 NATIONAL ECONOMIC EDUCATION DELEGATION

Climate Change Economics


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Rotary Club of San Francisco
June, 2022

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National Economic Education Delegation

- **Vision**
 - One day, the public discussion of policy issues will be grounded in an accurate perception of the underlying economic principles and data.
- **Mission**
 - NEED unites the skills and knowledge of a vast network of professional economists to promote understanding of the economics of policy issues in the United States.
- **NEED Presentations**
 - Are **nonpartisan** and intended to reflect the consensus of the economics profession.

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Who Are We?

- **Honorary Board: 54 members**

- 2 Fed Chairs: Janet Yellen, Ben Bernanke
- 6 Chairs Council of Economic Advisers
 - o Furman (D), Rosen (R), Bernanke (R), Yellen (D), Tyson (D), Goolsbee (D)
- 3 Nobel Prize Winners
 - o Akerlof, Smith, Maskin

- **Delegates: 590+ members**

- At all levels of academia and some in government service
- All have a Ph.D. in economics
- Crowdsource slide decks
- Give presentations

- **Global Partners: 45 Ph.D. Economists**

- Aid in slide deck development

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Credits and Disclaimer

- **This slide deck was authored by:**

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- **Disclaimer**

- NEED presentations are designed to be nonpartisan.
- It is, however, inevitable that the presenter will be asked for and will provide their own views.
- Such views are those of the presenter and not necessarily those of the National Economic Education Delegation (NEED).

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How Can Economists Contribute to Thinking about Climate Change?

- By assessing behavioral reactions to climate change.
- By measuring the damage and estimating the economic costs of fighting climate change.
- By designing smart policies that minimize costs.
 - Balance economic growth with GHG emission mitigation.

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Climate Change Science

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How Much Pollution Does Society Want?

Analogy: How Many Oranges Does Society Want?

- People grow and sell oranges for a price that at least covers costs (*supply*).
- People will not pay more for them than what they consider to be their value (*demand*).
- Prices let *supply* and *demand* balance out. The price settles where:

of oranges people want to sell = # of oranges people want to buy

- This is the “right” number of oranges for society.
- Prices reflect scarcity and the social value of the resource.



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Electricity Is Different From Oranges

- Many sources of electricity generate pollution.
- **Pollution is an EXTERNALITY:**
 - a side effect (cost or benefit) that affects someone else when something is bought or sold.
 - This is a *market failure*.
- **The price of electricity does not reflect all of the costs.**
 - Electricity is too cheap.
 - There is too much pollution.



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Impacts of Climate Change



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How These Impacts Affect Humans

- Agriculture
- Fisheries
- Coastal damages
- Direct health effects, including sickness and death (temperature & drought; also pollution)
- Indirect health effects (vector-borne disease)
- Reduced fresh water availability
- Wildfires
- Shifting zones for important ecosystems, and desertification
- Reduced worker productivity
- Increased violence
- Some of these may cause human migration and/or conflict



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Social Cost of Carbon

- **Cost above price paid.**
- **The expected cost of damages from each unit of greenhouse gas emissions.**
- **Current EPA estimate: ~\$51 per metric ton of CO₂.**
 - About \$32 Billion for all vehicles in the US.
- **Social cost of carbon will increase over time.**



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Economics of Responding to Climate Change

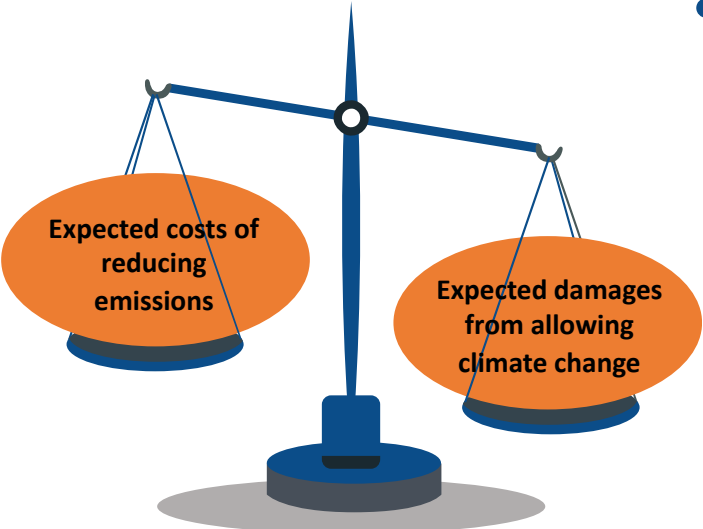


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How Economists Decide How Much to Fight Climate Change

- Cost Benefit Analysis
- Weigh:



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Cost-Benefit Analysis of Fighting Climate Change

- Most economic models suggest the costs of keeping warming below 2°C are relatively small.
 - Costs amount to **1-4% of GDP by 2030.**
- Costs of acting to keep warming below 2°C are almost certainly less than future economic damages they would avoid.
 - Damages estimated to be between: **7 - 20% of worldwide GDP.**
- Caveats:
 - Putting a monetary value on priceless things
 - Inequality
 - Uncertainty and risk

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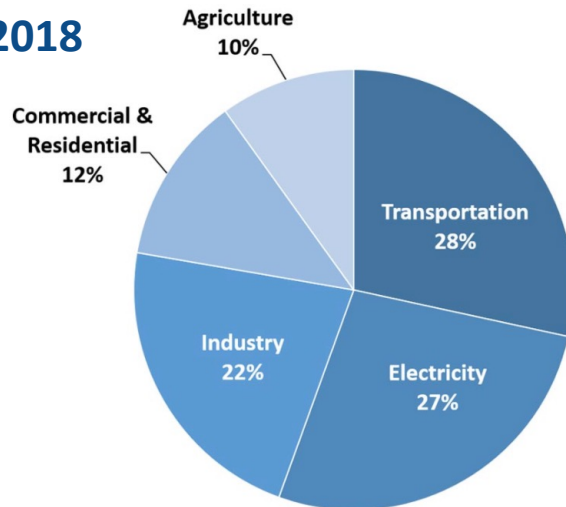
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Addressing the Sources of Our Emissions



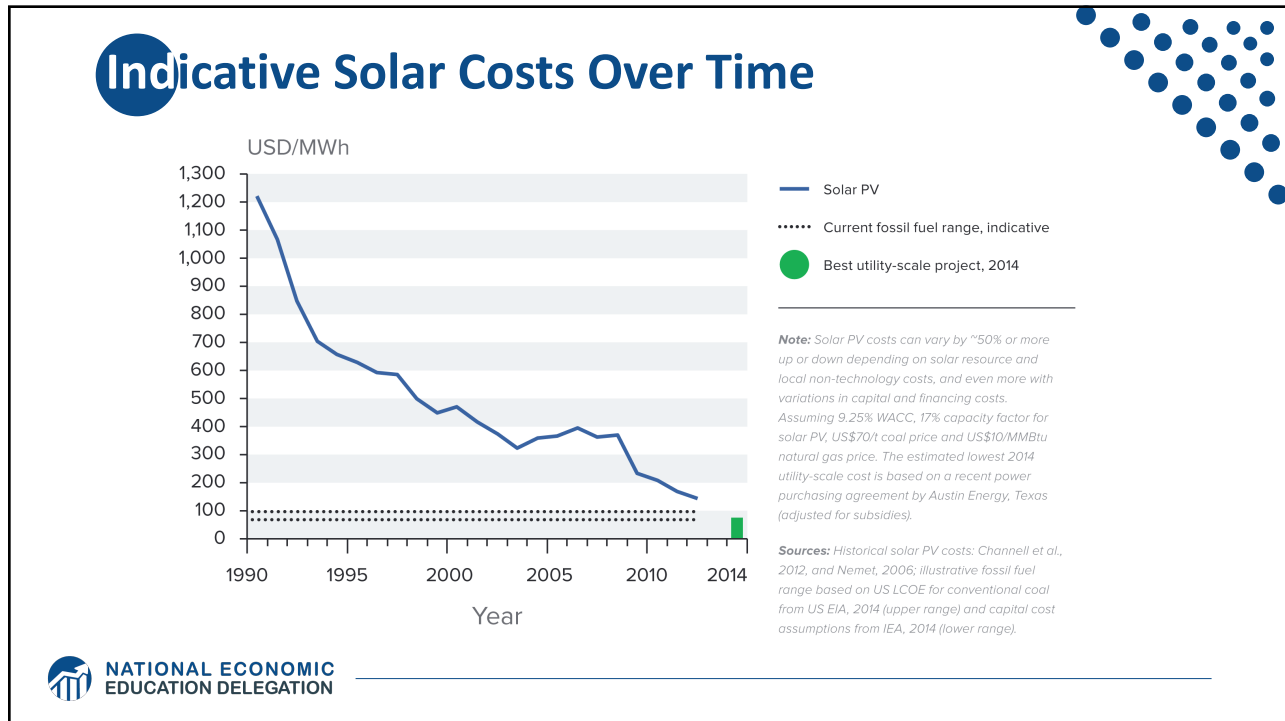
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Total U.S. Greenhouse Gas Emissions by Economic Sector in 2018

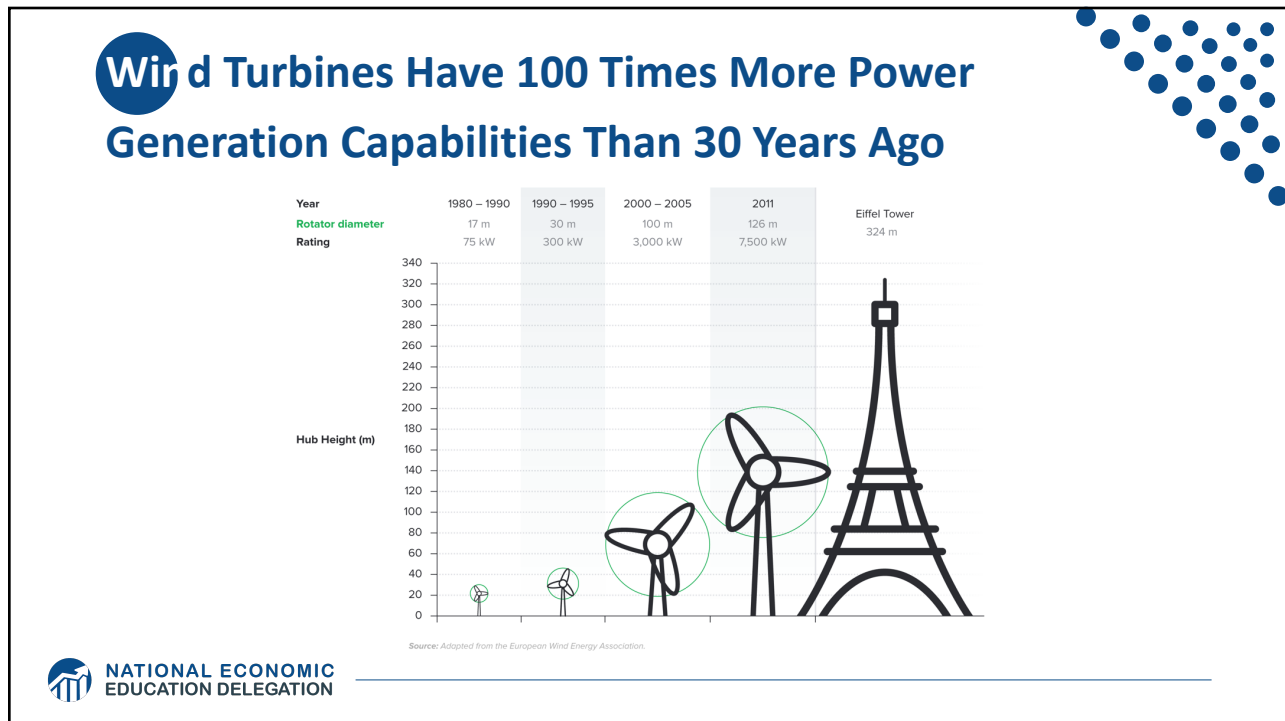


U.S. Environmental Protection Agency (2020). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2018

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Climate Change Policy



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Policies That Reduce Emissions: Directly

- **Regulation**

- Emissions standards or limits
 - E.g., CAFE standards

- **Market-oriented policies**

- Putting a price on emissions
 - Subsidizing green energy (*e.g.*, feed-in tariffs)
 - Tax or cap & trade



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Policies That Reduce Emissions: INDirectly

- **Subsidizing R&D**
- **Grid / infrastructure**
- **Energy efficiency mandates and subsidies**
- **Mandating renewable energy (*e.g.*, renewable portfolio standards)**
- **Land use policies**



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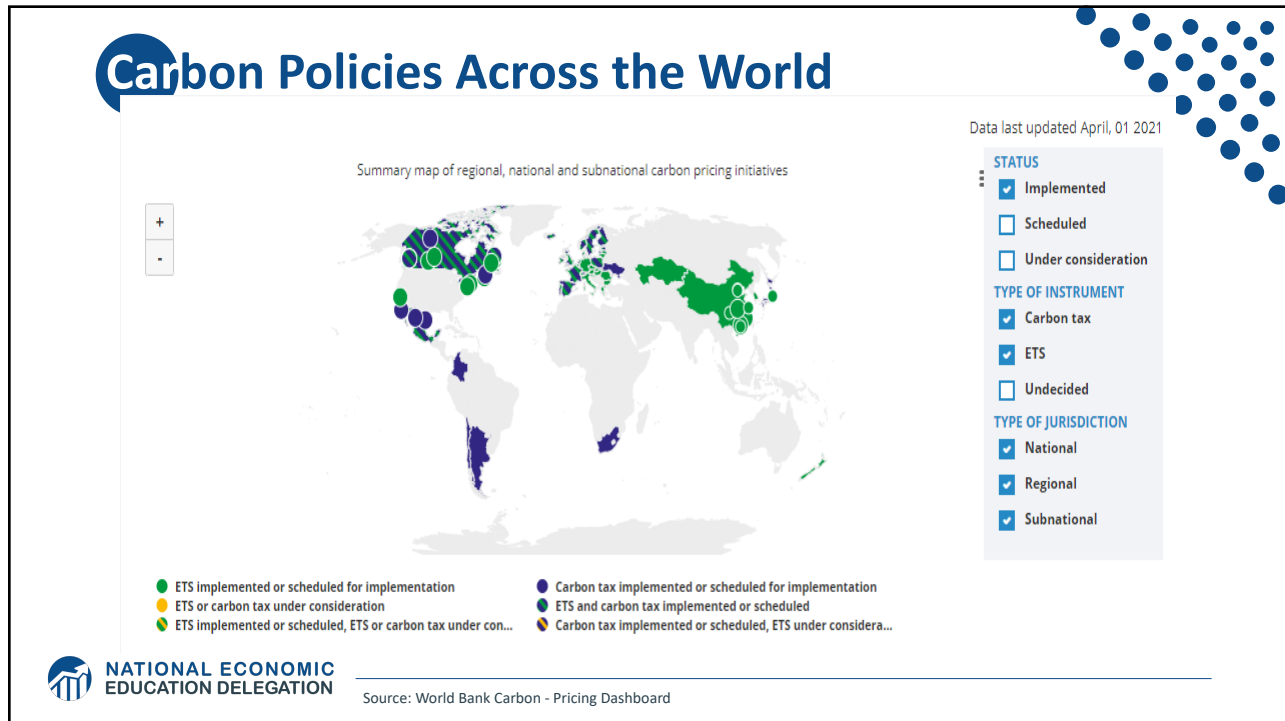
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Climate Change Policy in Action

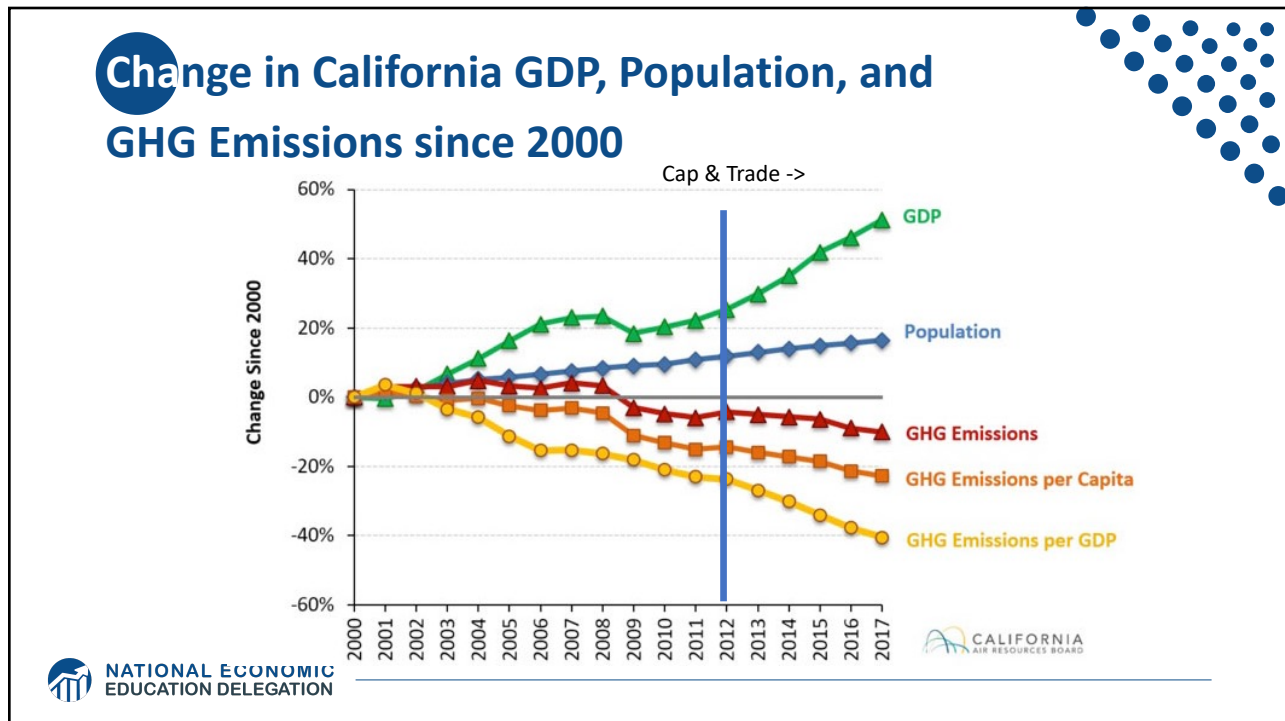


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Summary

- Climate change is real, is caused by human actions, and has impacts we're already feeling.
- We need to reduce emissions to balance the costs of action against the costs of inaction.
- Scientists and the IPCC recommend that we work to keep warming below 1.5 degrees celcius.

- *Economists believe that this goal is well worth the costs!*



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Summary – *continued*

- There are many ways to reduce emissions.
- Economics-inspired policies can help us do this at the lowest cost.
- Taxes and cap and trade are proven effective tools to fight climate change!
- Other tools may also be necessary.



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Thank you!

Any Questions?

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