Pragmatism and Climate Policy

EES 3310/5310

Global Climate Change

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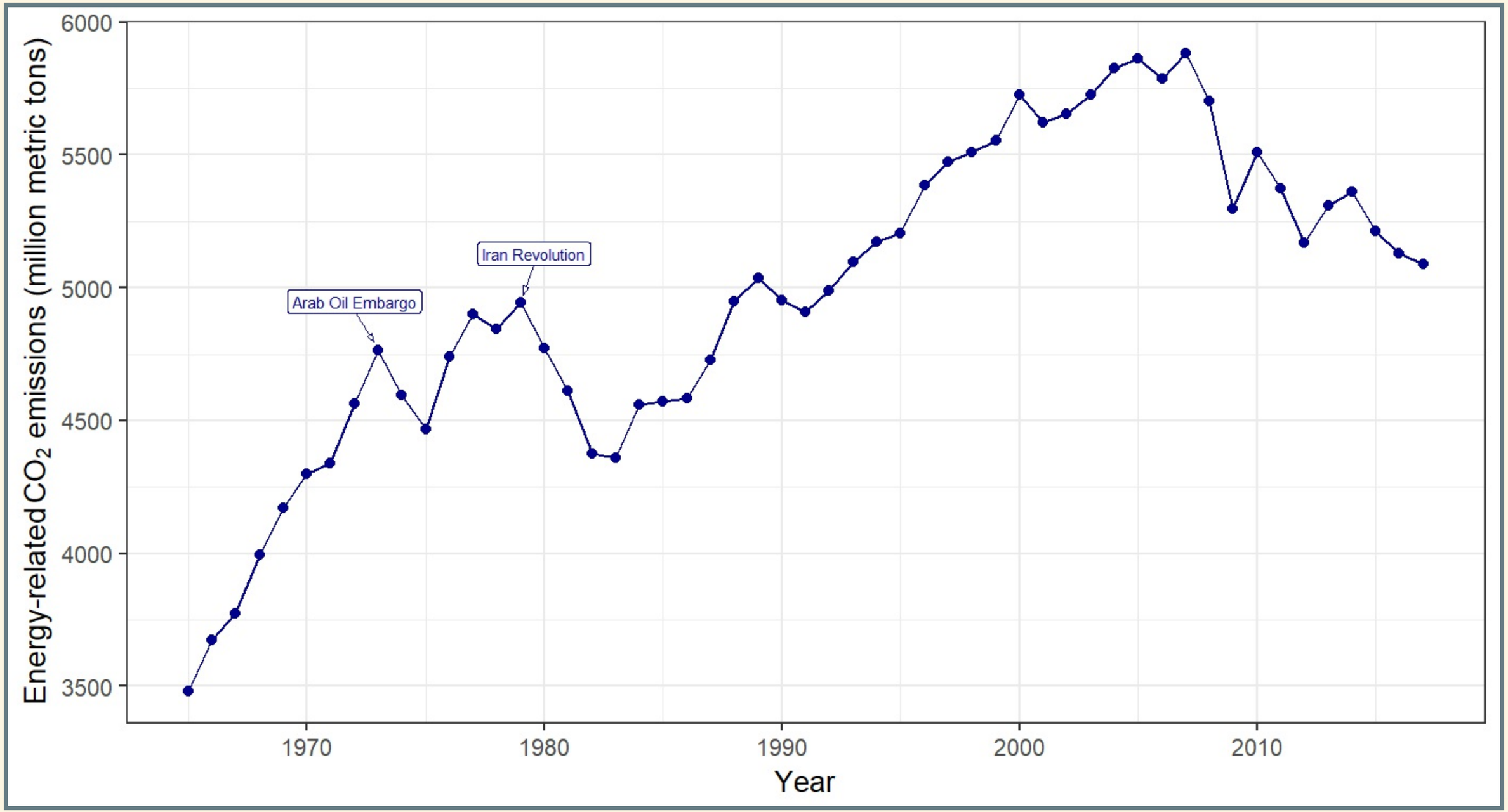
Class #38: Monday Nov. 26 2018

Challenges of Decarbonization

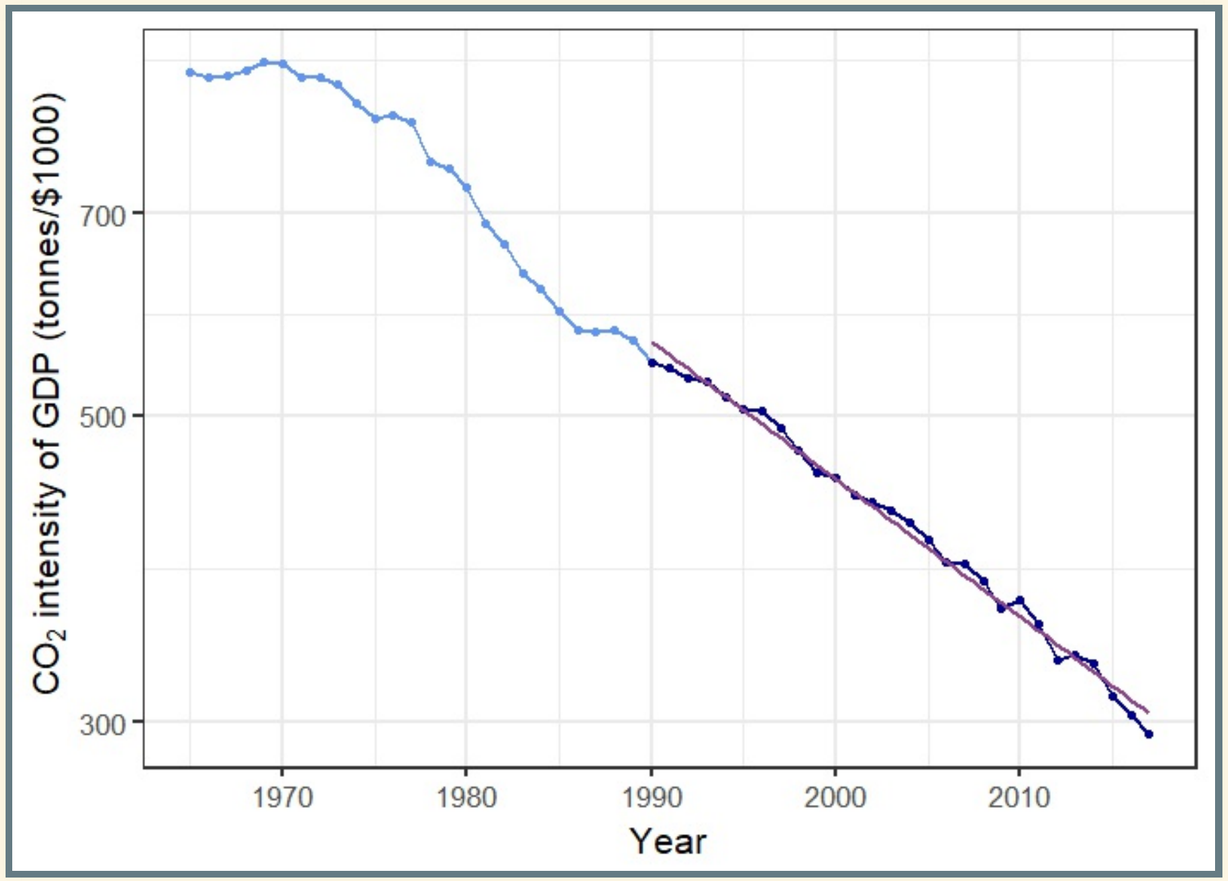
Challenges of Decarbonization

- How hard will it be to reduce CO_2 emissions?
  - Nordhaus:
    - What technology can replace fossil fuels?
    - What policies can stimulate innovation, investment, production, purchase of clean technology?
  - Pielke:
    - The biggest challenge is cost: $RE < C$
    - Make clean technology cheaper than fossil fuels and the problem is solved.

Perspective: US CO_2 Emissions

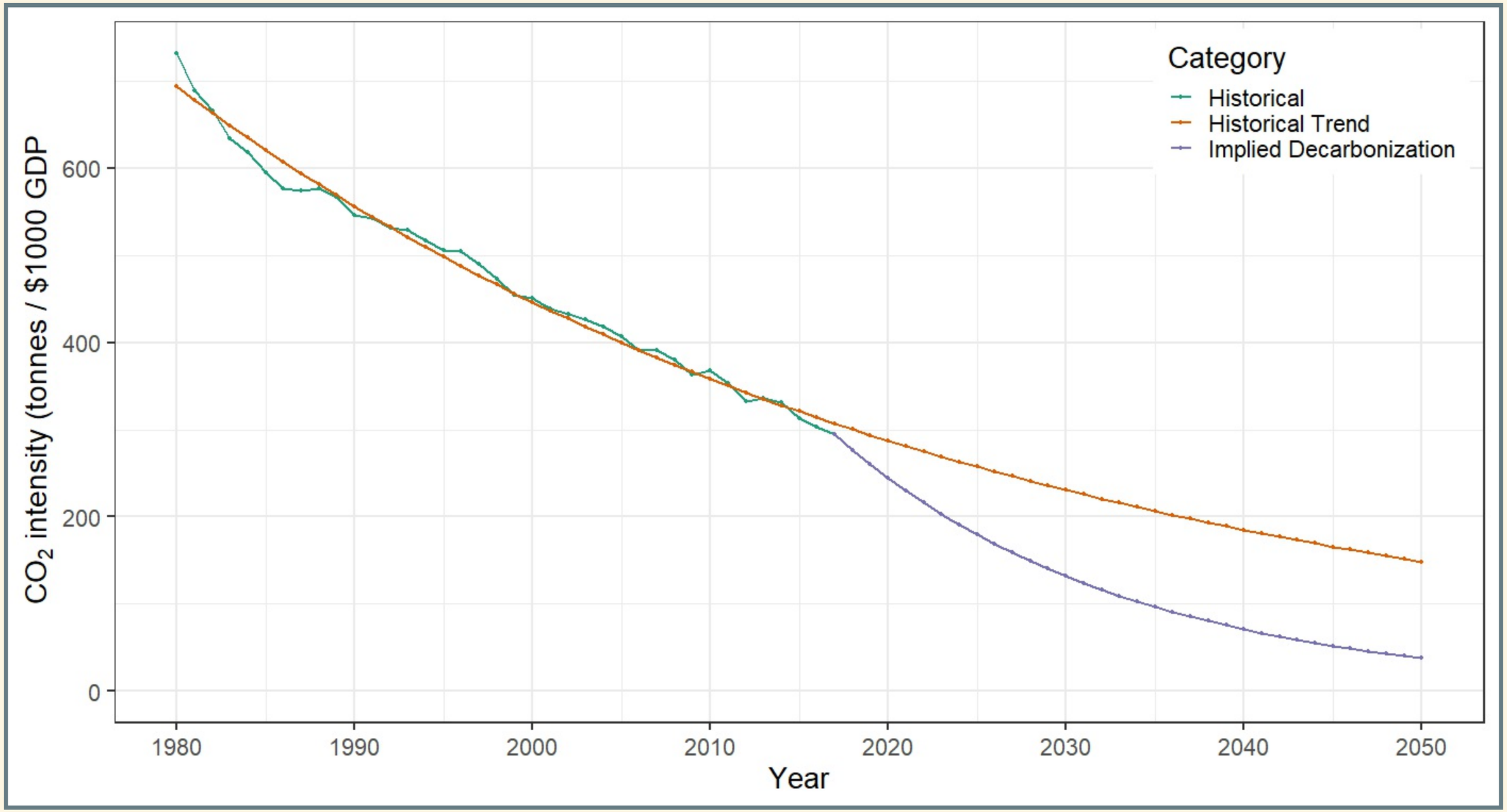


Rate of Decarbonization

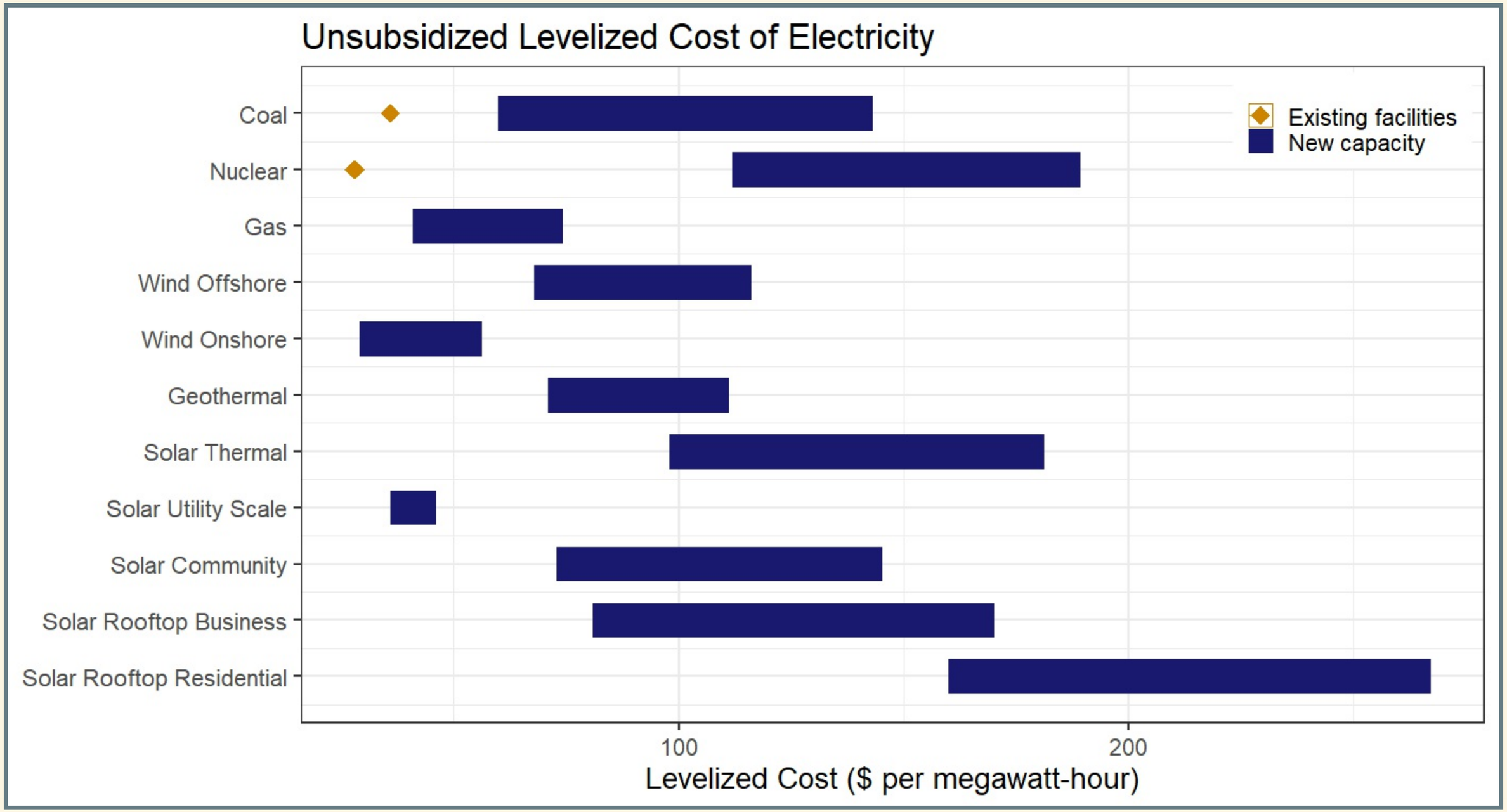


- 2009 policy goal: US emissions 83% less than 2005 by 2050
- *ef* must drop by 6.2% per year
- Actual rate has been about 2.2% per year

Implied Decarbonization



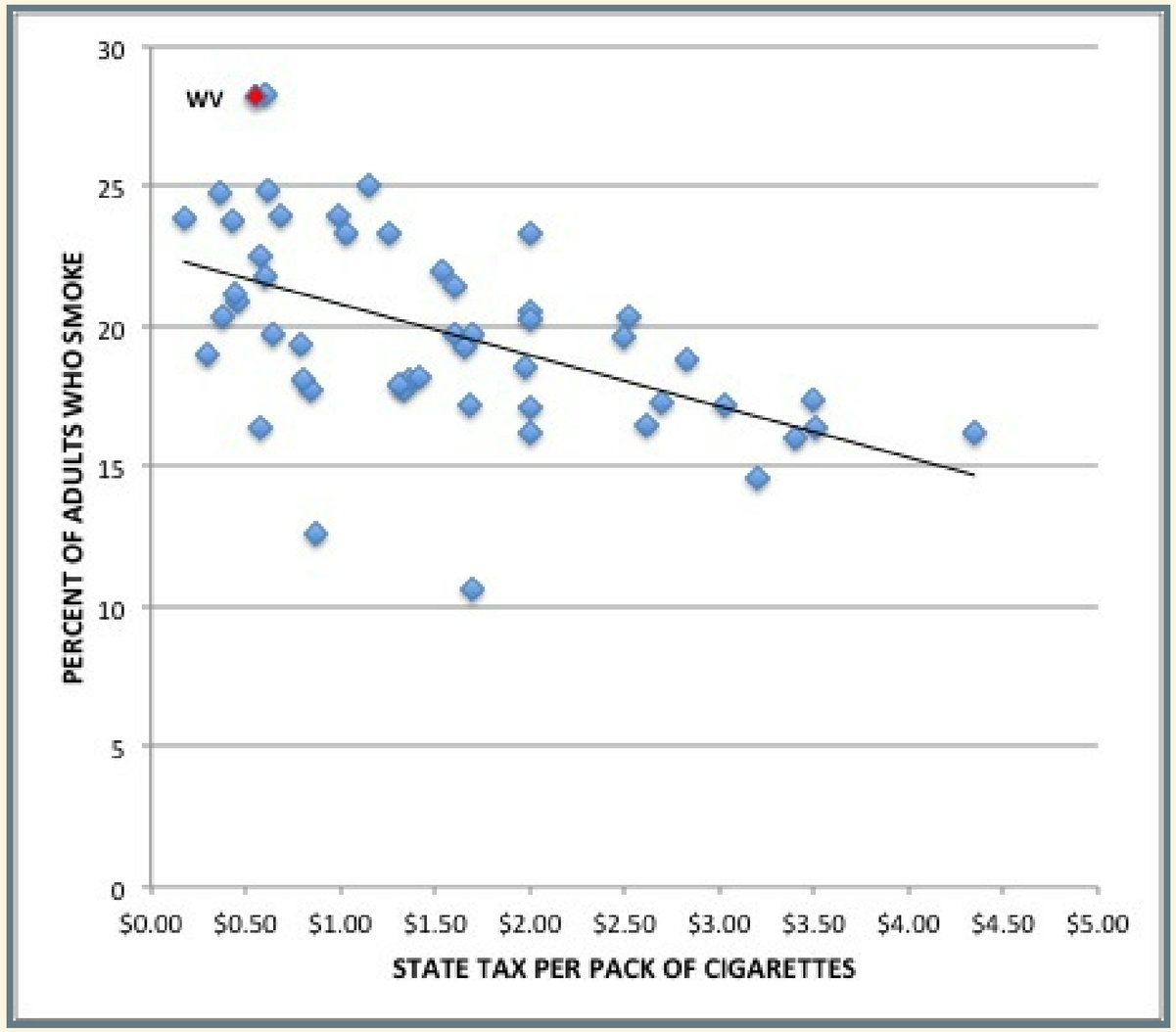
Cost of Decarbonization



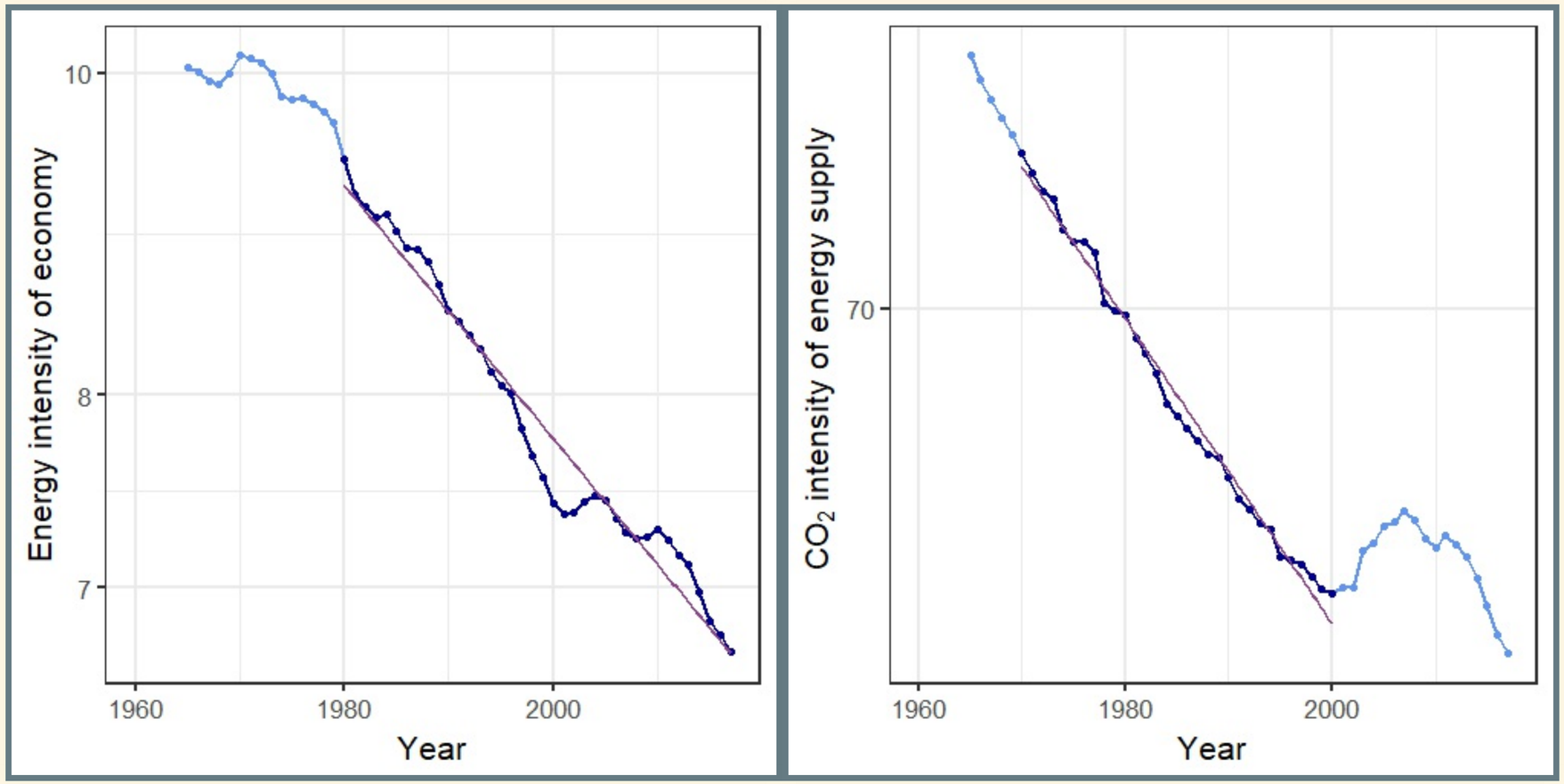
Pielke's Views

Tax on death?

- What do you think of Pielke's argument?



Challenge of decarbonizing



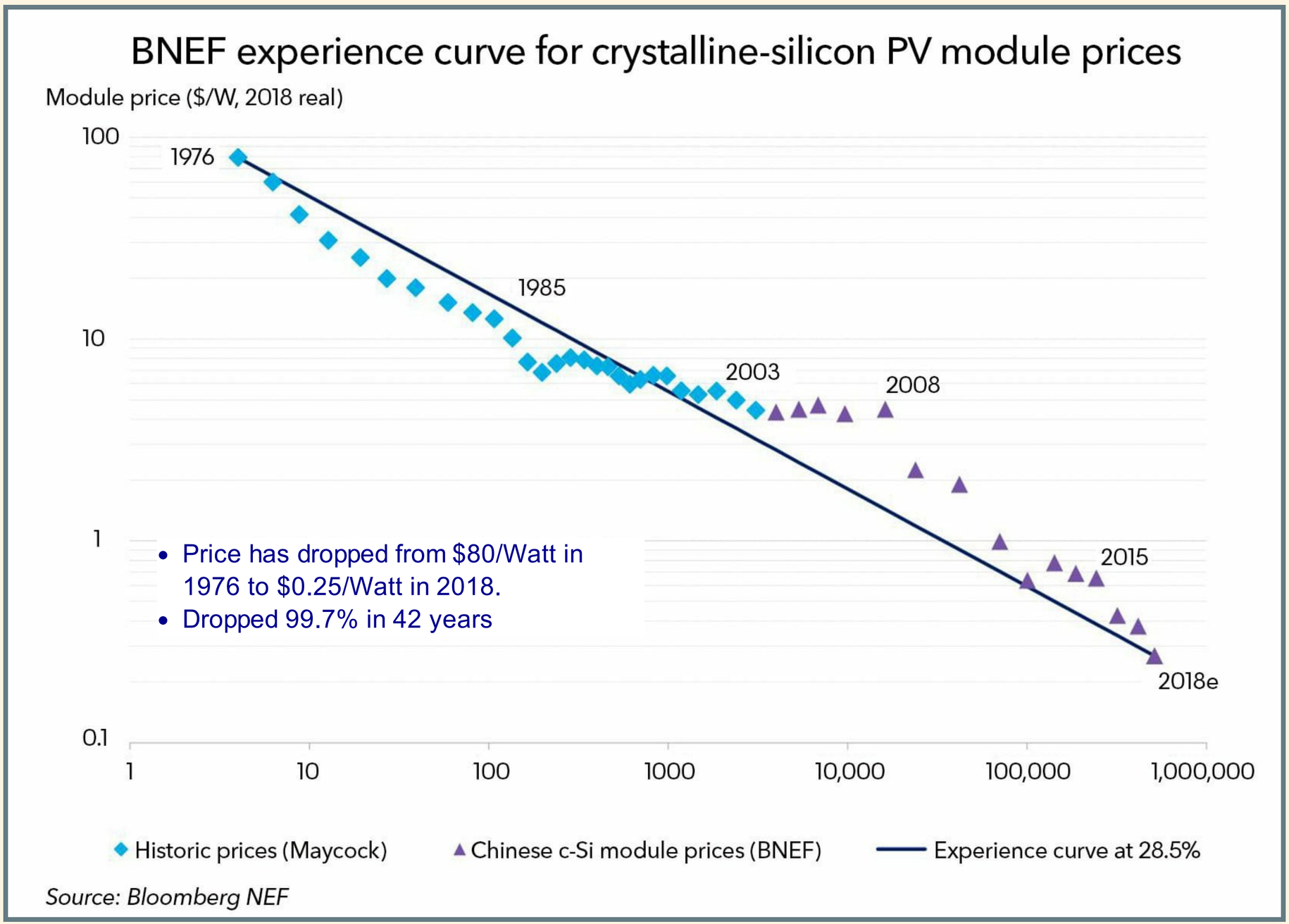
- Trend in *e* (1980–present): 0.9% per year.
- Trend in *f* (1970–2000): 0.5% per year.
  - Trend stopped in 2000, but rapid decrease since around 2008.
- So far: Decarbonization driven much more by efficiency than clean energy.
- Rebound: greater efficiency → more consumption.

Energy Poverty

- 1.2 billion people (17% of planet) lack access to electricity
- 2.7 billion (38%) lack clean cooking facilities
- 95% in sub-Saharan Africa or developing Asia

Nordhaus's Perspective

Innovation


BNEF experience curve for crystalline-silicon PV module prices
Module price ($/W, 2018 real)
100
10
1
0.1
1976
1985
2003
2008
2015
2018e
1
10
100
1000
10,000
100,000
1,000,000
Price has dropped from $80/Watt in 1976 to $0.25/Watt in 2018.
Dropped 99.7% in 42 years
Historic prices (Maycock)
Chinese c-Si module prices (BNEF)
Experience curve at 28.5%
Source: Bloomberg NEF

Innovation Policy

- Knowing price of CO_2 will rise provides incentive to invest in R&D
- Valley of Death:
  - Technology looks promising in laboratory
  - Potential for big profits
  - Many years, lots of money to turn laboratory device into product
    - Product development might fail
    - Prodduct might not sell
    - Competitors might copy product
    - Valley of death
  - Government support to cross valley of death

Pielke’s Policy Proposal

Pielke's Policy Proposal:

- Competition within government
- Public-works model
- Demonstration projects
- Government as consumer of energy innovations
- $5/ton carbon tax ($0.04 per gallon gas)
  - invest in clean-energy R&D
- Monitor progress
- Develop "plan B" (geoengineering)

Obliquity

- Appeal to people who don’t care about climate change
  - Cheaper energy
  - Reduce pollution (smog, etc.)
  - Reduce dependence on foreign oil