

# Obstacles and Perspectives

EES 3310/5310

Global Climate Change

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Class #41: Monday, Dec. 3 2018



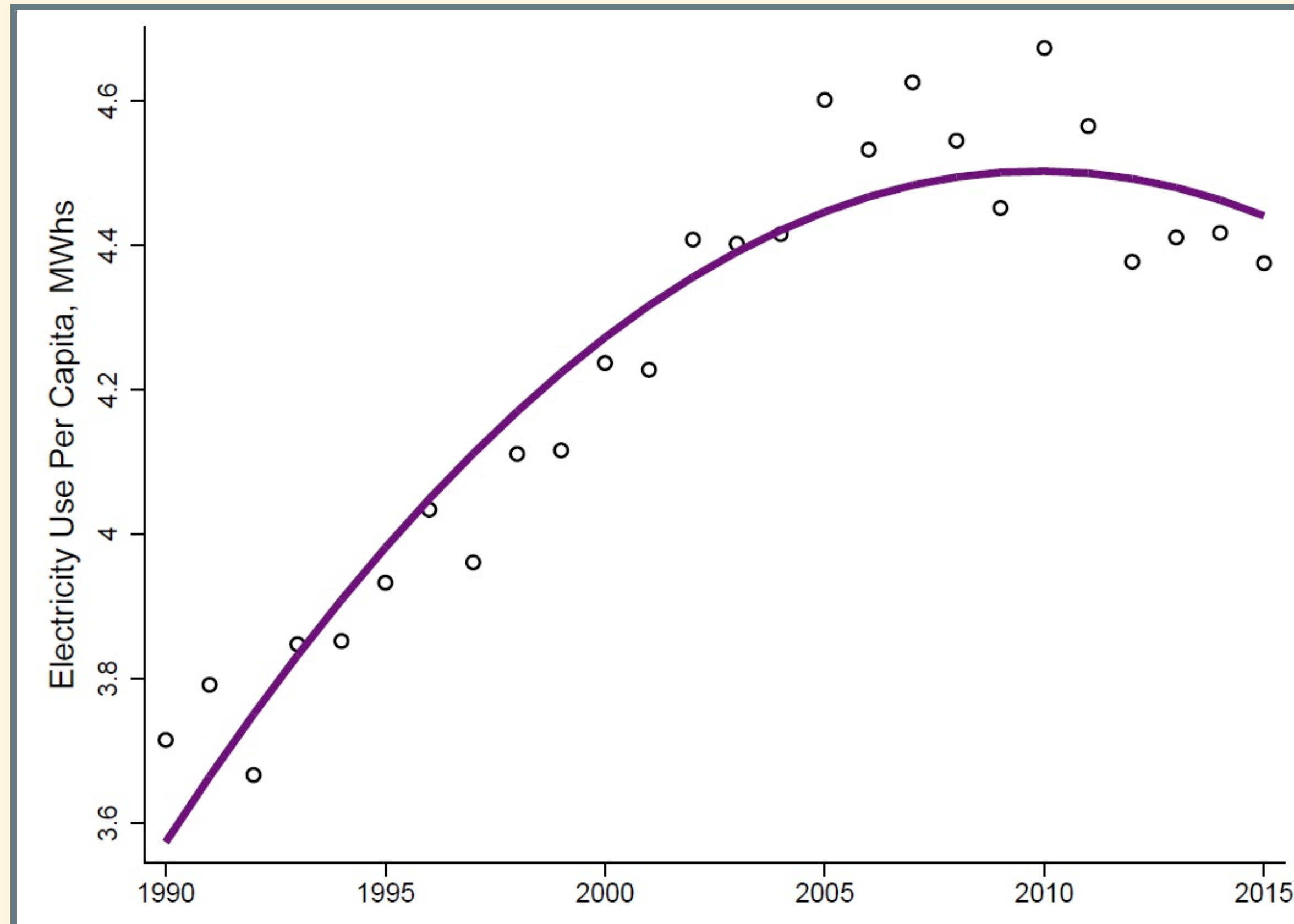
# Lab Presentations

Upload slides to Box folder [EES-3310-5310-Lab-Presentations/Country Decarbonization Project](#)  
(Shared with you from the first presentation)

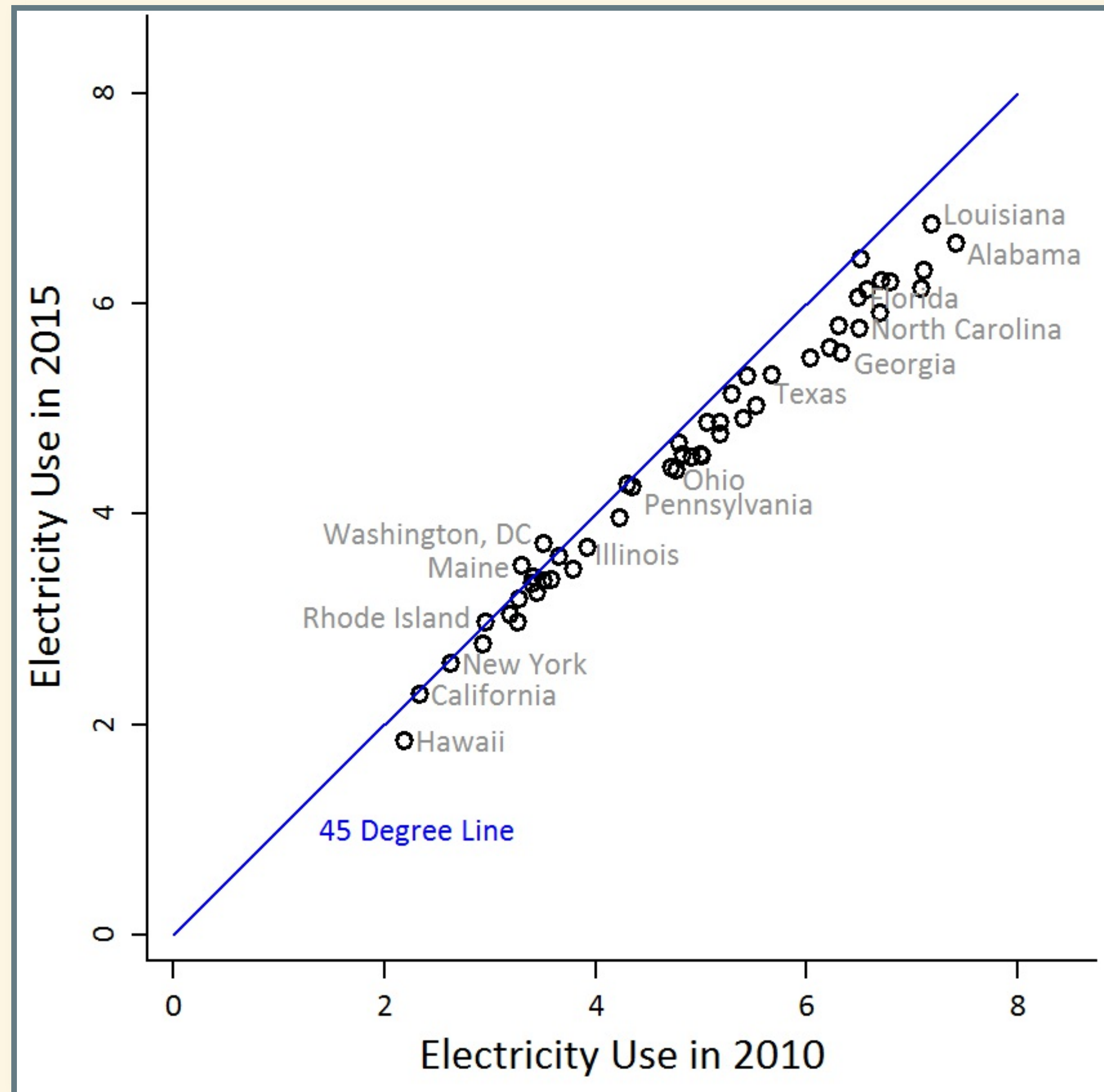
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# Private Governance (Continued)

# Recent Developments: Household Electricity Use



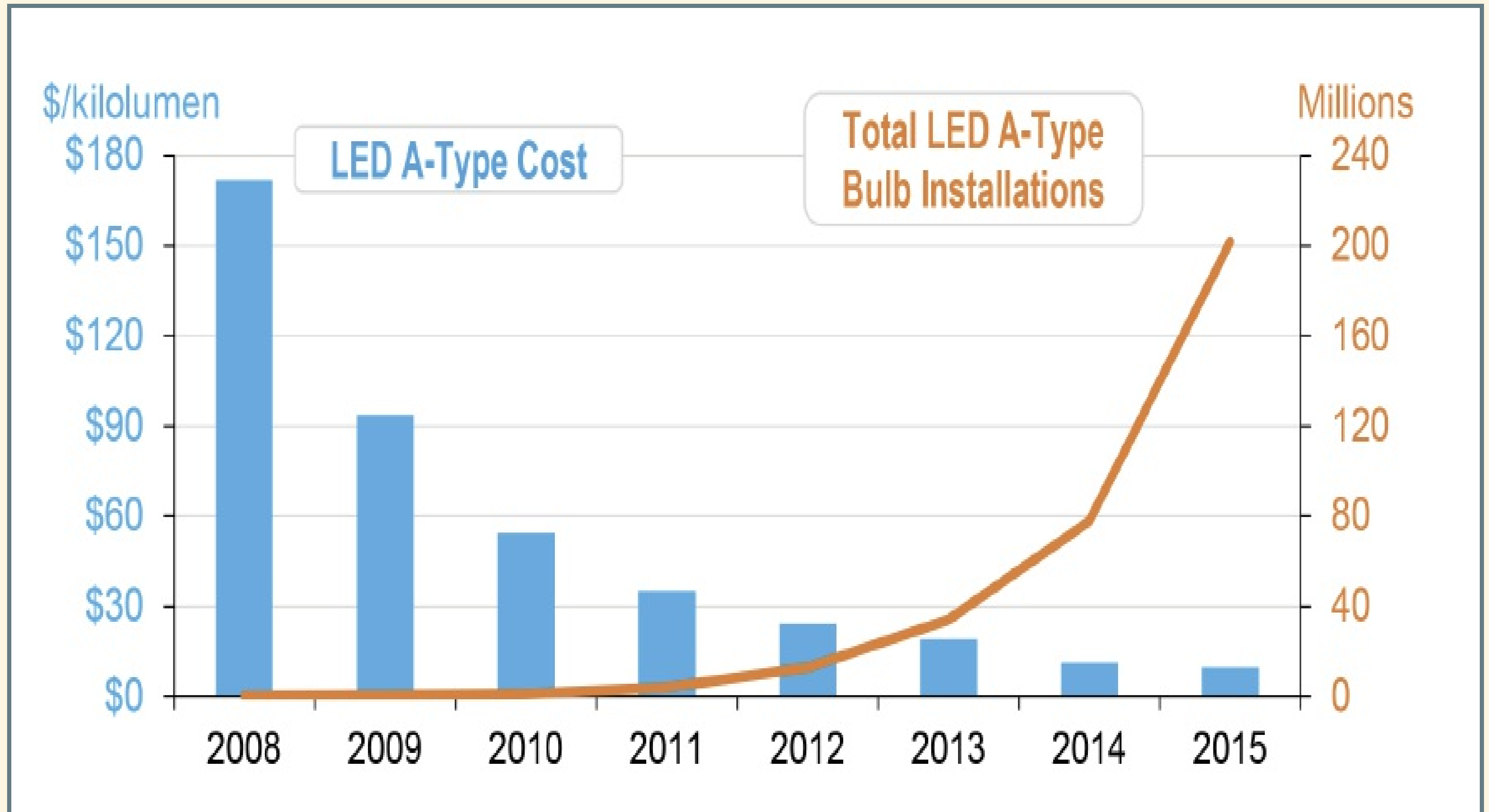
# Reductions in 48 States



# Private Governance

- 2007: WalMart sets and exceeds goal of selling 100 compact fluorescent light bulbs in one year.
  - Meets goal in 10 months
- 2011: WalMart launches competition among suppliers:
  - Best high-quality LED bulb under \$10: We will help you sell hundreds of millions!
- 2013: WalMart teams up with TCP to launch 60W equivalent bulb for less than \$9
- Replacing 5 most used bulbs in your house with LEDs will save around \$75/year

# LED Light Bulb Sales



# Conclusions



# Conclusions

- Private governance can likely reduce global emissions by more than 1 billion tons per year rapidly
- This isn't even close to solving the whole climate problem
- But it can help considerably, and buy time to enact other measures before it's too late.

# Obstacles to Climate Policies

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1. Prisoners of Nationalism
2. Prisoners of the Present
3. Prisoners of Partisanship
4. Prisoners of Self-Interest

# Game Theory: Nationalism and Prisoner's Dilemma

# Free Riding: Five Countries

Tons Abated	Marginal Cost	Marginal Benefit	Cumulative Cost	Cumulative Benefit
0	0	25	0	25
1	3	25	3	50
2	6	25	9	75
3	9	25	18	100
4	12	25	30	125
5	15	25	45	150
6	18	25	63	175
7	21	25	84	200
8	24	25	108	225
9	27	25	135	250
10	30	25	165	275

- Five Countries
  - Benefits for each ton of abatement by anyone:
    - Each country: \$5
    - World: \$25 (\$5 for each of 5 countries)

# Free Riding: Five Countries

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7	21	25	84	200
8	24	25	108	225
9	27	25	135	250
10	30	25	165	275

- If everyone abates 8 tons:
  - Each country pays \$108
  - Total abatement =  $5 \times 8 \text{ tons} = 40 \text{ tons}$
  - Each country benefits  $40 \times \$5 = \$200$
  - Each country comes out \$92 ahead
  - Total: World is ahead  $\$92 \times 5 = \$460$

# Free Riding: Five Countries

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9	27	25	135	250
10	30	25	165	275

- If everyone abates 8 tons:
  - Each pays \$108, benefits \$200
  - Each country comes out \$92 ahead
  - Total: World is ahead \$460
- Four abate 8 tons, one abates 1 ton
  - Four pay \$108, one pays \$3
  - Total abatement = 33 tons
  - Each country benefits  $33 \times \$5 = \$165$
  - 4 are \$57 ahead, one is \$162 ahead
  - World is ahead \$390

# Free Riding: Five Countries

Tons Abated	Marginal Cost	Marginal Benefit	Cumulative Cost	Cumulative Benefit
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- If everyone abates 8 tons:
  - Each country comes out \$92 ahead
  - Total: World is ahead \$460
- 4 abate 8 tons, one abates 1 ton
  - 4 are \$57 ahead, one is \$162 ahead
  - World is ahead \$390
- 5 countries each abate 1 ton
  - Each country pays \$3, benefits \$25
  - Each country \$22 ahead
  - World ahead \$110



# Free Riding: Five Countries

Tons Abated	Marginal Cost	Marginal Benefit	Cumulative Cost	Cumulative Benefit
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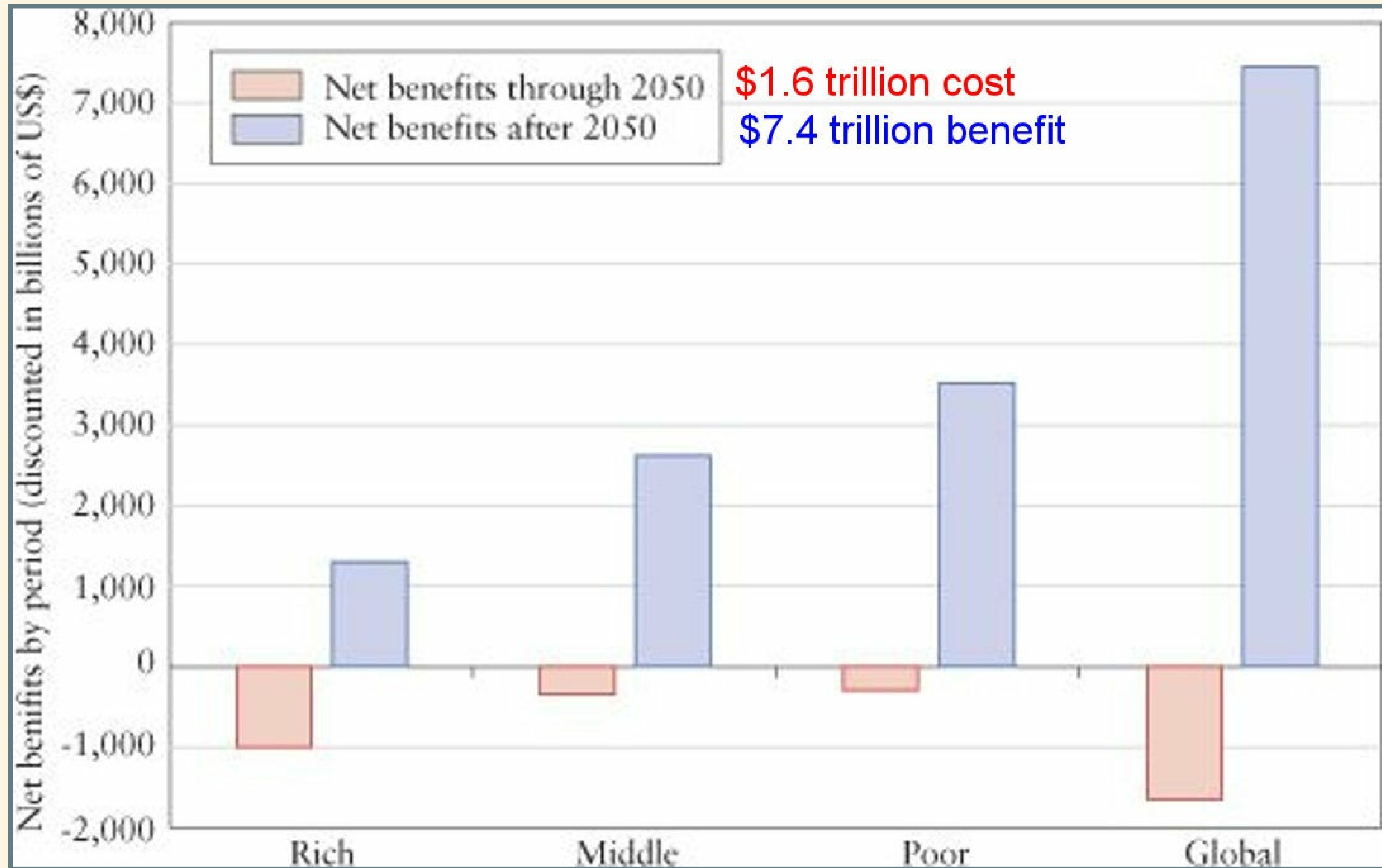
- If everyone abates 8 tons:
  - Each country comes out \$92 ahead
  - Total: World is ahead \$460
- 5 countries each abate 1 ton
  - Each country \$22 ahead
  - World ahead \$110
- 4 abate 1 ton, one abates 2 tons
  - 4 pay \$3, 1 pays \$9
  - Each country benefits \$30
  - 4 are \$27 ahead, one is \$21 ahead
  - World is \$129 ahead  
(\$19 more than when 1 ton each)
  - Country that abated 2 tons is \$1 worse off.

# Nash Equilibrium

- If everyone does the same thing, everyone is best off cutting 8 tons
- If everyone else cuts 8 tons, I am best off cutting 1 ton
- No matter what everyone else does, I am better off cutting 1 ton
- If everyone does what is best for themselves, everyone is worse off than if everyone cooperates
- “Prisoner’s dilemma”

# Prisoners of the Present

# Myopia and Temporal Tradeoffs

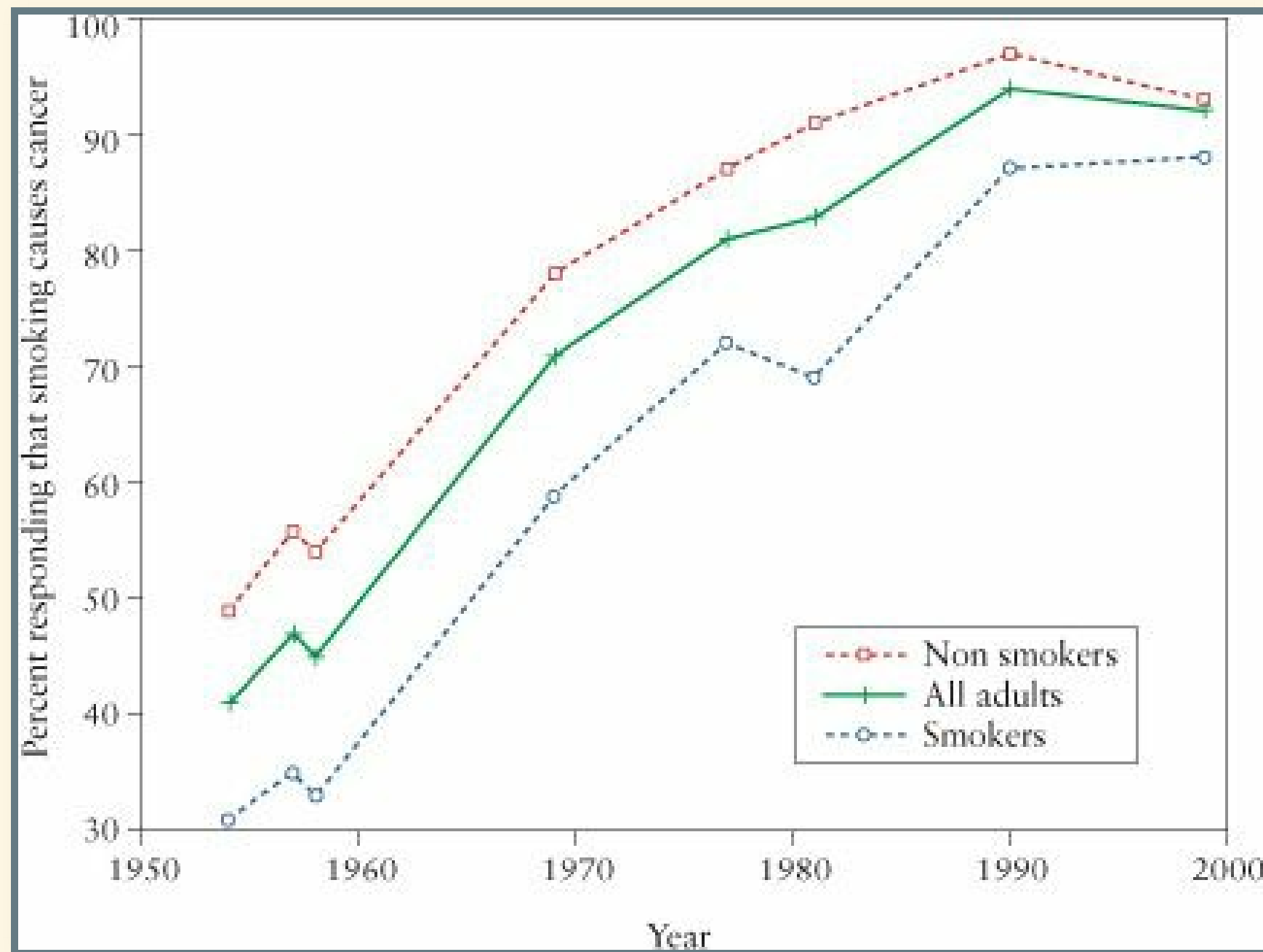


# Prisoners of Partisanship and Self-Interest

# Politics

- Partisanship:
  - 4,000 coal mining jobs per in economy with 140 million jobs
- Merchants of Doubt:
  - Industry spending on misinformation
  - Compare to tobacco:
    - \$30 billion/year tobacco industry
    - \$1000 billion/year energy industry

# Merchants of Doubt



- You can't fool all of the people all of the time
- Compare carbon taxes to tobacco taxes

# Krugman on Nordhaus



# Historical Perspective

- **Early Nordhaus:**
  - Debunker
  - Emphasized high discount rates
  - Estimated relatively small damages from warming
  - Conclusion: No rush to decarbonize, do it slowly and cheaply
- **Later Nordhaus:**
  - Every assessment increases estimates of damage:
    - More urgency: spend more, decarbonize faster
  - Discount rates don't matter as much as he used to think
  - Unmanageable Systems
- Conclusion: Keep warming from going much above 2°C

# Criticisms

- Nordhaus emphasizes carbon pricing
  - Economically this is about balancing multiple factors
  - But one factor is dominant: coal-fired electricity
  - When one factor dominates, stronger case for command-and-control regulation
- Policy target:
  - Criticizes (debunks) 2°C target: “Not very scientific”
  - But concludes optimum target is around 2.3°C
- Big picture:
  - Will *The Climate Casino* change anyone’s mind?