



Yale College
Class of 1971

“Climate Change: Realities, Risks, Opportunities”

Yale College Class of 1971 Virtual Reunion

Sunday, May 9, 2021 | 4:00 pm ET

Moderator: Frances Beinecke, MS, LL.D (Hon) (ES) — career environmental activist; former President National Resources Defense Council; Member, Advisory Board MIT Energy Initiative; former service as Fellow, Yale Corporation, Co-chair, Leadership Council, Yale School of the Environment

Panelists – *slides herein are in the order presented*

John Aber, PhD (BK) — University Professor of Environmental Sciences, former VP of Research and Provost, University of New Hampshire; recipient of Yale’s Wilbur Cross Medal for achievements in scholarship, teaching, and service, author of *Terrestrial Ecosystems* and *The Sustainable Learning Community*

Anthony Leiserowitz, PhD, Senior Research Scientist, Yale School of the Environment; Director, Yale Program on Climate Change Communication (YPCCC)

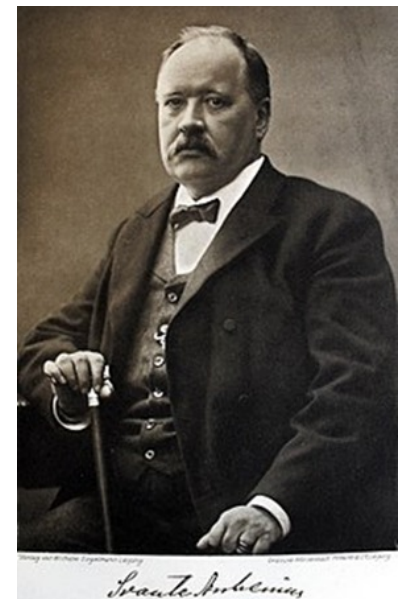
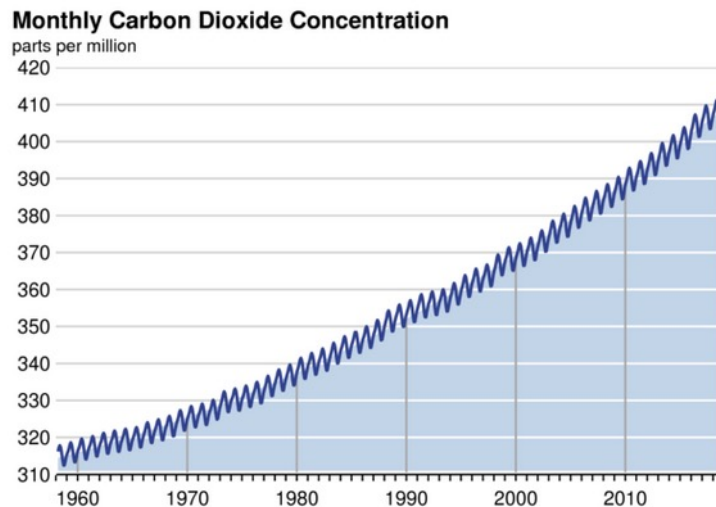
Walt Mintkeski, MS (PC) — Environmental Engineer, energy efficiency consultant; volunteer citizen activist for The Sierra Club, Oregon League of Conservation Voters, Johnson Creek Watershed Council, The Nature Conservancy in Oregon, and Citizens Climate Lobby; Lifetime Conservation Achievement Award from The Nature Conservancy (2011).

Merideth Wright, JD (BR) — Founding judge of Vermont Environmental Court (1990-2011), former environmental lawyer; writer, speaker, and international consultant on environmental and judicial topics associated with the Environmental Law Institute as Distinguished Judicial Scholar

Climate Science in 5 Easy Questions

Bottom Line: The Science Is Not Controversial Among Scientists

- In what year did we discover that CO₂ absorbed infrared or heat radiation and so could be a greenhouse gas?
- In what year did the first Nobel-laureate scientist calculate how much a doubling of CO₂ in the atmosphere would increase global temperatures?
- How much have CO₂ and temperature increased?
- Is there a relationship between temperature and CO₂?
- How does our future look?



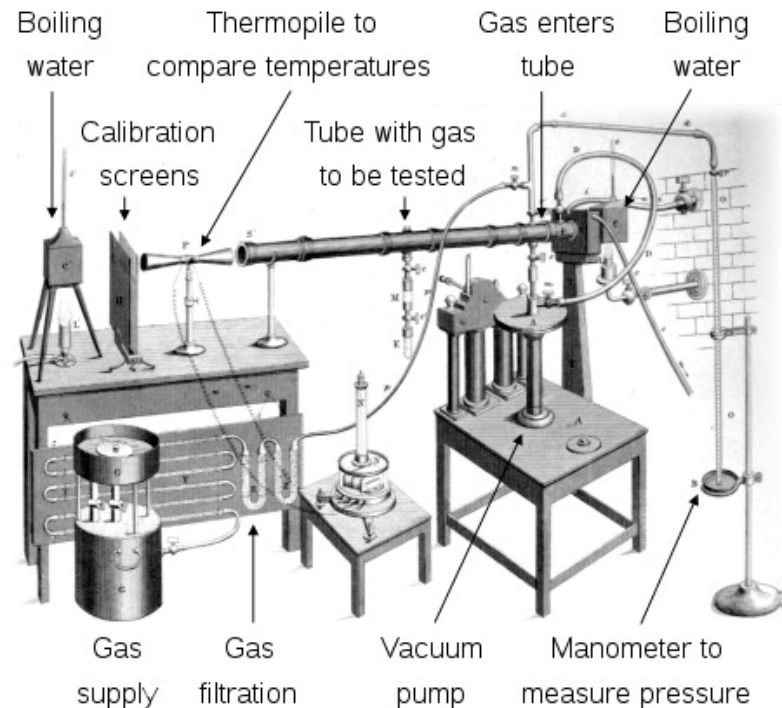
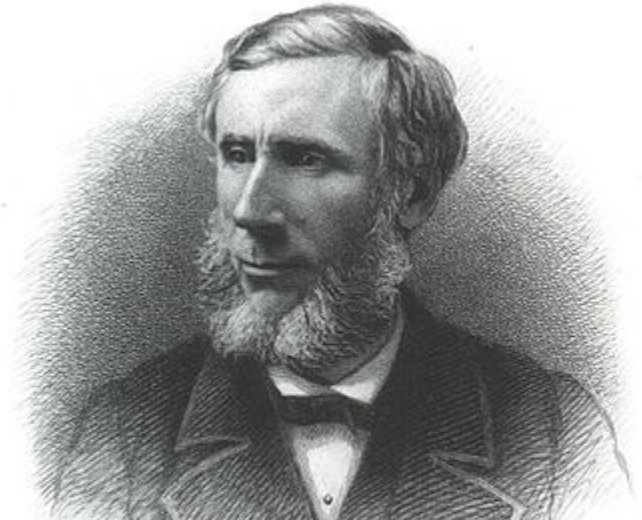
In what year did we discover that CO₂ absorbed infrared or heat radiation and so could be a greenhouse gas?

1859

John Tyndall invents method for measuring the absorbance of infrared radiation by different gases

CO₂, methane, water vapor

Speculates that Earth would be very cold without them!



In what year did the first Nobel-laureate scientist calculate how much a doubling of CO₂ in the atmosphere would increase global temperatures

1896

Svante Arrhenius spends a full year doing hand calculations using Tyndall's findings

Predicts a doubling of CO₂ would cause a global increase of 4°C with a simple “model”

$$\Delta F = \alpha \ln(C/C_0)$$

Actual value: 3.1°C

Other estimates: 2-4°C



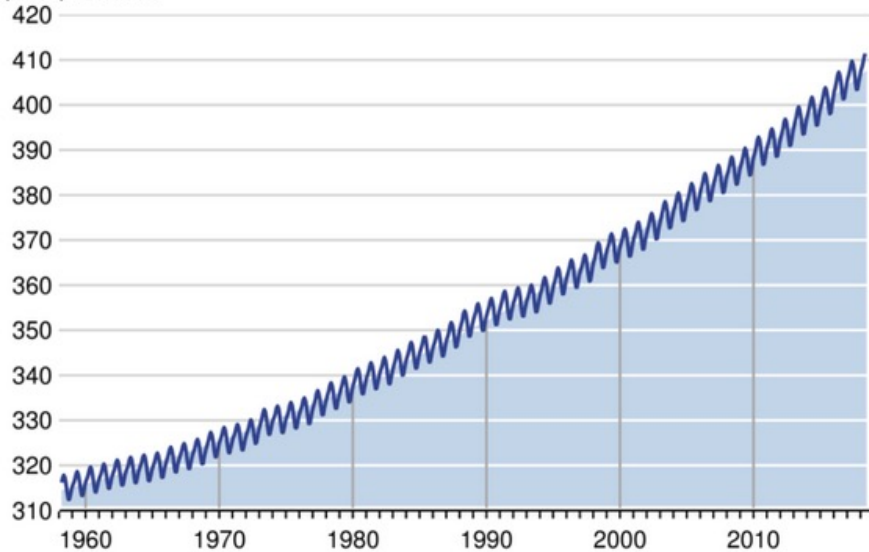
How much have CO₂ and temperature increased?

The Keeling Curve

CO₂ Concentration at Mauna Loa Observatory, Hawaii

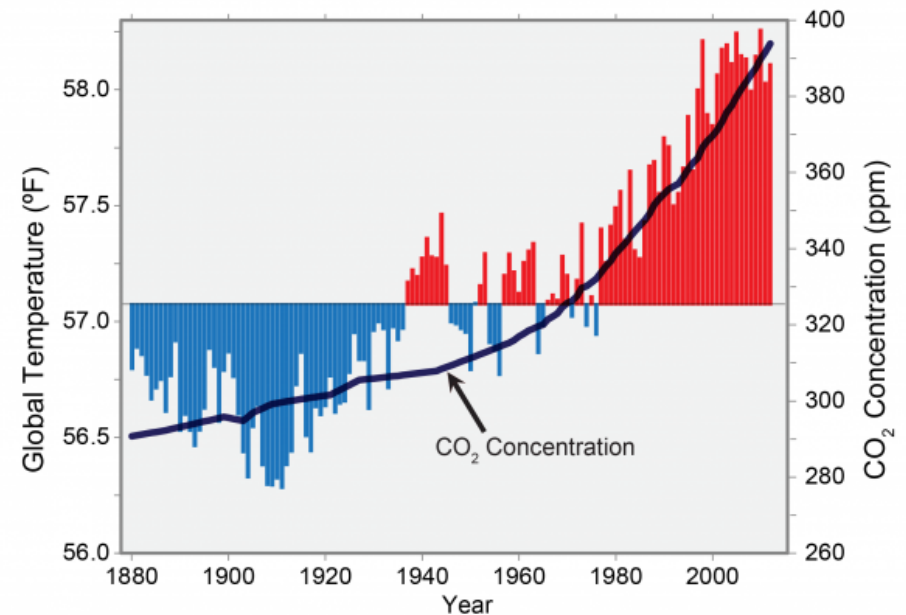
Monthly Carbon Dioxide Concentration

parts per million

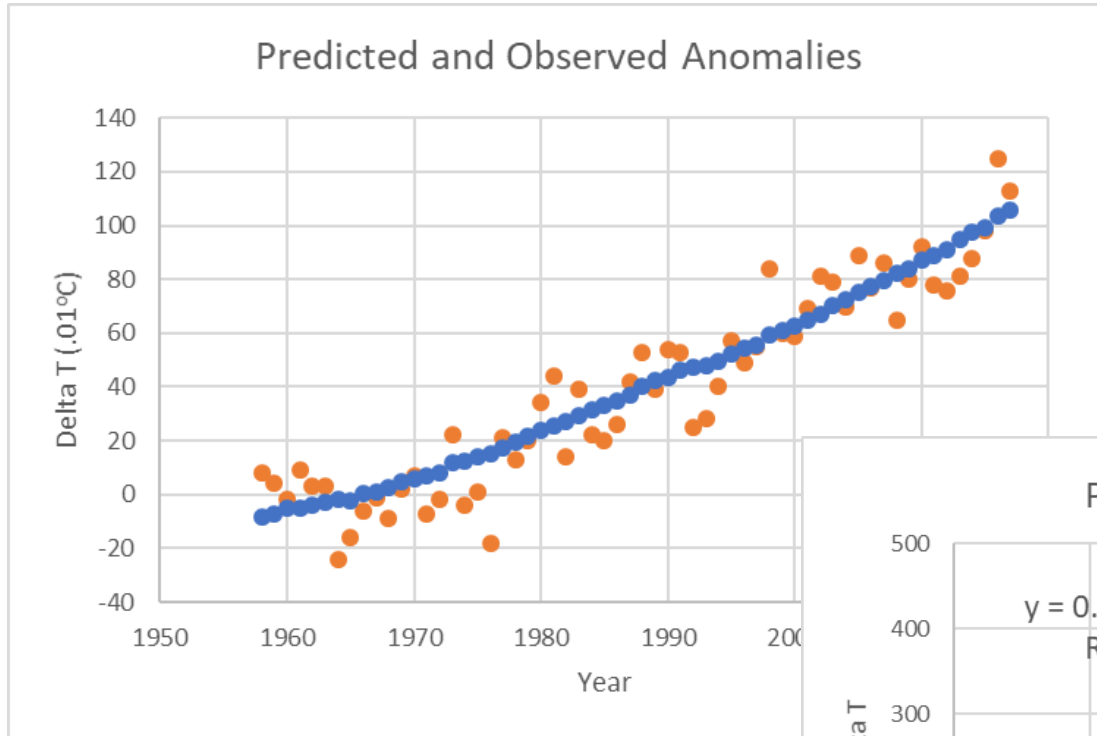


CO₂ never higher than 300 ppm over last 800,000 years

Global Temperature and Carbon Dioxide



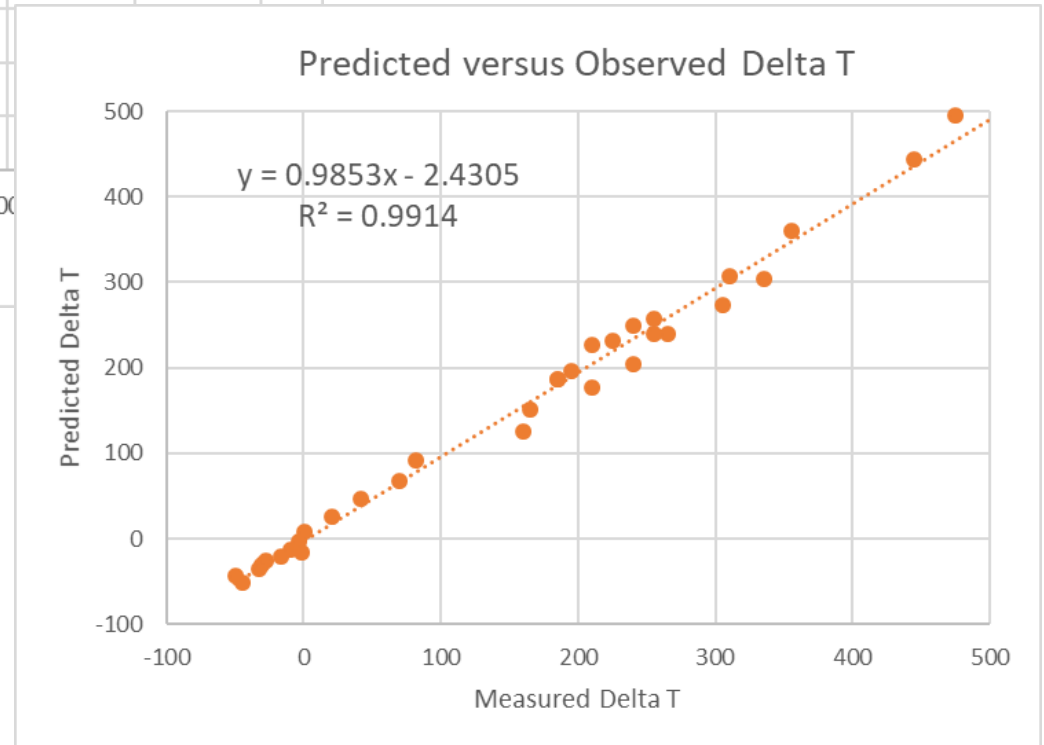
Is there a relationship with measured temperatures?



Arrhenius “alpha” = 4.50
Prediction error less than .1 C

An additional El Nino Signal

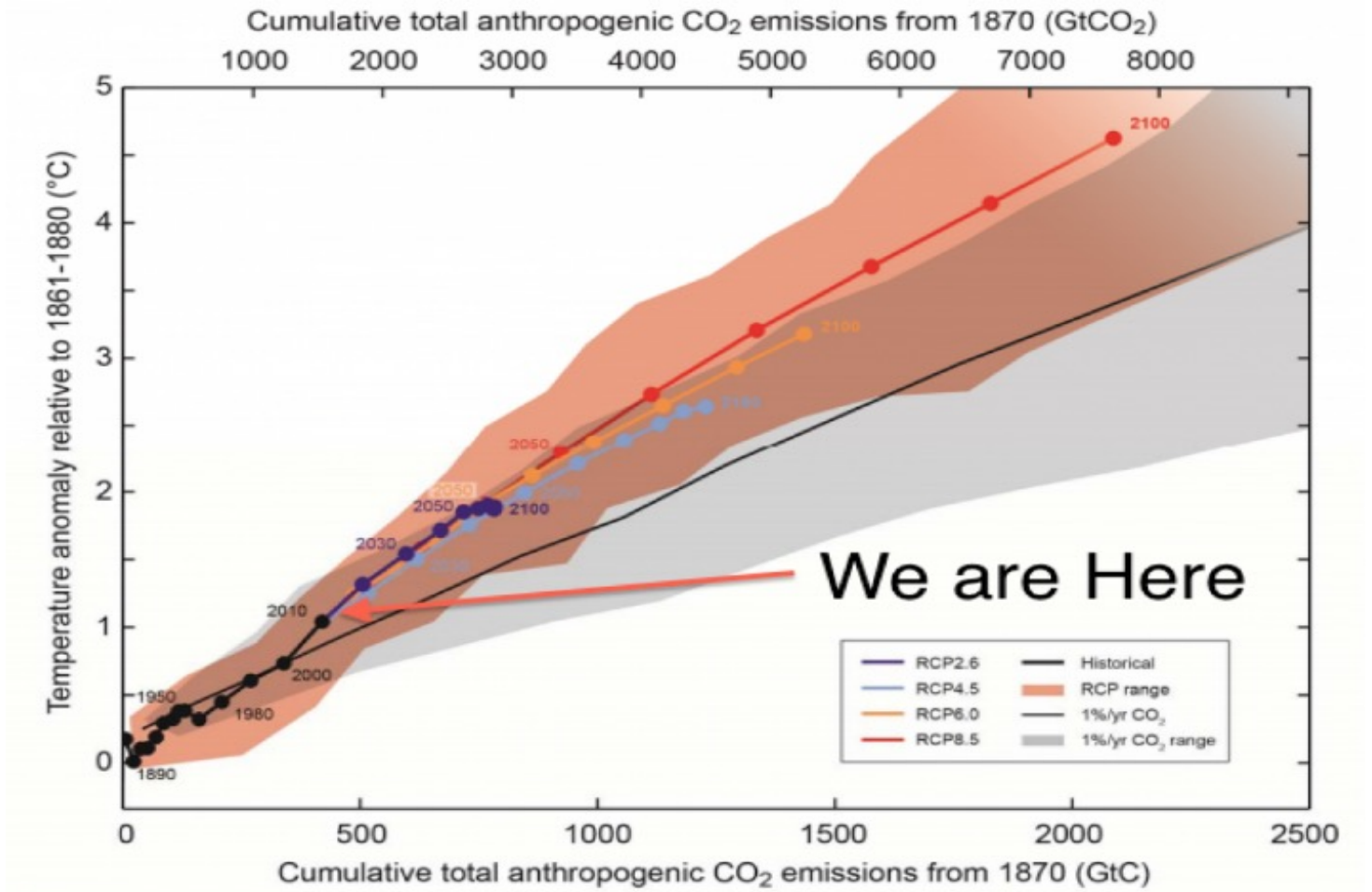
Even predicts modeled futures



How does our future look?

It depends on what we decide to do about it!

Bottom Line: The science is not controversial within the science community



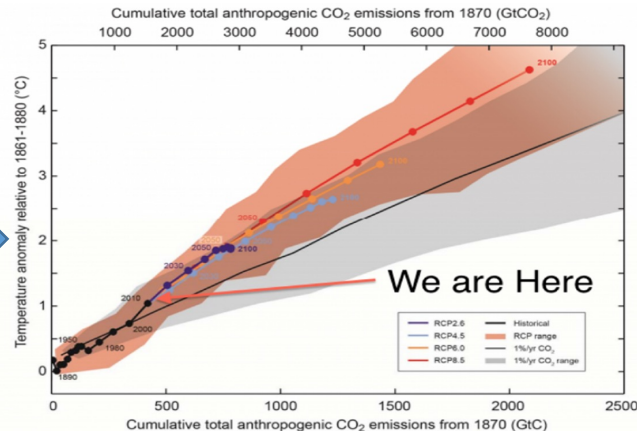
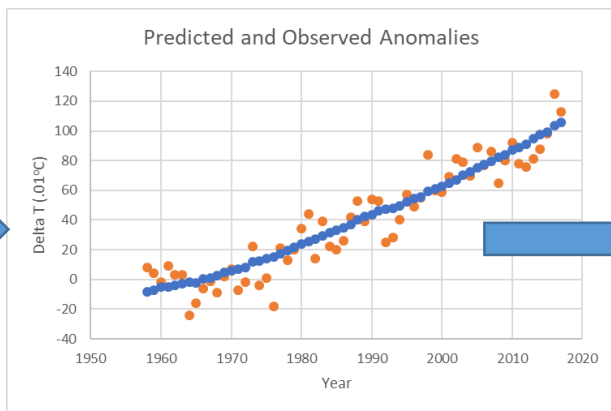
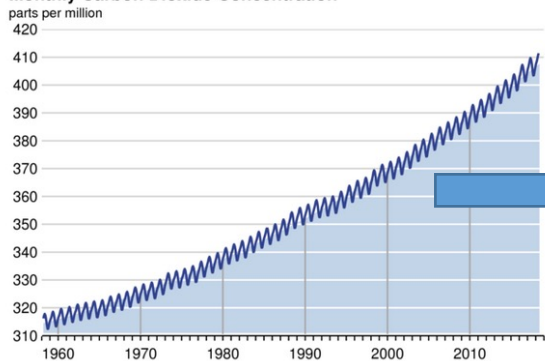
- IPCC 2014

Climate Science in 5 Easy Questions

Bottom Line: The Science Is Not Controversial Among Scientists

- In what year did we discover that CO₂ absorbed infrared or heat radiation and so could be a greenhouse gas? **1859**
- In what year did the first Nobel-laureate scientist calculate how much a doubling of CO₂ in the atmosphere would increase global temperatures? **1896**
- How much have CO₂ and temperature increased? **A Lot**
- Is there a relationship between temperature and CO₂? **Yes!**
- How does our future look? **It Depends**

Monthly Carbon Dioxide Concentration



Climate Change: Realities, Risks, and Opportunities

Walt Mintkeski

Opportunities to move away from fossil fuel-based economy toward a more just, sustainable, healthier society and planet

Results of Fossil Fuel Dependence:

- Global warming
- Adverse health impacts
- Unjust siting of fuel extraction and refining facilities

Change Depends on Creating Political Will

- National: Citizens' Climate Lobby
- State and Local
- Youth: Sunrise Movement
- Become involved
- No silver bullet; just silver buckshot

Citizens' Climate Lobby: Creating Political Will

- National Carbon Fee and Dividend Concept
- HR 2307: Energy Innovation and Carbon Dividend Act
- CO₂ Regulation vs. CO₂ pricing

CO₂ Regulation

- Designate only certain sectors of economy
- Slow implementation process
- Challenges from the regulated
- Example: Vehicle Emission & Efficiency Standards

CO₂ Pricing

- Economists agree: pricing carbon fuels more efficient than regulation
- Covers all economic sectors
- Provides price signal which business understands and prefers
- Fosters innovation

Energy Innovation & Carbon Dividend Act:

HR 2307 introduced by Ted Deutch, Florida, 3/31/21

- Gradually increasing price: \$10/year/ton equivalent CO₂ emissions.
- Fees returned as monthly dividend
- Fee is environmentally just: fast reduction in emissions
- Dividend is economically just: 90% of low-income people made whole
- Everyone becomes a constituent
- Regulation and other measures still needed

Support for Carbon Fee and Dividend Concept:

- Climate Leadership Council founded June 2017
- ECONOMISTS' STATEMENT ON CARBON DIVIDENDS in Wall Street Journal Jan 17, 2019:
3589 U.S. Economists
- HR 2307 has 40 cosponsors as of 4/28/21

Websites for further information:

- Citizens' Climate Lobby

<https://citizensclimatelobby.org/>

- Climate Leadership Council <https://clcouncil.org/our-plan/>

- ECONOMISTS' STATEMENT ON CARBON DIVIDENDS

<https://clcouncil.org/economists-statement/>

- H.R. 2307: The Bipartisan Climate Change Solution

<https://citizensclimatelobby.org/energy-innovation-and-carbon-dividend-act/> and

<https://energyinnovationact.org/>

Climate Change in the American Mind

Anthony Leiserowitz, PhD
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Global Warming's "Six Americas"

Alarmed

Concerned

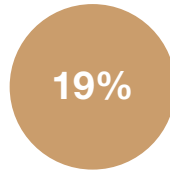
Cautious

Disengaged

Doubtful

Dismissive

December 2020
n = 1,036



Highest Belief in Global Warming
Most Concerned
Most Motivated

Lowest Belief in Global Warming
Least Concerned
Least Motivated



Alarmed



Concerned



Cautious



Disengaged



Doubtful



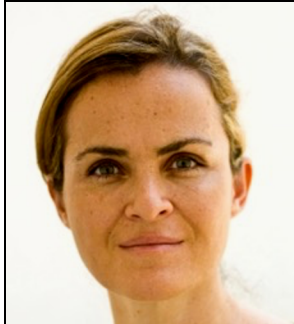
Dismissive

“If you could ask an expert on global warming one question, which question would you ask?”

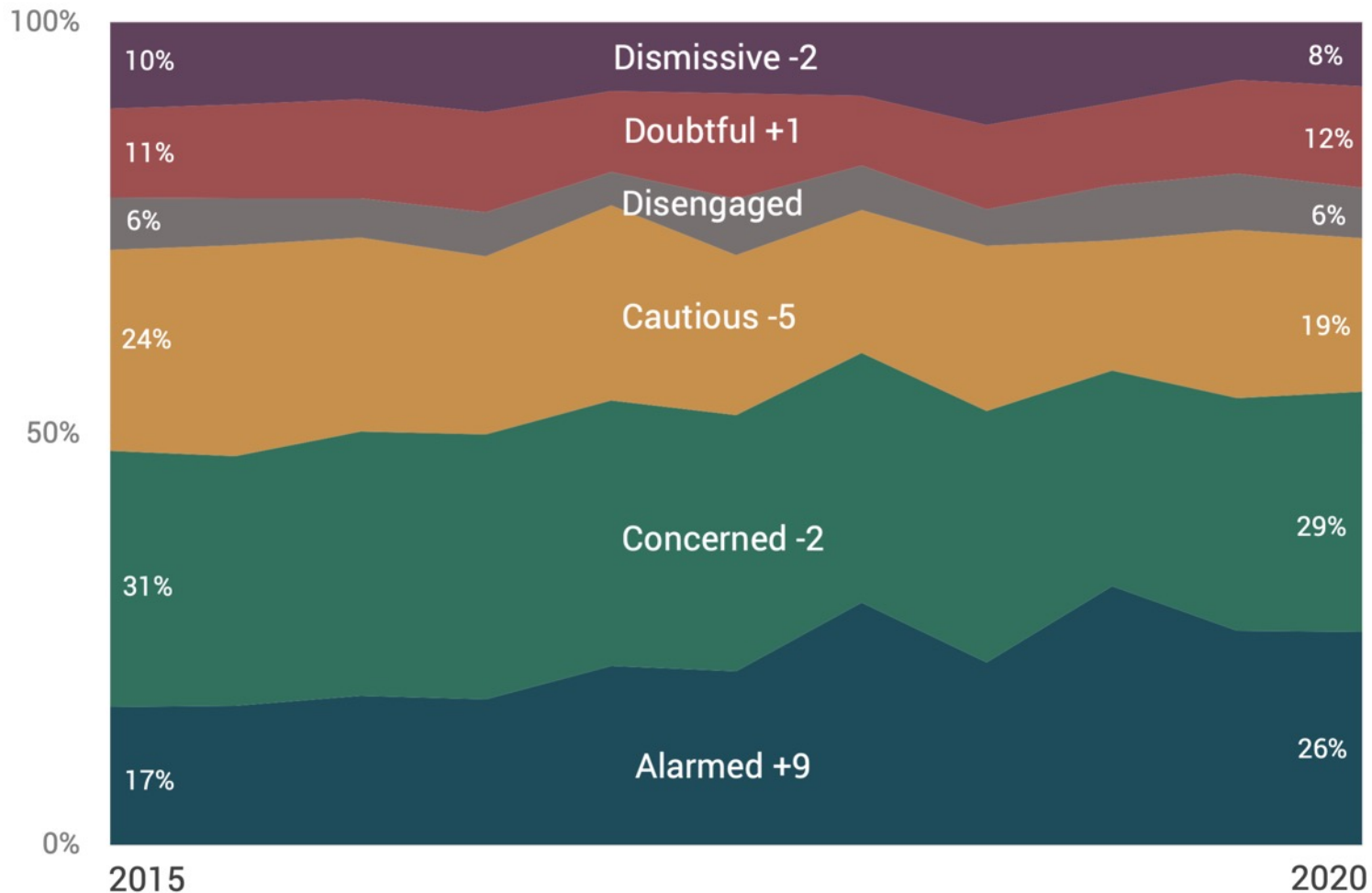
What can the world (and I) do to reduce global warming?

How do you know that global warming is happening or human-caused?

What harm will it cause? Why should I care?



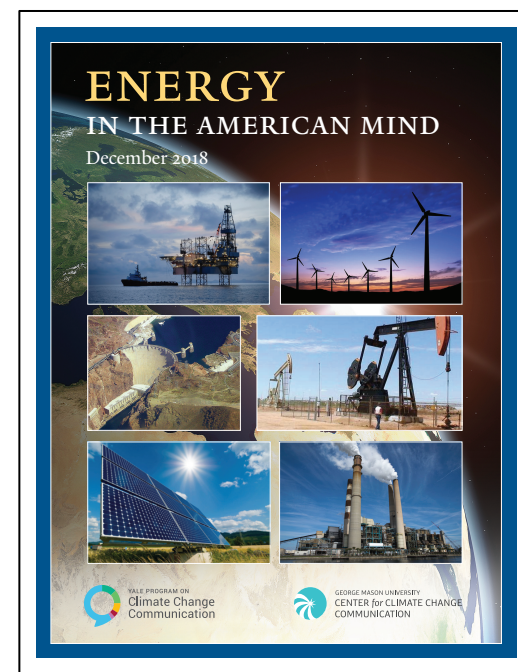
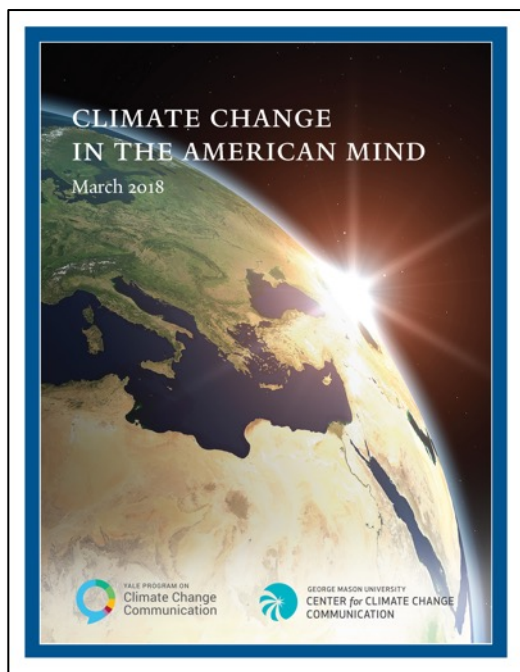
Global Warming's Six Americas 5 Year Change (2015-2020)



Data from 11 waves of the *Climate Change in the American Mind* national survey.

October 2015 – December 2020. (n = 13,381).





Sign up for updates at:

climatecommunication.yale.edu