


# Climate Change Economics

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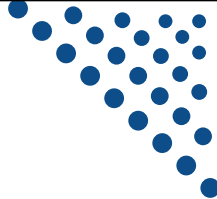


## Thaxter Sharp's Cocktail Party

July 21, 2020

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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: 48 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: 500+ 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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## Available NEED Topics Include:

- **US Economy**
- **Economic Inequality**
- **Climate Change**
- **US Social Policy**
- **Trade and Globalization**
- **Economic Mobility**
- **Trade Wars**
- **Housing Policy**
- **Federal Budgets**
- **Federal Debt**
- **2017 Tax Law**
- **Autonomous Vehicles**

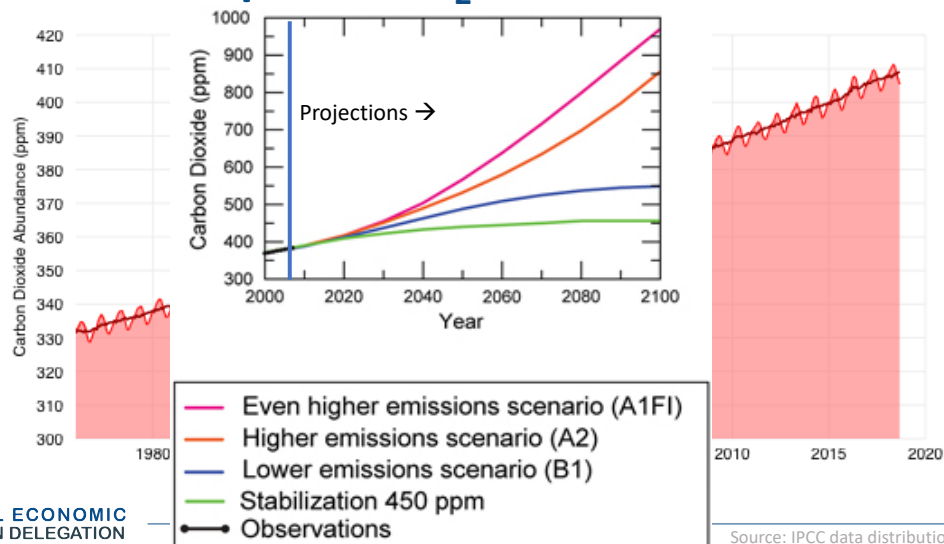
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## Credits and Disclaimer

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## Greenhouse gas emissions from humans increase atmospheric CO<sub>2</sub> concentrations



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## **A** Climate Change Ladder: Think About Impacts in Three Stages

- **Mitigation (a.k.a. Abatement)**
  - Reducing greenhouse gas emissions → reducing climate change
- **Adaptation**
  - Given some amount of climate change, people make costly changes to their behavior to reduce the impacts
- **Damages**
  - But in the end there are still some impacts that hurt people



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## **W**hat Are the Climatic / Planetary Impacts of Atmospheric Greenhouse Gas Buildup?

- **Increased temperatures**
  - Sea level rise
  - Storm surges
- **Altered precipitation patterns**
- **More variable weather**
- **More / more powerful storms**
- **Carbon dissolves in ocean**



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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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## Cost-Benefit Analysis of Fighting Climate Change and Its Effects

- Most economic models suggest the costs of keeping warming below 2°C are relatively small, amounting 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.**



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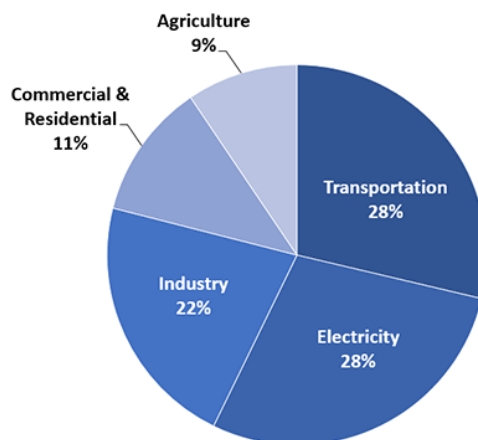
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## Global Net Emissions Are What We Care About

- **For climate impacts, we don't care where they are emitted, only how much**
  - There may be other local impacts
- **Gross emissions (greenhouse gas sources): how much greenhouse gases (incl. CO2) we put out**
- **Greenhouse gas sinks: ways to pull CO2 out of the air**
  - Existing: oceans, forests
  - Increase sinkage by planting trees, or other measures

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## Total U.S. Greenhouse Gas Emissions by Economic Sector in 2016



U.S. Environmental Protection Agency (2018). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2016

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## Policies That Reduce Emissions Directly

- **Command and control regulation**
  - Emissions standards or limits (e.g., Clean Water Act discharge limits)
  - Tech standards (e.g., require scrubbers on power plants)
- **Incentive-based policies: Putting a price on emissions**
  - Tax or cap & trade
  - Subsidizing green energy (e.g., feed-in tariffs)
  - Economists prefer these over command and control; greenhouse gas emissions get an **unfair advantage** in the market because some of the costs of greenhouse-gas producing activities are imposed on other people in the form of climate change costs; but these policies **level the playing field**



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## Command and Control vs. Incentive-Based Regulation


- **Efficiency**
  - Both can achieve the same amount of emissions reduction.
  - Incentive-based policies can achieve emissions reduction at much lower cost.
- **Equity**
  - Both have regressive impacts (low-income families bear costs that are a larger percent of their incomes).
  - Cap and trade and carbon tax can generate revenues that can be used to offset the regressivity.
  - Command and control regulations do not.



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## Other Example Policies that Reduce Emissions

- R&D subsidies
- Renewable energy mandates (e.g., renewable portfolio standards)
- Energy efficiency mandates and subsidies (e.g. CAFE fuel economy standards)
- Grid / infrastructure improvements
- Public transportation
- Land use / zoning policies

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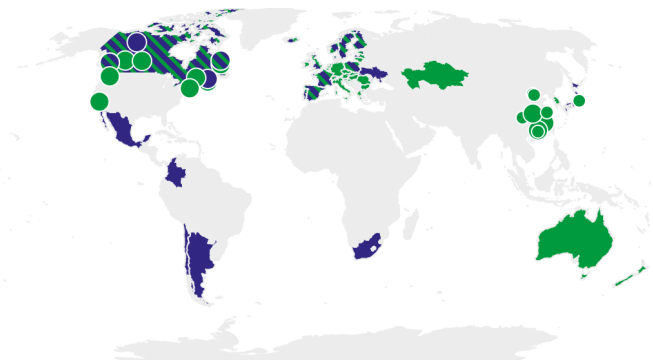
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## Climate Policies Across the World

Summary map of regional, national and subnational carbon pricing initiatives

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**STATUS**

Implemented

Scheduled

Under consideration

**TYPE OF INSTRUMENT**

Carbon tax

ETS

Undecided

**TYPE OF JURISDICTION**


National

Regional

Subnational

● ETS implemented or scheduled for implementation  
● ETS or carbon tax under consideration  
● ETS implemented or scheduled, ETS or Carbon Tax under ...

● Carbon tax implemented or scheduled for implementati...  
● ETS and carbon tax implemented or scheduled  
● Carbon tax implemented or scheduled, ETS under consid...


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Source: World Bank Carbon - Pricing Dashboard

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## California's Cap and Trade System: 2012+



0.7%

of global greenhouse gas emissions




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## California's AB32: Global Warming Solutions

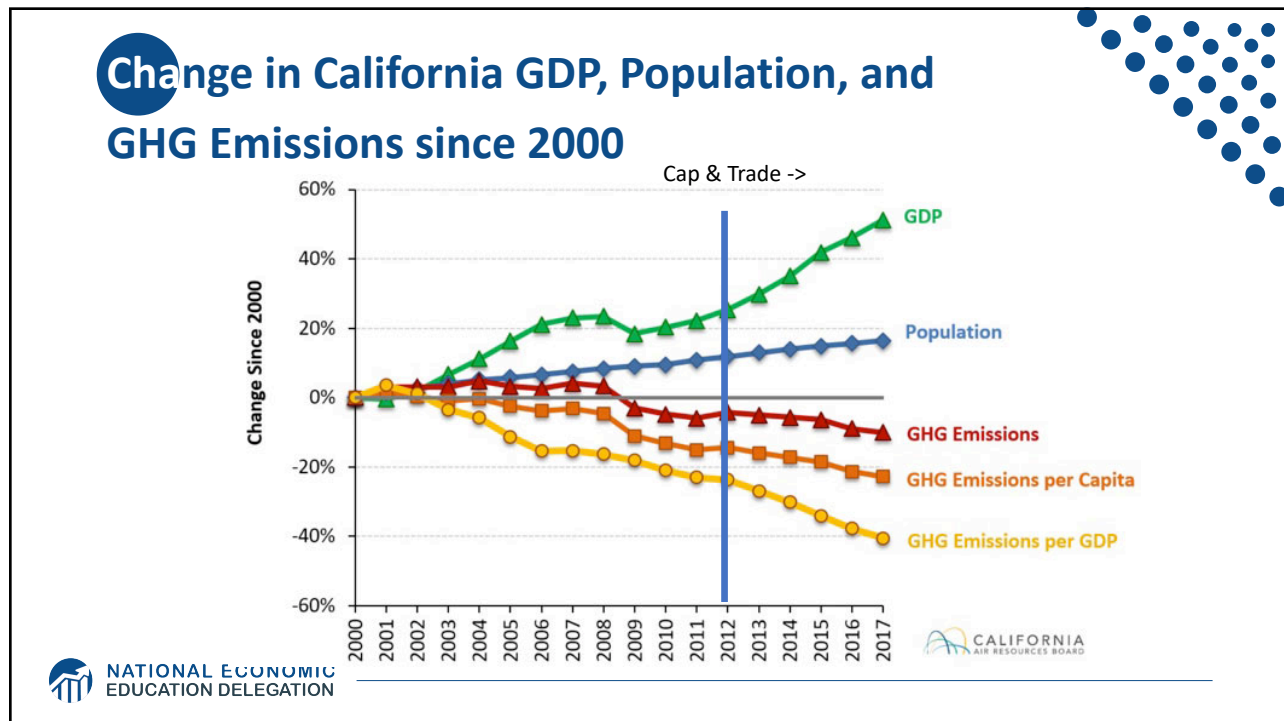


- **California's goals:**
  - Reduce emissions to 1990 levels by 2020
  - An 80% reduction in emissions from 1990 levels by 2030
- **California's Tools:**
  - Cap and Trade
  - Renewable Portfolio Standard
  - Clean Cars Program
  - Low Carbon Fuel Standard



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## Summary

- **Climate change is real, is caused by human actions, and has impacts we're already feeling.**
- **We need smart policy to reduce greenhouse gas emissions by the right amount and at the lowest possible cost.**
  - For example, cap and trade and emissions taxes!
- **We also need policies to help with adaptation and support those bearing the greatest damages.**

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**Thank you!**

## Any Questions?

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