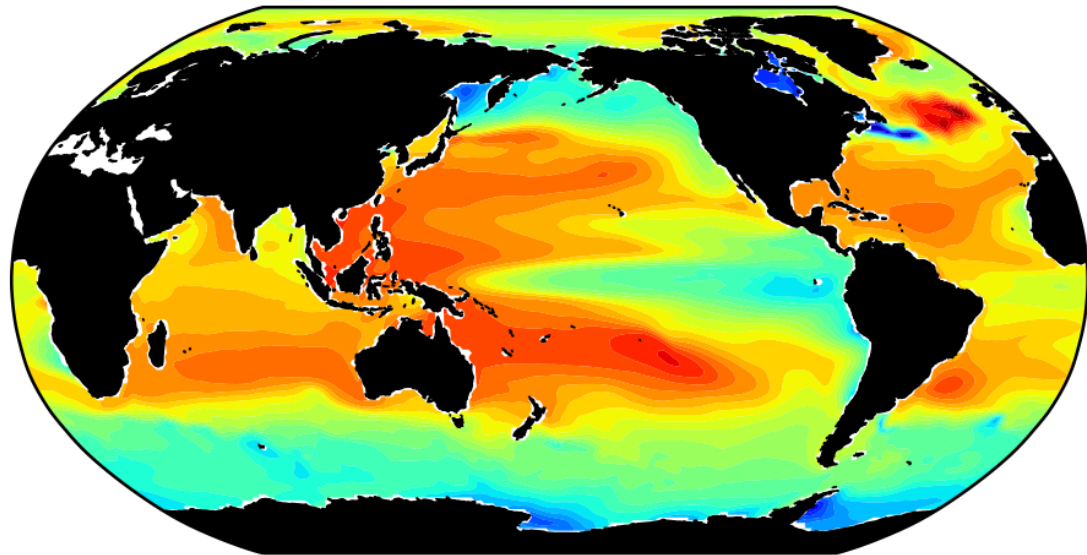
**Last 10 Yrs.**  
ocean's warmest  
decade since at  
least the 1800s

Source: NASA, 2022

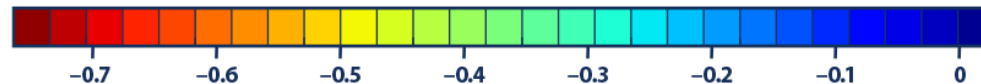
# Hard Trend: Ocean Warming

## Global Warming's Evil Twin

Changes in Aragonite Saturation of the World's Oceans, 1880–2015



Change in aragonite saturation at the ocean surface ( $\Omega_{ar}$ ):



Data source: Woods Hole Oceanographic Institution. 2016 update to data originally published in: Feely, R.A., S.C. Doney, and S.R. Cooley. 2009. Ocean acidification: Present conditions and future changes in a high- $\text{CO}_2$  world. *Oceanography* 22(4):36–47.

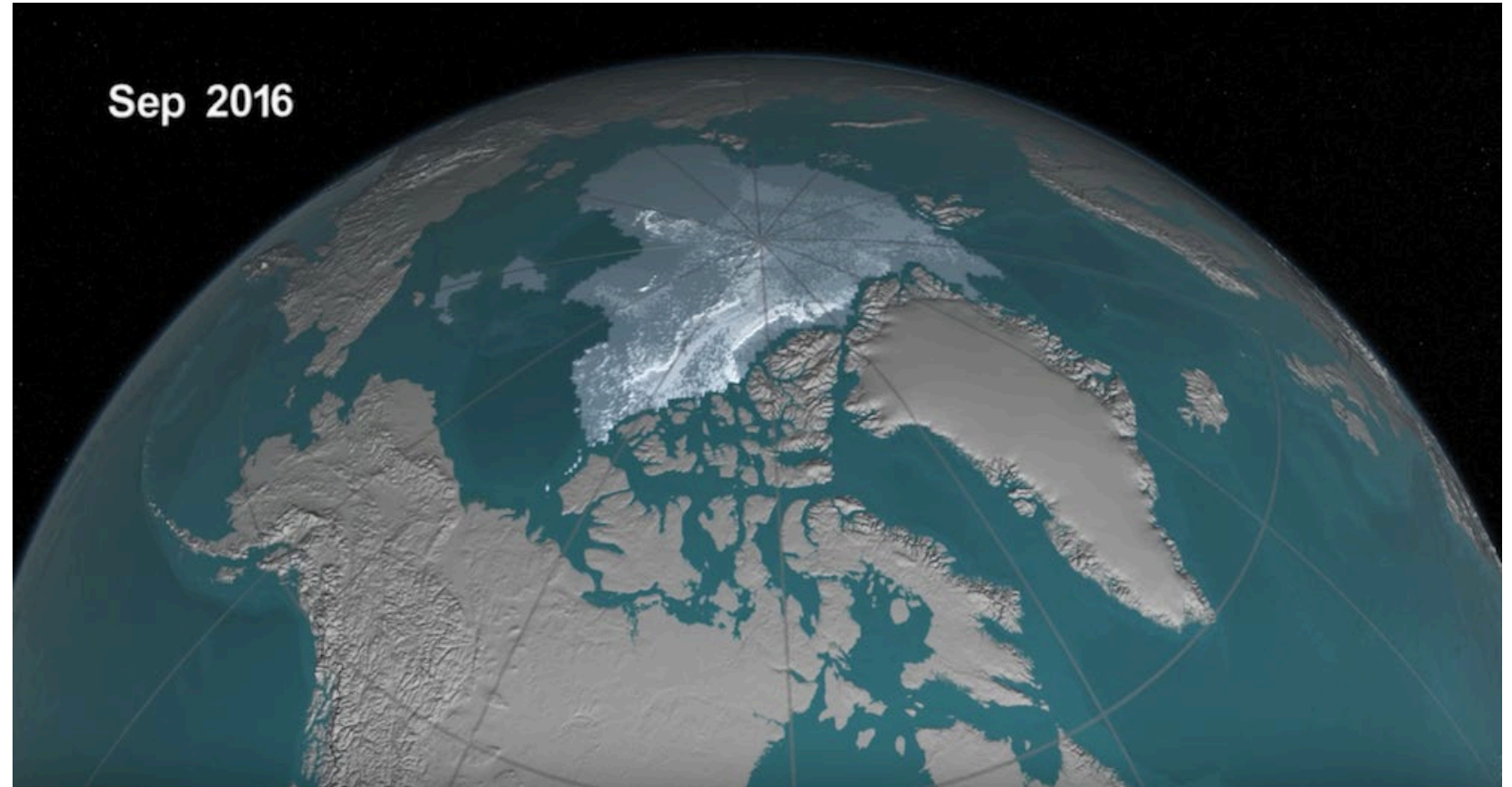
For more information, visit U.S. EPA's "Climate Change Indicators in the United States" at [www.epa.gov/climate-indicators](http://www.epa.gov/climate-indicators).

# Hard Trends: Sea Level Rise

**3X**

faster sea level rise  
estimated in next  
30 years (one foot)  
compared to past  
100 years

**Source:** NOAA, Feb. 2022

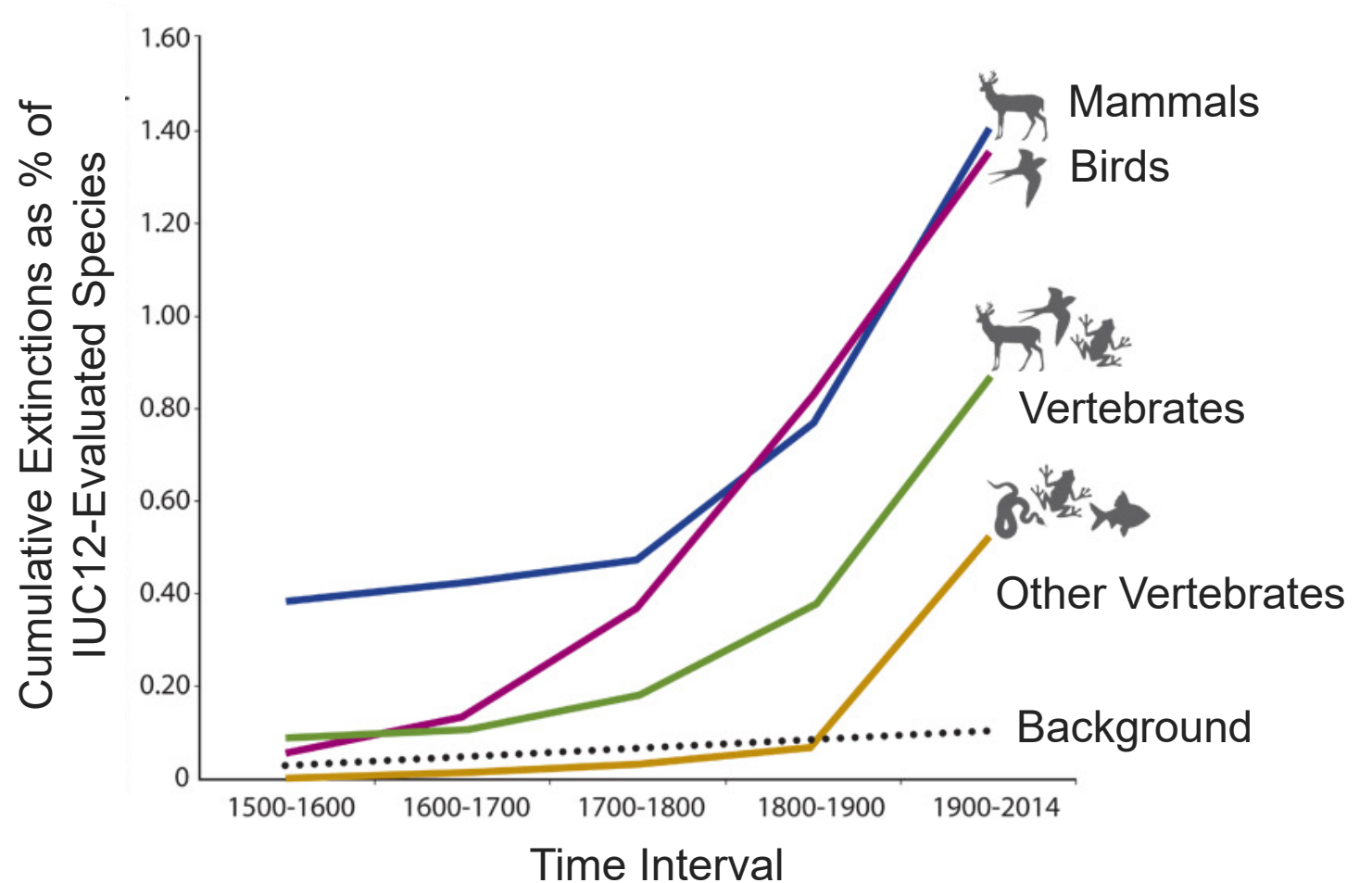


**Source:** NASA Goddard Institute

**30 - 50%**  
of species going  
extinct by 2050,  
(1,000 to 10,000  
faster than normal  
background rate)

**Source:** *"The Extinction Crisis,"* Laura Ferguson, Tufts University, May 21, 2019

## Hard Trend: Biodiversity



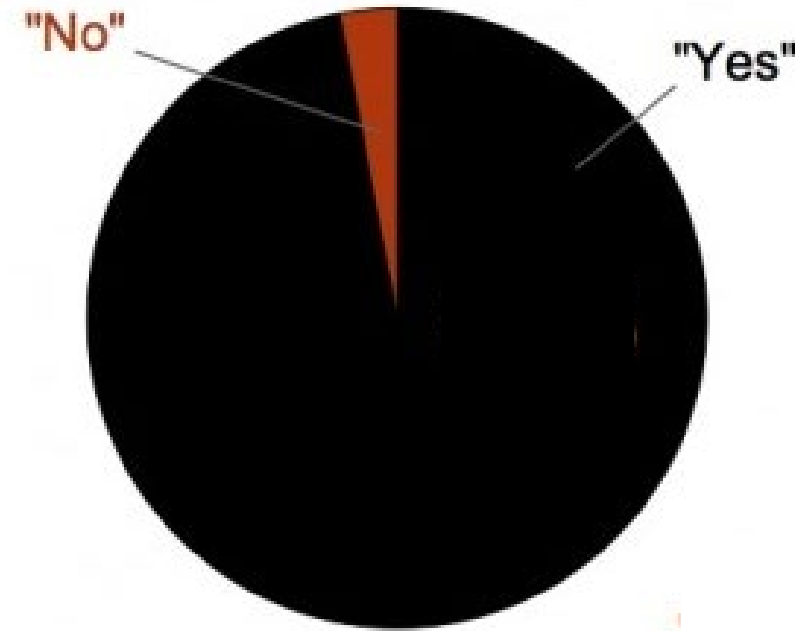
**Source:** Science Advances, 'Accelerated modern human-induced species losses: Entering the sixth mass extinction,' June 19, 2015

**97%**  
percent of climate  
scientists say  
climate change is  
happening and  
human caused

**Source:** *"Climate Change in the American Mind: Americans' Global Warming Beliefs and Attitudes in May 2011."* Yale Project on Climate Change Communication, 2011

## Hard Trend: Near Consensus

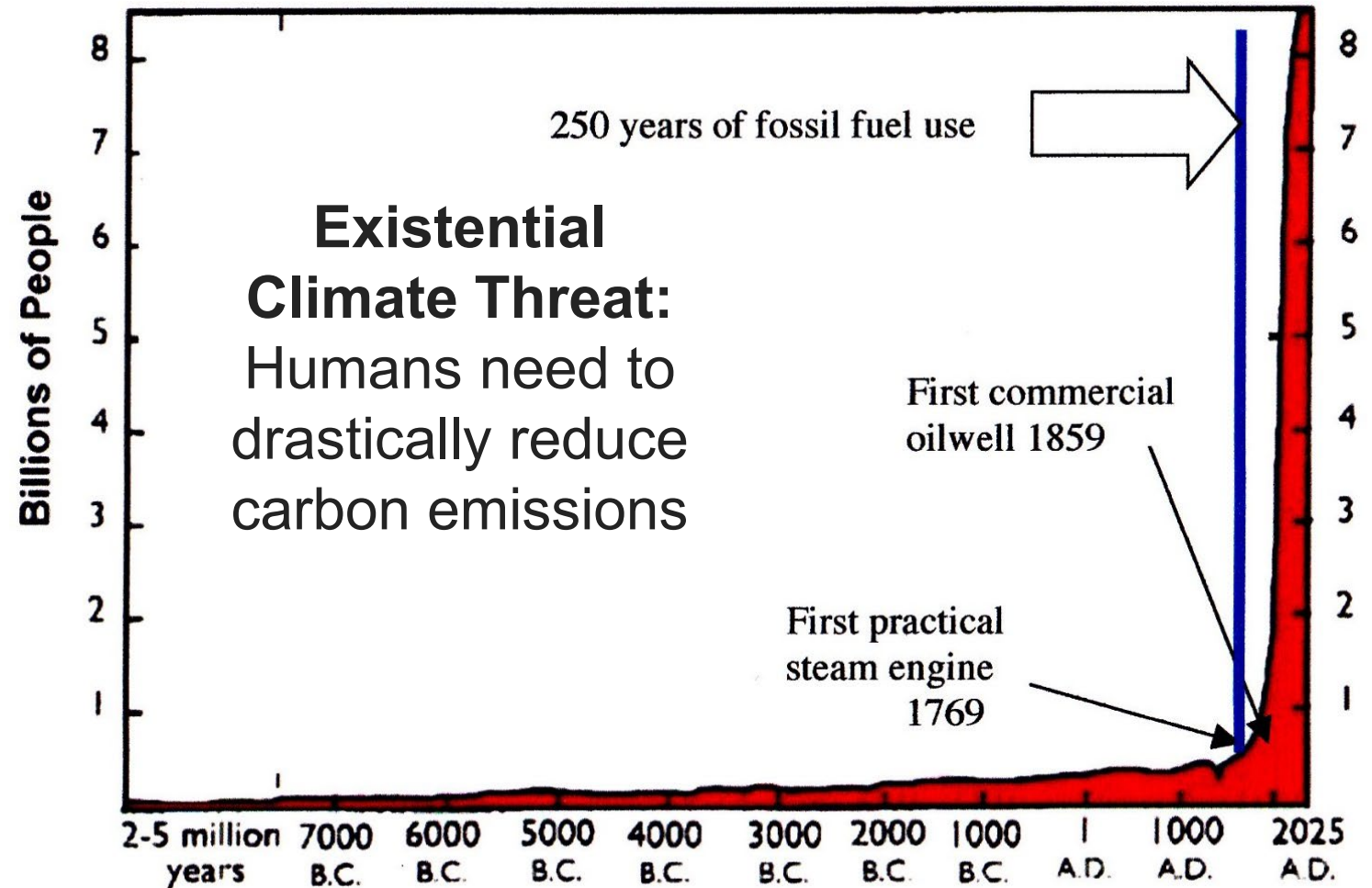
### Percent Climate Scientists Who Say Climate Change is Happening and Human Caused



**1<sup>st</sup> Billion:**  
300,000 years

**5<sup>th</sup> & 6<sup>th</sup> Billion:**  
12 years

## Hard Trend: Population Growth







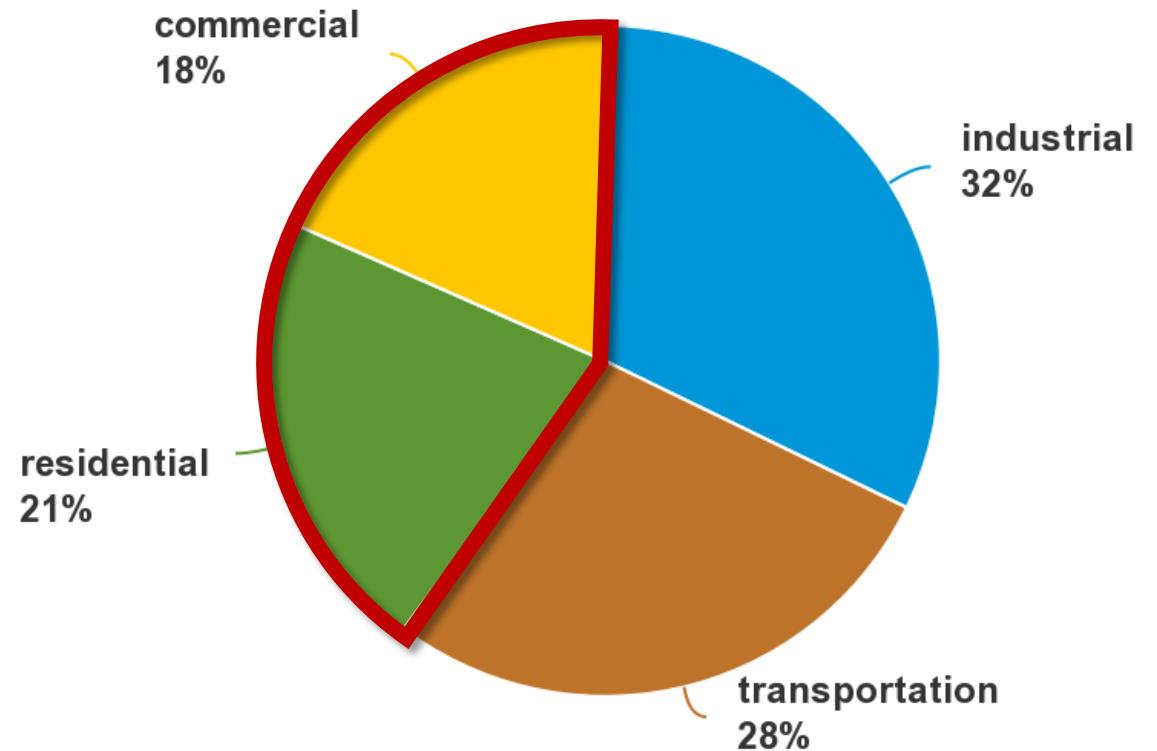
# The Link Between Building Science and Climate

# Energy Use by End-Use Sectors in the U.S.

Share of total U.S. energy consumption by end-use sectors, 2018

Total = 101.3 quadrillion British thermal units

**~40%**  
percent of total  
U.S. energy  
consumption is for  
buildings

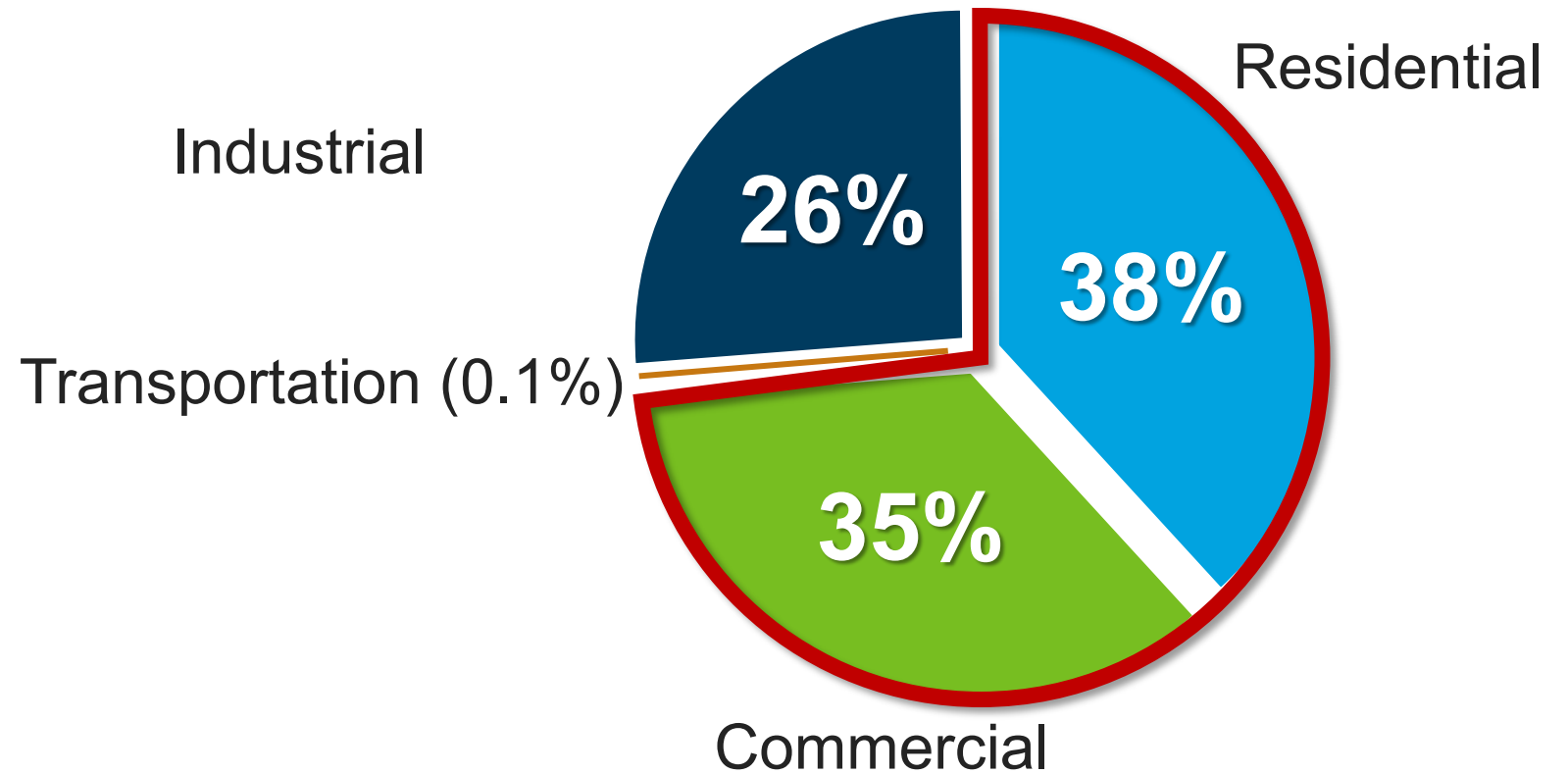


Source: EIA, 2019

**~75%**  
percent of total  
U.S. electricity  
consumption is for  
buildings

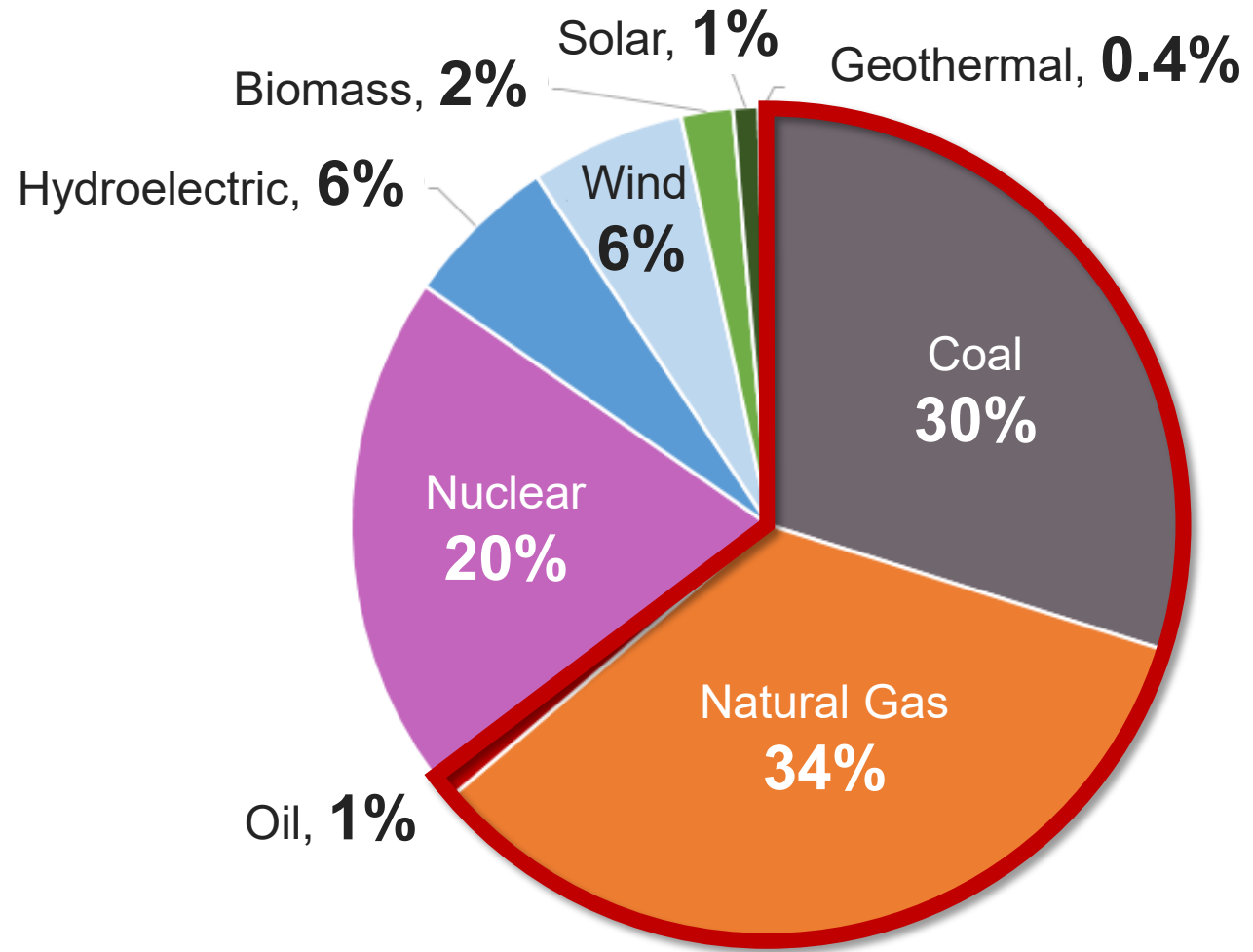
## Electricity Use in the U.S.

### Electricity Use by Sector



**Source:** EIA, 2023

# Electricity Generation in the U.S. by Source



Source: EIA, 2017

**~65%**  
percent of total  
U.S. electricity  
generation is from  
fossil fuels

# Conclusion

Low-carbon buildings are critical  
to meeting climate goals

## Moisture Risks:

- More Wetting Potential
- Less Drying Potential

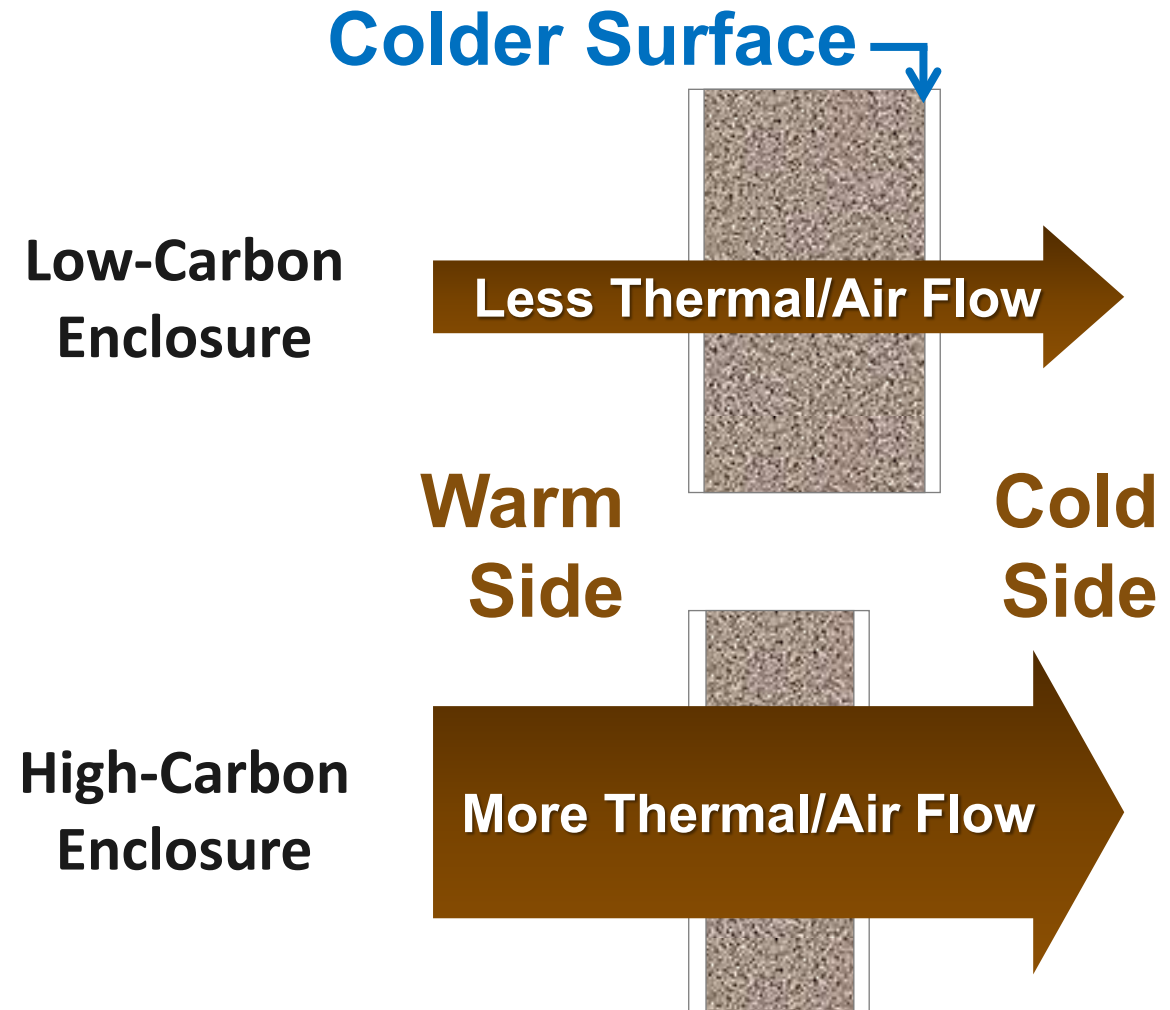
## Comfort Risks:

- Low Air Flow
- Shorter Cycles
- Longer Swing Seasons

## IAQ Risks:

- Less Dilution

# Building Science Critical to Low-Carbon Buildings That Work







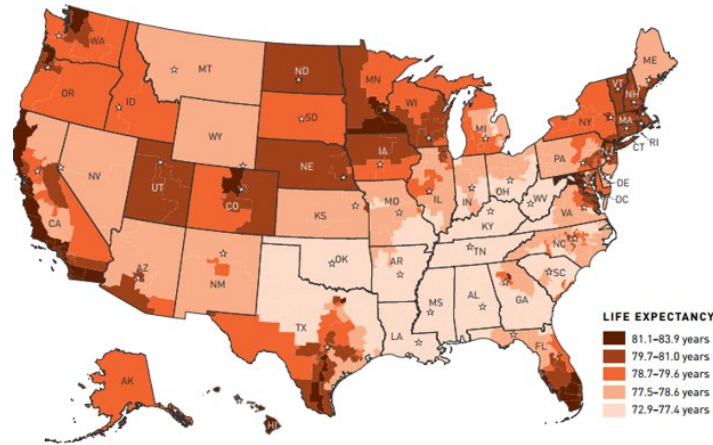
# Why Climate is NOT the Greatest Existential Threat

# Well-Being Measured

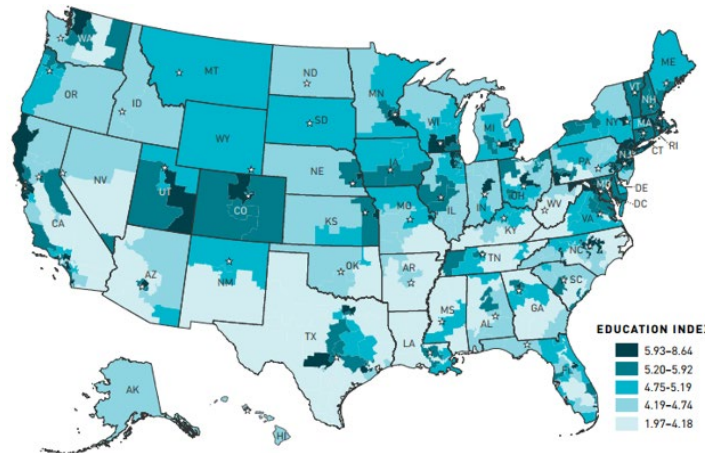
- **Life Expectancy**  
[likelihood of a long and healthy life]
- **Education**  
[access to knowledge based on school enrollment and education degree attainment]
- **Median Earnings**  
[standard of living for full- and part-time workers]

# Well-Being Results by Congressional District

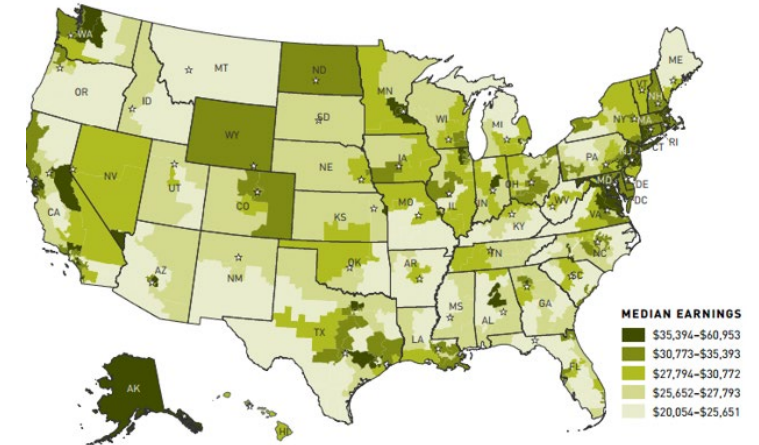
## Life Expectancy



## Education Index



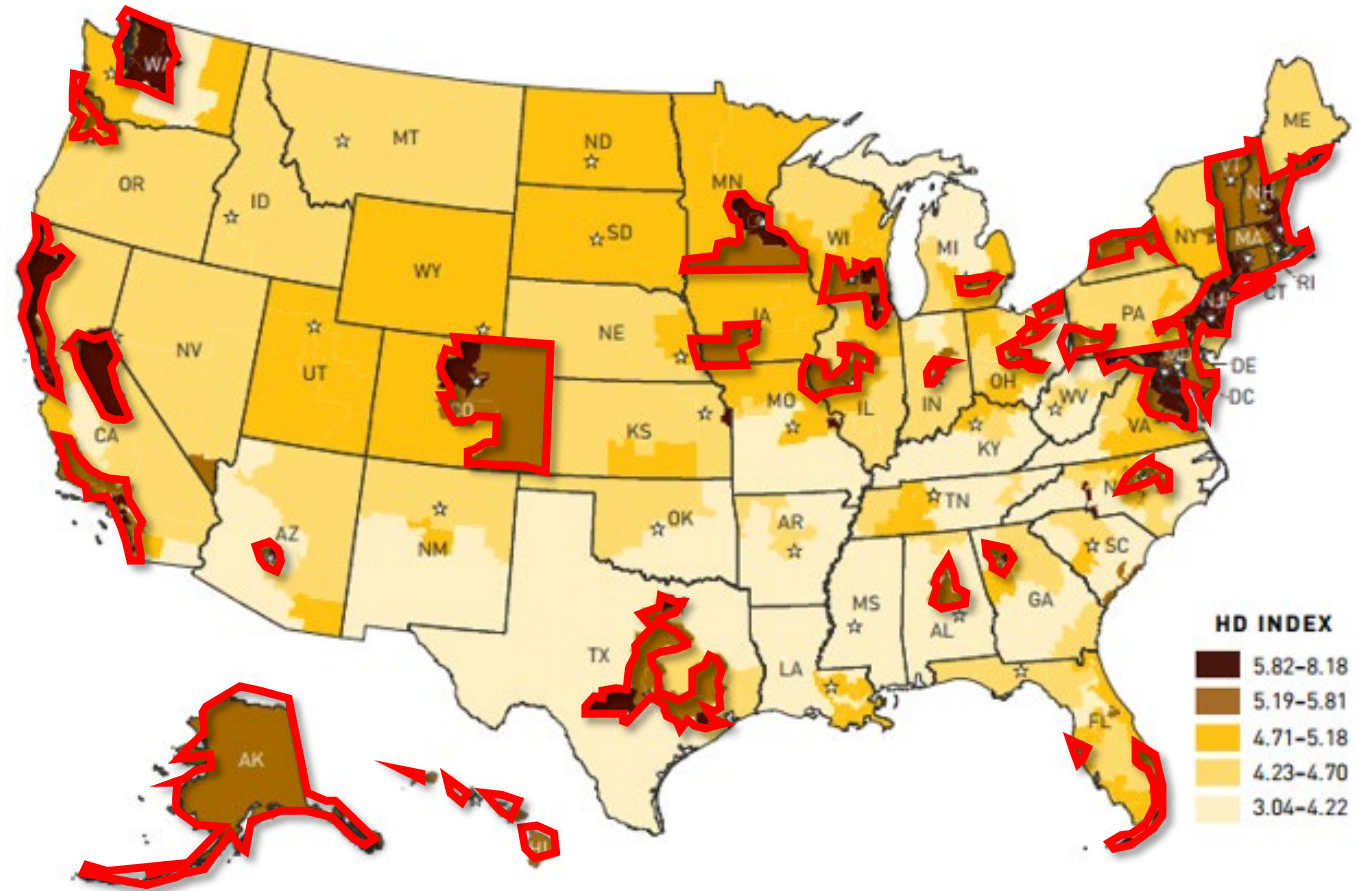
## Median Personal Earnings



**Source:** “*Measuring America: 10 Years and Counting*,” Measure of America of the Social Science Research Council, 2018

# Well-Being Results: Human Development Index

**2X**  
gap in well-being  
from lowest to  
highest regions

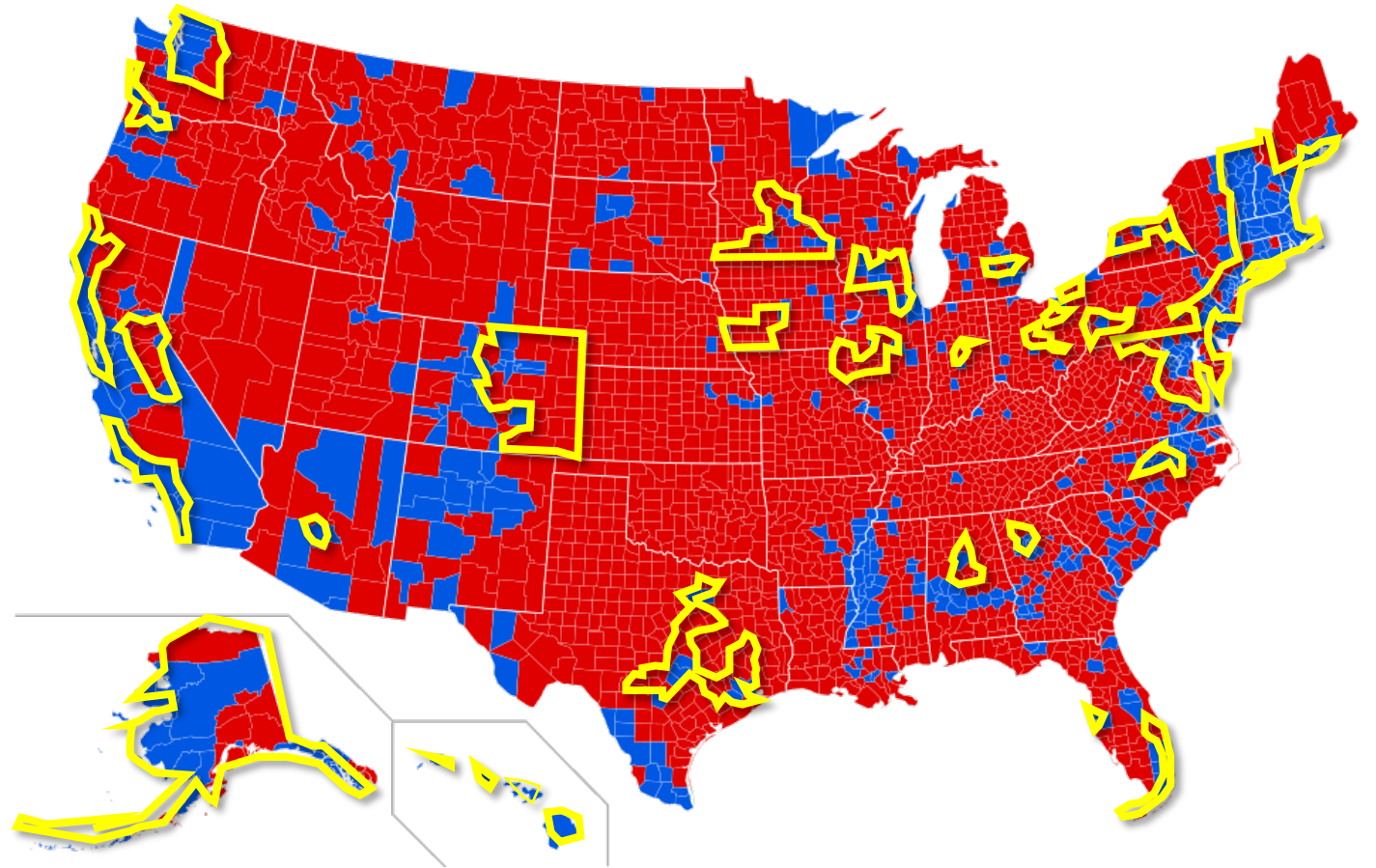


**Source:** “Measuring America: 10 Years and Counting,” Measure of America of the Social Science Research Council, 2018



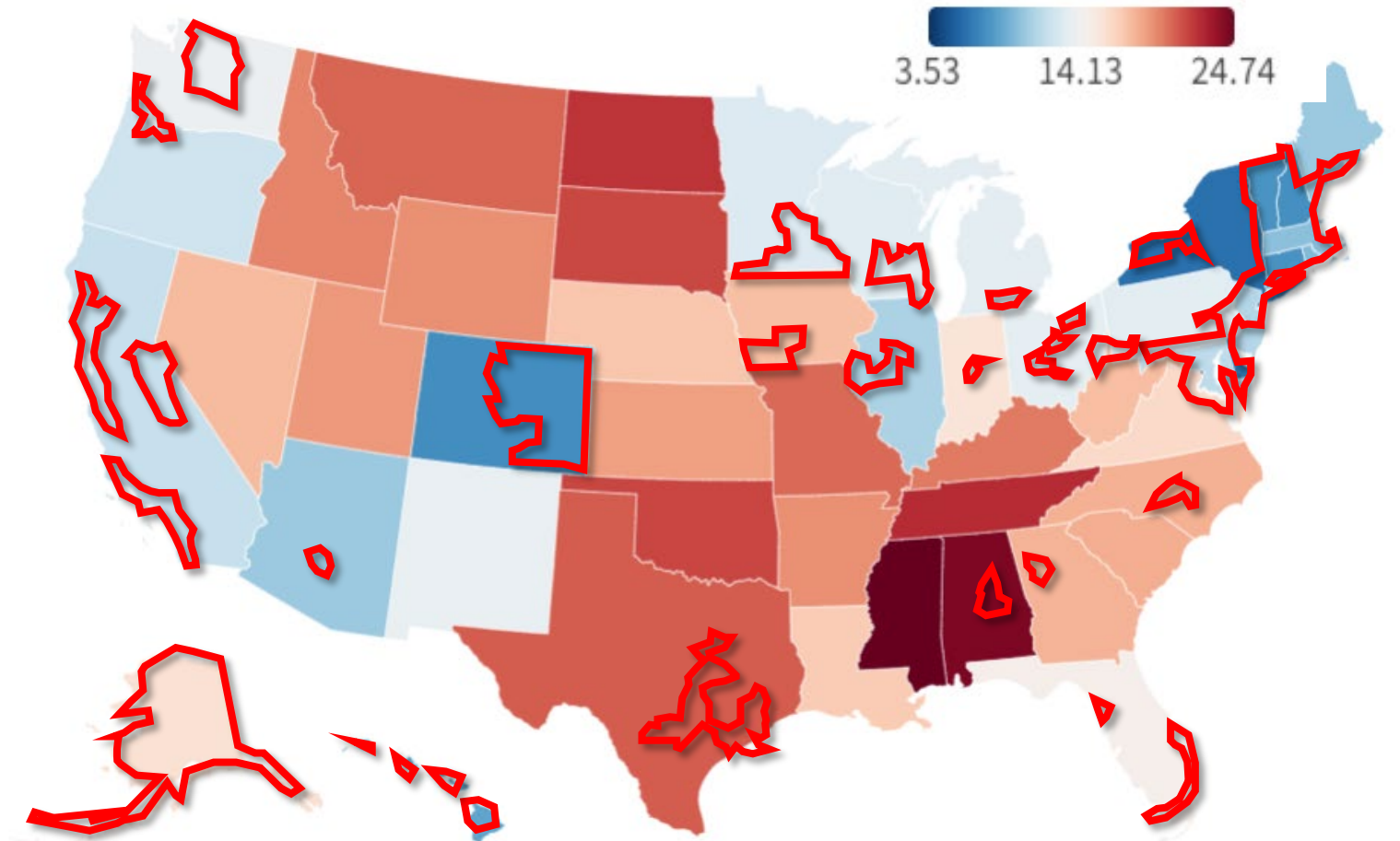
# Well-Being Results with 2020 Presidential Election Results:

**High  
Correlation**  
between areas of  
high well-being  
and support for  
climate protection  
leadership



**High  
Correlation**  
between areas of  
low well-being and  
climate deniers

## Where Climate Change Deniers Live:



**Source:** *"The Social Anatomy of Climate Change Denial in the United States,"* Gournaridis, Newell, University of Michigan, 2024



# \$1 Billion

Spent by five largest  
oil companies on  
misleading climate-  
related lobbying and  
branding campaigns  
previous 3 years

**Source:** *"Big Oil's Real Agenda  
on Climate Change 2022,"* An  
InfluenceMap Report, Sept. 2022

## Well-Being Disparity and Climate is Political

There are strong connections between  
industries and politicians that are both  
stalling action on climate change and  
diminishing democracy.

**Source:** *"Global Burning: Rising Antidemocracy and the Climate Crisis,"*  
Eve Darian-Smith, Stanford University Press, April 2022

# Well-Being Disparity is Global Phenomenon

**<20%**  
of the world's  
population now  
lives in fully free  
countries

**Source:** *"Understanding the  
Global Rise of Authoritarianism,"*  
Stanford University, 2021

Many attribute the rise of global  
authoritarianism over past decades to  
exploding inequality.

**Source:** *"Global Burning: Rising Antidemocracy and the Climate Crisis,"*  
Eve Darian-Smith, Stanford University Press, April 2022

# Theory #1

If people are experiencing vastly worse health, education and earnings, it is incredibly challenging to earn their support for climate policies advocated by the government leadership and institutions that have ignored their well-being for the past 50 to 75 years.

## Theory #2

Messages inciting fear and blame are magnitudes easier to hear by those lagging in well-being than scientific findings about the risks of combusting fossil fuels.

## Theory #3

The growing demographic group suffering from low well-being can be easily attracted to vote for leadership denying climate change and promising to blow up the established rules, norms, and institutions that have badly failed them for extended periods of time.

# Conclusion

Decades of failure to ensure well-being are making it impossible to ensure persistent and coherent actions and policies critical to managing climate risks.

Thus, “well-being” trumps “climate” as the greatest existential threat to our planet,  
and can no longer be ignored in climate policies and actions.





# Smarter Climate Actions and Policies

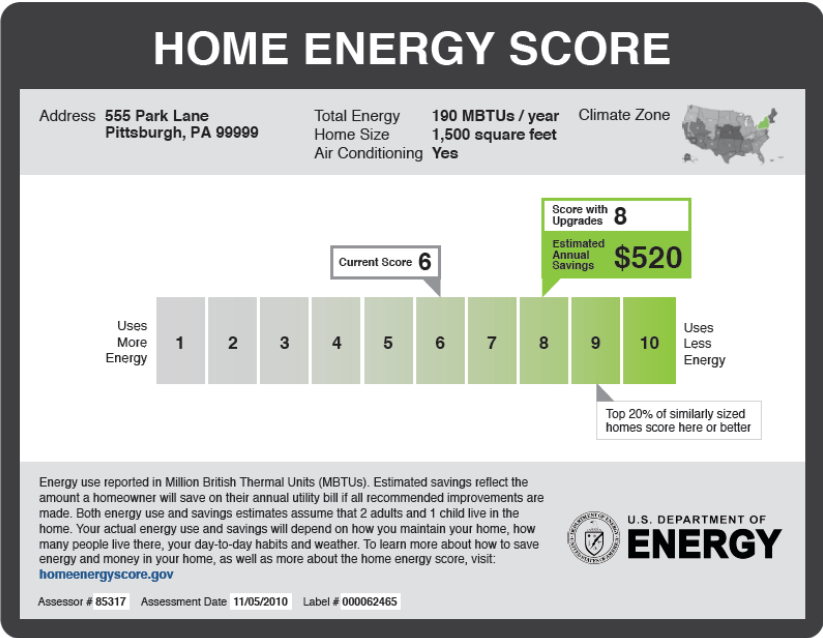
# Smarter Climate Actions and Policies

1. Use Power Messaging
2. Avoid Unforced Errors
3. Leverage Collective Impact

# Smarter: Use Power Messaging

- 1. Simple** to optimize clarity,
- 2. Short** to optimize retention,
- 3. Emotional** to optimize inspiration, and
- 4. Universal** to optimize resonance

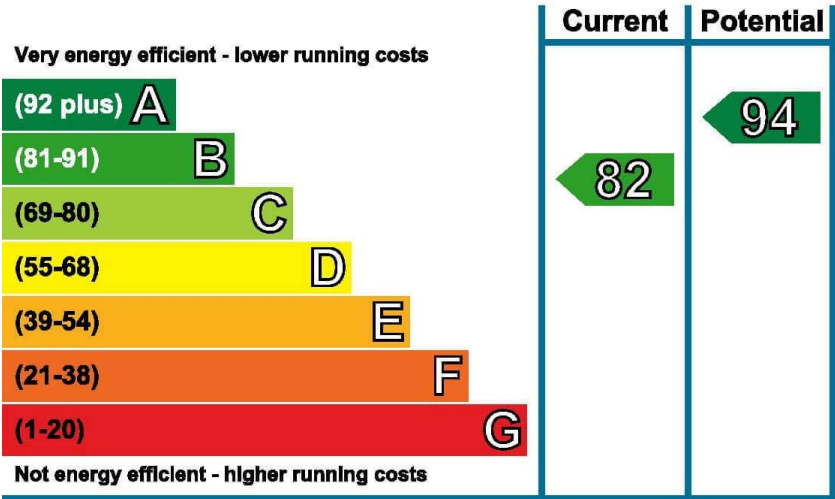
# Smarter: Use Power Messaging



VS.



## Energy Efficiency Rating

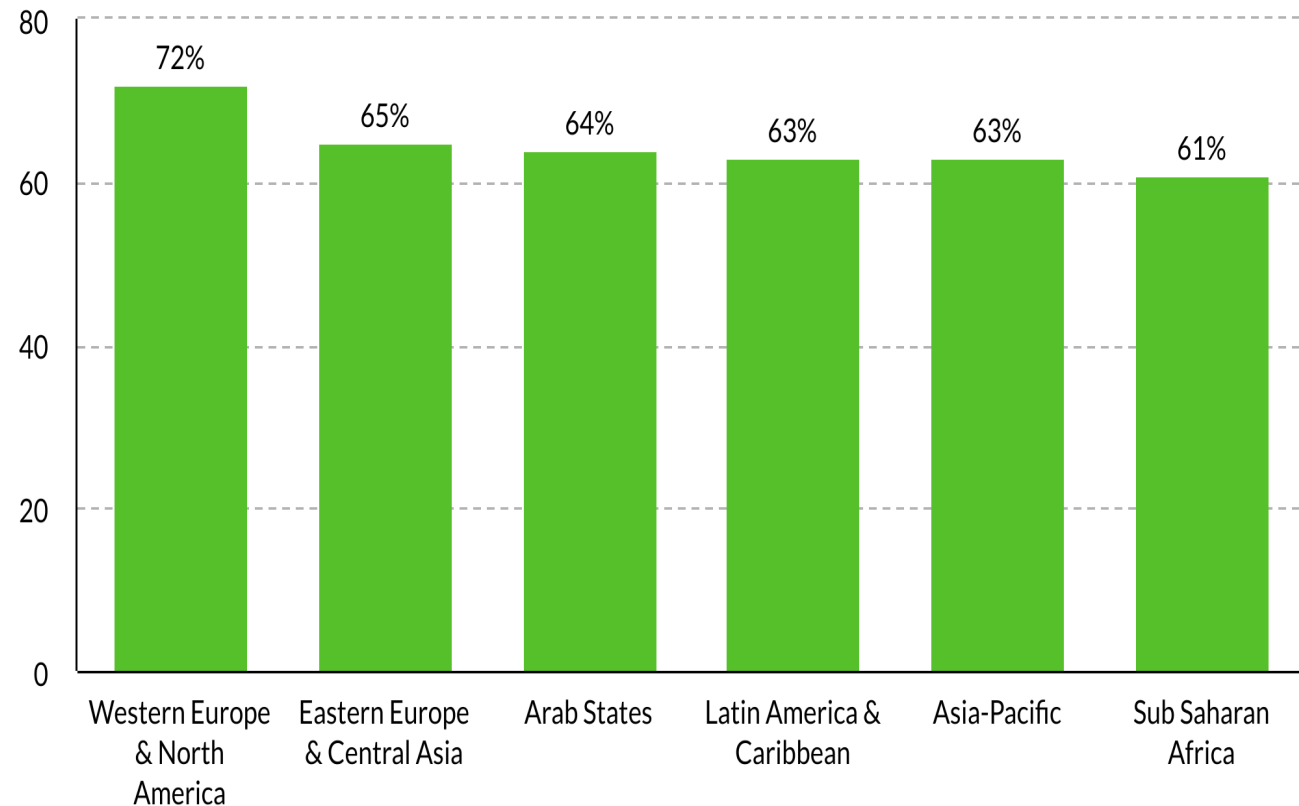


**36%**  
of people in 50  
countries do not  
believe climate  
change is a global  
emergency offended  
by climate policies  
and programs

**Source:** *“People’s Climate Vote:  
Results,” University Of Oxford,  
2021*

## Smarter: Use Power Messaging

### Public Belief in the Climate Emergency by Region



## Smarter: Use Power Messaging

# Pivot

from

*“Climate Change”*

and all its variations to

*“Well-Being”*

|           | Climate Change | Well-Being |
|-----------|----------------|------------|
| Simple    | X              | ✓          |
| Short     | ✓              | ✓          |
| Emotional | X              | ✓          |
| Universal | X              | ✓          |

## Smarter: Use Power Messaging

# Pivot

from

*“Climate Change”*

and all its variations to

*“Well-Being”*

| Climate Initiative                      | Well-Being Pivot                         |
|---|--|
| White House National Climate Task Force | White House National Wellness Task Force |
| HUD Climate Action Plan                 | HUD Affordability and Health Action Plan |
| MA Climate Ready Housing Program        | MA Assured Wellness Housing Program      |
| Climate Research Initiative             | Affordable Housing Research Initiative   |
| Climate Resilient Housing               | Affordable Resilient Housing             |

## Smarter: Avoid Unforced Errors

Leverage low-carbon cost and value advantages  
that negate the need for policies and actions  
opposed by half the country



## Smarter: Avoid Unforced Errors

### Policies and Actions Opposed by Half the Country:

- Taking Away Freedoms
- Imposing New Tax Burdens

# Smarter: Avoid Unforced Errors

## Examples of Taking Away Freedoms:

- Ban Gas Cooking
- Ban Gas Cars
- Mandate Rooftop Solar for Right to Buy a New Home

## Wellness-Based Alternative for Climate Measures:

- Use Power Messaging and Labels to Communicate Superior:
  - Cost of Ownership
  - Health
  - User Experience

# Smarter: Avoid Unforced Errors

## Examples of Imposing New Tax Burdens:

- Carbon Tax
- Efficiency and Renewable Energy Tax Subsidies

## Wellness-Based Alternative:

- Free-Market Adjustment to Optimize Affordability and Health
- Leverage Existing Tax Expenditures to Achieve Climate Goals

# \$4-\$6 Tn

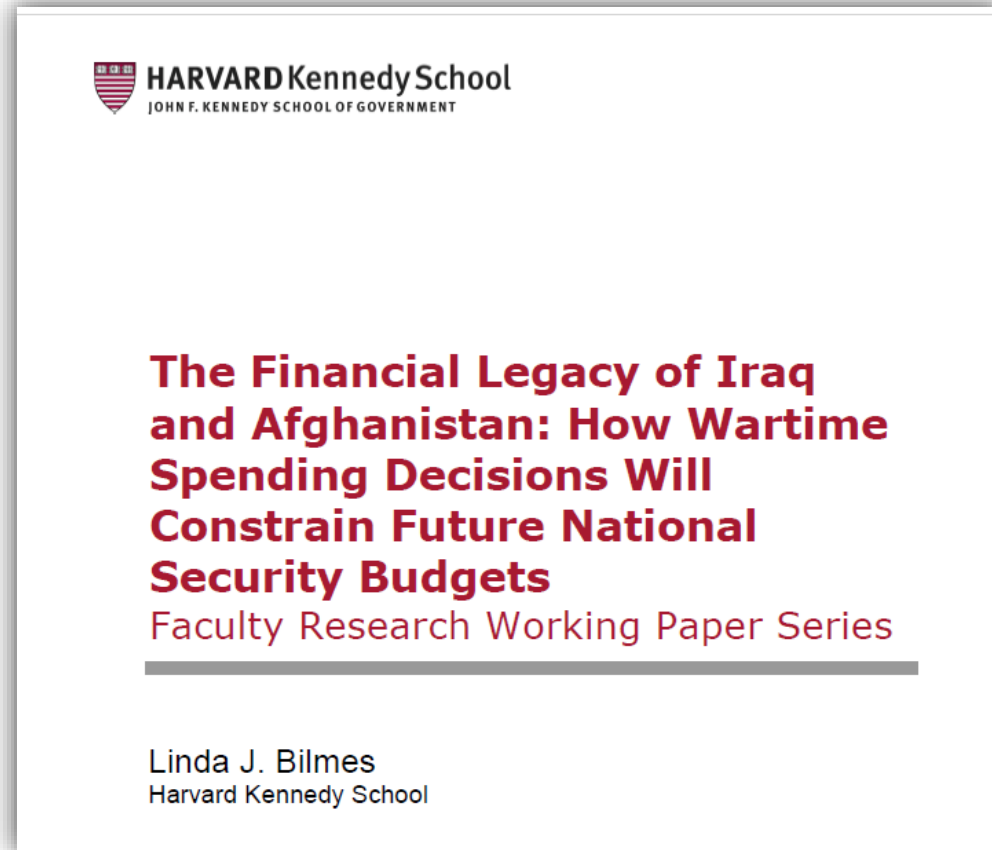
estimated final price tag of the wars in Iraq and Afghanistan with the largest piece to be paid in the future for aging veterans health care.

**Source:** “The Financial Legacy of Iraq and Afghanistan: How Wartime Spending Decisions Will Constrain Future National Security Budgets, March 2013

March 19, 2024

## Smarter: Avoid Unforced Errors

### Fossil Fuel Subsidies: Military Hidden Oil Costs



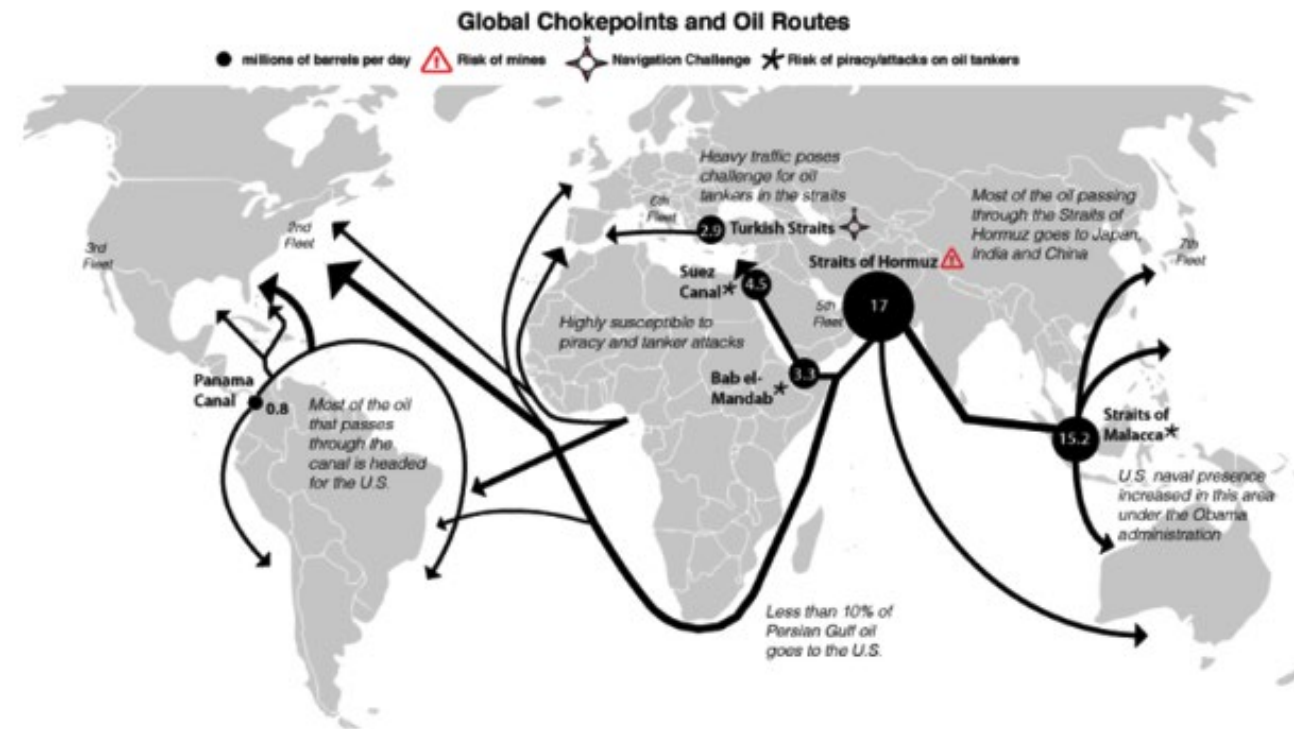
# Smarter: Avoid Unforced Errors

## Fossil Fuel Subsidies: Shipping Lane Protection

**\$8 Trillion**

spent by the U.S.  
protecting the straits of  
Hormuz.

Source: Oil Price.com, May 9,  
2013



Source: U.S. Energy Information Administration

## Smarter: Avoid Unforced Errors

### Fossil Fuel Subsidies: Coal Mine Cleanup



**\$7.5 - \$9.8 Bn**  
price tag for reclamation  
and cleanup still  
needed at mountaintop  
removal and other coal  
mines covering 633,000  
acres in seven Eastern  
states.

**Source:** *"Repairing the  
Damage, The Costs of Delaying  
Reclamation at Modern-Era  
Mines,"* Appalachian Voices  
report, July 2021



# Smarter: Avoid Unforced Errors

## Fossil Fuel Subsidies: Oil Cleanup

**\$7 Bn**

costs to clean up Exxon  
Valdez oil tanker spill.

**Source:** International Tanker  
Owners Pollution Federation  
Limited





# Smarter: Avoid Unforced Errors

## Fossil Fuel Subsidies: Oil Cleanup

**~\$62 Bn**

costs to clean up  
Deepwater Horizon gulf  
oil spill.

**Source:** USA Today, July 14,  
2016



**300+**

oil and gas pipelines  
spills per year are  
dangerous and have  
exactd a devastating  
toll on people and  
wildlife.

**Source:** Common Dreams,  
November 17, 2014

## Smarter: Avoid Unforced Errors

### Fossil Fuel Subsidies: Oil Cleanup



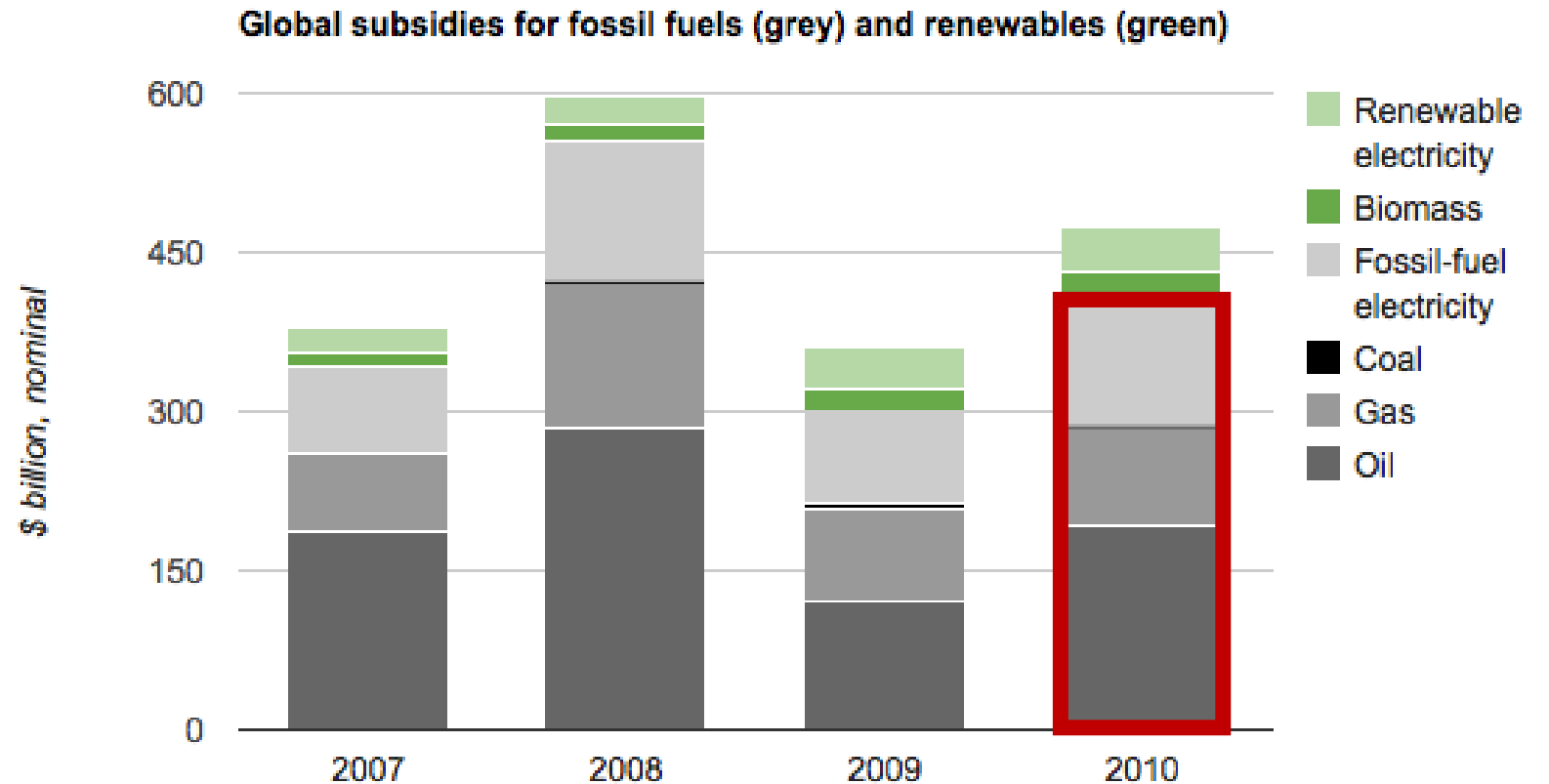
# ~\$409 Bn

spent in 2010 supporting the production and consumption of fossil fuels (e.g., expensing exploration, development, intangible drilling costs, percentage rather than cost depletion), 3/4 of which went to the oil industry.

**Source:** International Tanker Owners Pollution Federation Limited

## Smarter: Avoid Unforced Errors

### Fossil Fuel Subsidies: Taxpayer Subsidies



**~\$228 Bn**

spent by the U.S. government in 2022 for reserves that ensure energy and economic security tied to or dependence on refined petroleum and crude oil.

**Source:** "Strategic Petroleum Reserve Annual Report for Calendar Year 2022," U.S. DOE Report to Congress, October 2023

## Smarter: Avoid Unforced Errors

### Fossil Fuel Subsidies: Strategic Petroleum Reserve





# \$820 B/Yr.

health costs attributed to fossil-fuel generated air pollution and climate change, a burden falling heaviest on vulnerable communities.

**Source:** *The Costs of Inaction: The Economic Burden of Fossil Fuels and Climate Change on Health in the U.S.,* Natural Resources Defense Council, The Medical Society Consortium on Climate & Health, and Wisconsin Health Professionals for Climate Action, May 2021

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## Smarter: Avoid Unforced Errors

### Fossil Fuel Subsidies: Health Cost



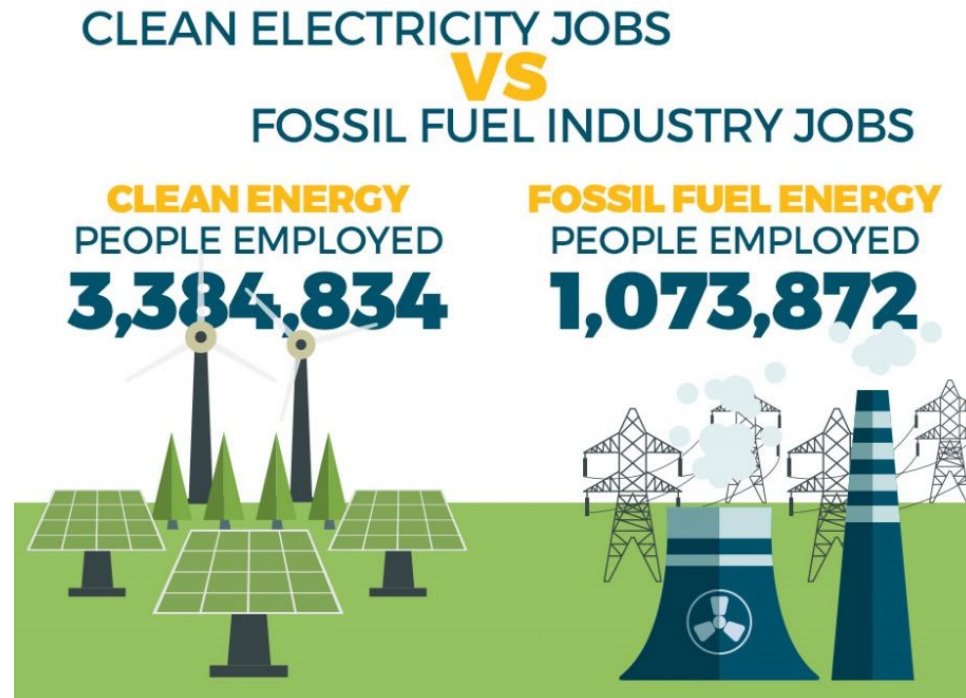
# \$2.8X

Jobs created by building efficiency than fossil fuels per \$1 million invested.

Source: *“The Green Jobs Advantage: How Climate-Friendly Investments are Better Job Creators,”* World Resources Institute, Oct. 2021

## Smarter: Avoid Unforced Errors

### Fossil Fuel Subsidies: Economic Growth



Source: *“U.S. Energy and Employment Report,”* U.S. Department of Energy, 2017

# \$5.3 Trillion

fossil fuel externality  
costs globally in 2015  
for adverse climate,  
environmental, and  
public health impacts

**Source:** *“U.S. Taxpayers Have  
Reportedly Paid an Average of  
\$8,000 Each and Over \$2 Trillion  
Total for the Iraq War Alone,”  
Paulina Cachero, Business  
Insider, Feb. 6, 2020*

## Smarter: Avoid Unforced Errors

### Free-Market Adjustments vs. Subsidies

# ~\$.20/kWh

free market wellness adjustment  
for fossil fuel generated electricity

# ~\$3/gallon

free market wellness adjustment for gasoline



## Smarter: Avoid Unforced Errors

Examples Existing Tax Expenditures that be Leveraged to Achieve Climate Goals at No/Negative Cost:

- Mortgage Interest Tax Deduction
- First-Time Home Buyer Tax Credit

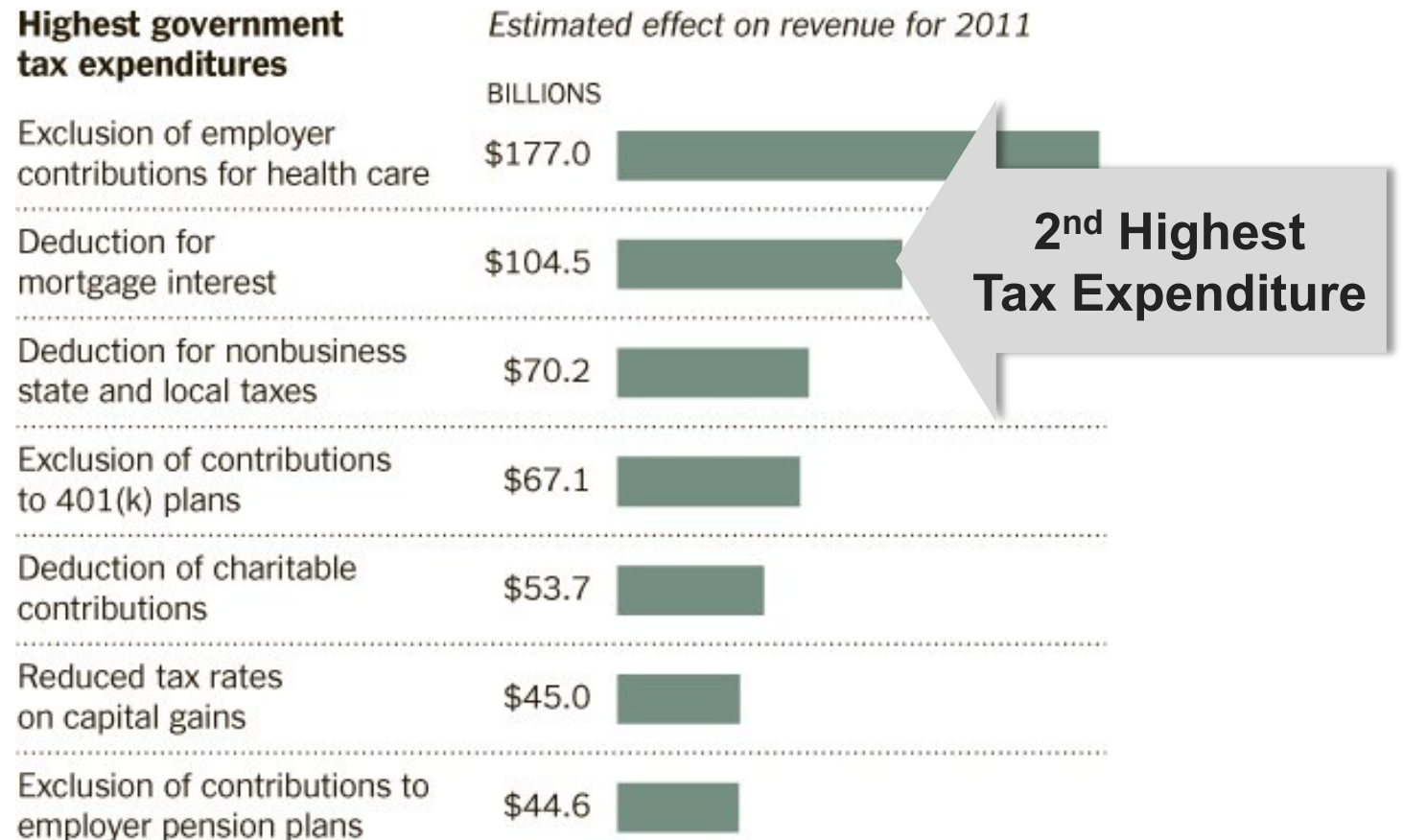
# \$1 Trillion

lost revenue for  
exemptions,  
deductions, credits and  
loopholes, known  
collectively as tax  
expenditures.

**Source:** U.S. Office of  
Management and Budget

## Smarter: Avoid Unforced Errors

### Existing Asset: Mortgage Interest Tax Deduction



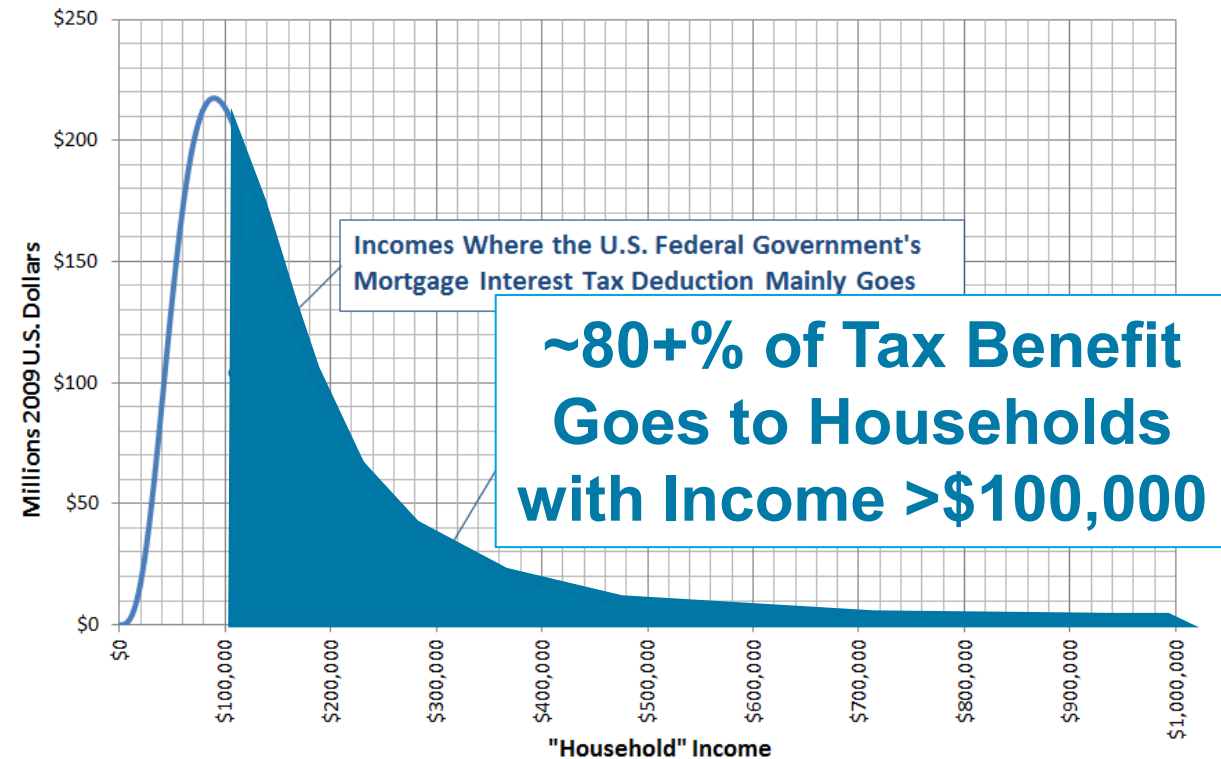
# Income Regressive

mortgage interest  
deduction tax policy.

## Smarter: Avoid Unforced Errors

### Existing Asset: Mortgage Interest Tax Deduction

Approximate Aggregate Mortgage Interest Deduction for Each \$500  
Income Increment from \$0 to \$1,000,000 in 2009



Source: Joint Committee on Taxation, JCS-3-10

© Political Calculations 2011

# Smarter: Avoid Unforced Errors

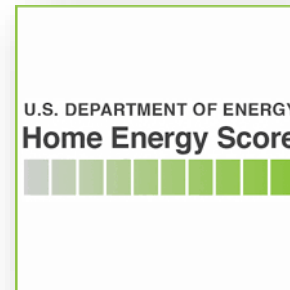
Existing Asset: Mortgage Interest Tax Deduction

**<3%**

of existing 100+ million existing homes meet current high-performance metrics.

New Homes  
40% better  
than 2009 IECC

Home retrofits  
that reduce  
energy use  
15% - 30+%



## Well-Being:

- Financial
- Healthy Homes
- Healthy Air
- Energy Security

=

**<3%**

of existing 100+ million  
existing homes meet  
current high-  
performance metrics.

## Smarter: Avoid Unforced Errors

### Solution: Retool Mortgage Interest Deduction

Instead of complete elimination, change  
Treasury Department policy requirements:

- New homes must be Certified to 'DOE Zero Energy Ready Home', or
- Existing homes must achieve minimum DOE Home Energy Score of 7.5 'as is' or with an upgrade within a year financed with EIM.
- Resources set aside for low-income housing

## Smarter: Avoid Unforced Errors

### Retooled Mortgage Deduction Benefits:

- **~\$350 Billion – \$1+ Trillion** Utility Bill Savings
- **~\$90 – \$270 Billion** Annual Construction Revenue
- **~\$1.5 - \$4.5 Trillion** Additional Tax Revenue
- **~120,000 – 360,000** Persistent New Jobs
- **~3 - 9 Million** Job-Years of Work
- **~670 – 2,000+ Trillion BTU** Energy Savings/Yr.
- **~2,800 – 8,400 MMTCe** Reduce Carbon Emissions

# 10 Years

transform the  
substandard existing  
housing stock.

# Results:

- Elizabeth River cleanup in southeastern VA
- Strive student success programs in Cincinnati and Northern KY
- Shapeup in Summerville, MA childhood obesity

**Source:** *“Collective Impact,”*  
John Kania and Mark Bremer,  
Stanford Social Innovation  
Review, Winter, 2011

## Smarter: Leverage Collective Impact

### Five Conditions:

- Common Agenda
- Shared Measurement Systems
- Mutually Reinforcing Activities
- Continuous Communication
- Backbone Support Organizations



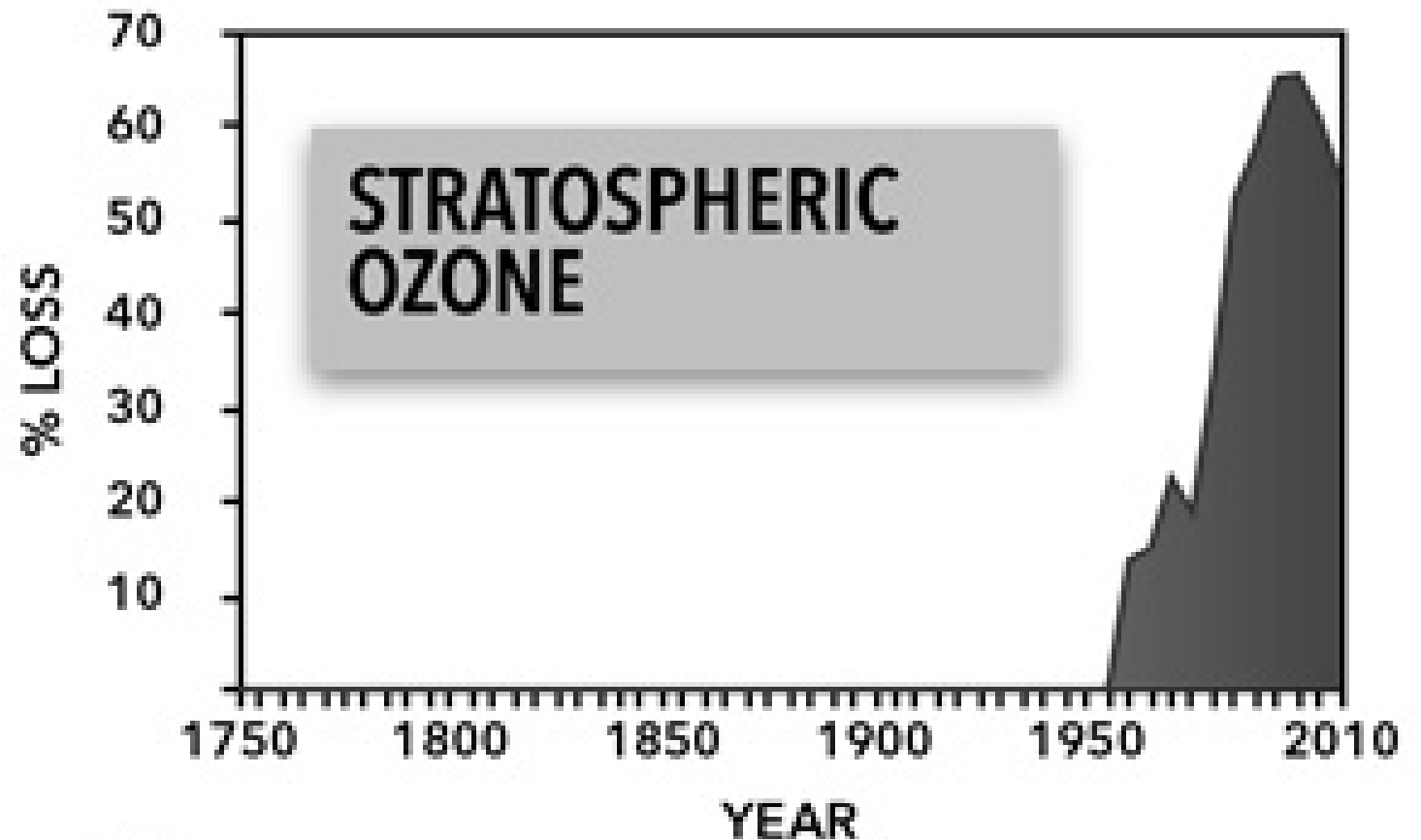
# Only 1

Earth system trend indicates a curve that may be the result intentional human intervention – the success story of ozone depletion.

**Source:** W. Steffen, W. Broadgate, L. Deutsch, O. Gaffney and C. Ludwig (2015), The Trajectory of the Anthropocene: the Great Acceleration, The Anthropocene Review.

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Good News: We Can Make a Difference





An aerial photograph of New York City, showing the dense urban landscape of Manhattan and the surrounding areas. The Hudson River is visible on the left, and the East River is on the right. The city is filled with numerous skyscrapers and buildings, with the water providing a stark contrast to the urban sprawl.

***“The earth is not inherited from our fathers  
but borrowed from our children.”***

Native Proverb

***“Who we are is what we leave behind.”***

Subaru ‘Stop Waste’ Campaign