Obstacles and Perspectives

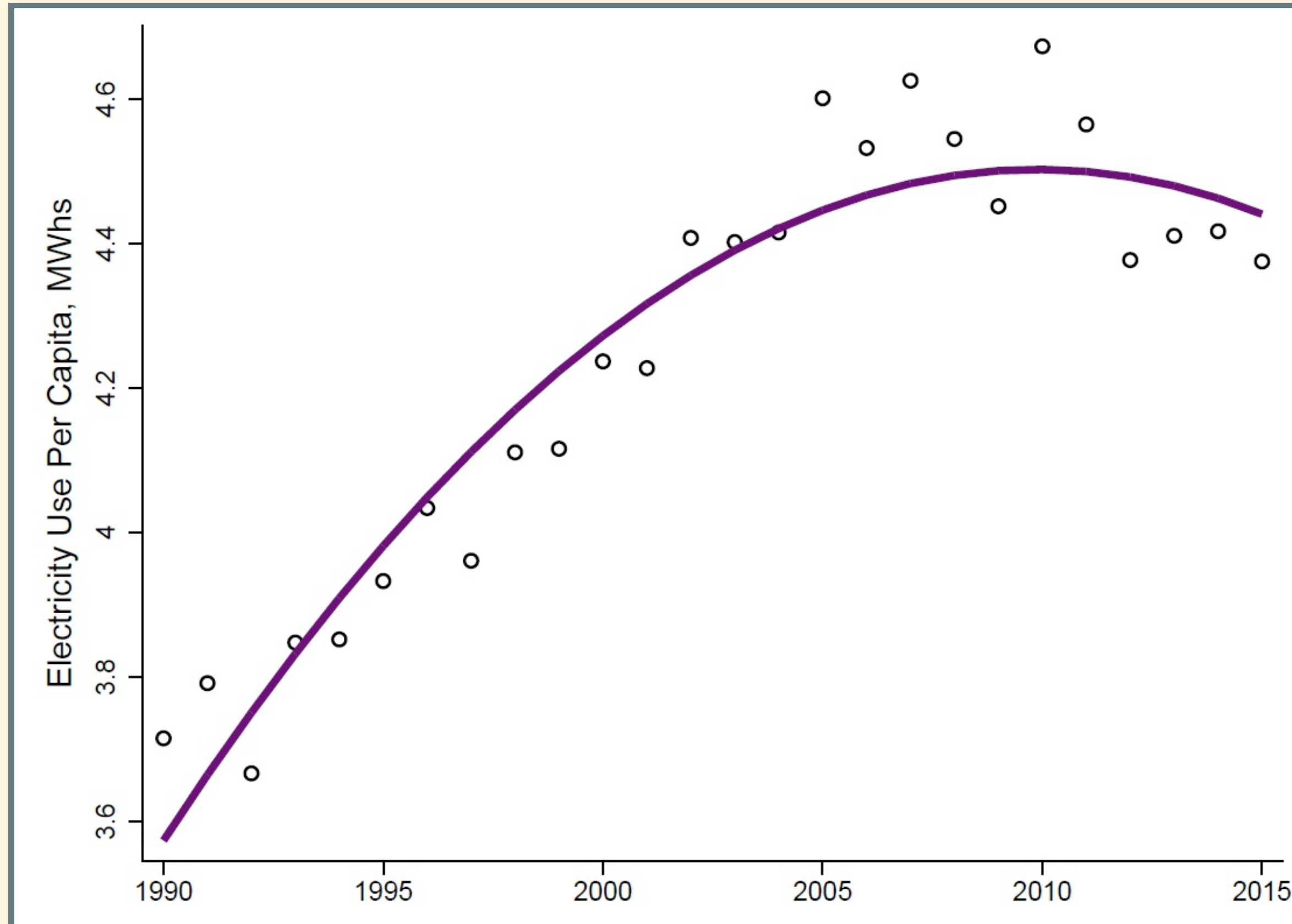## EES 3310/5310

Global Climate Change

Jonathan Gilligan

Class #41: Monday, Dec. 3 2018
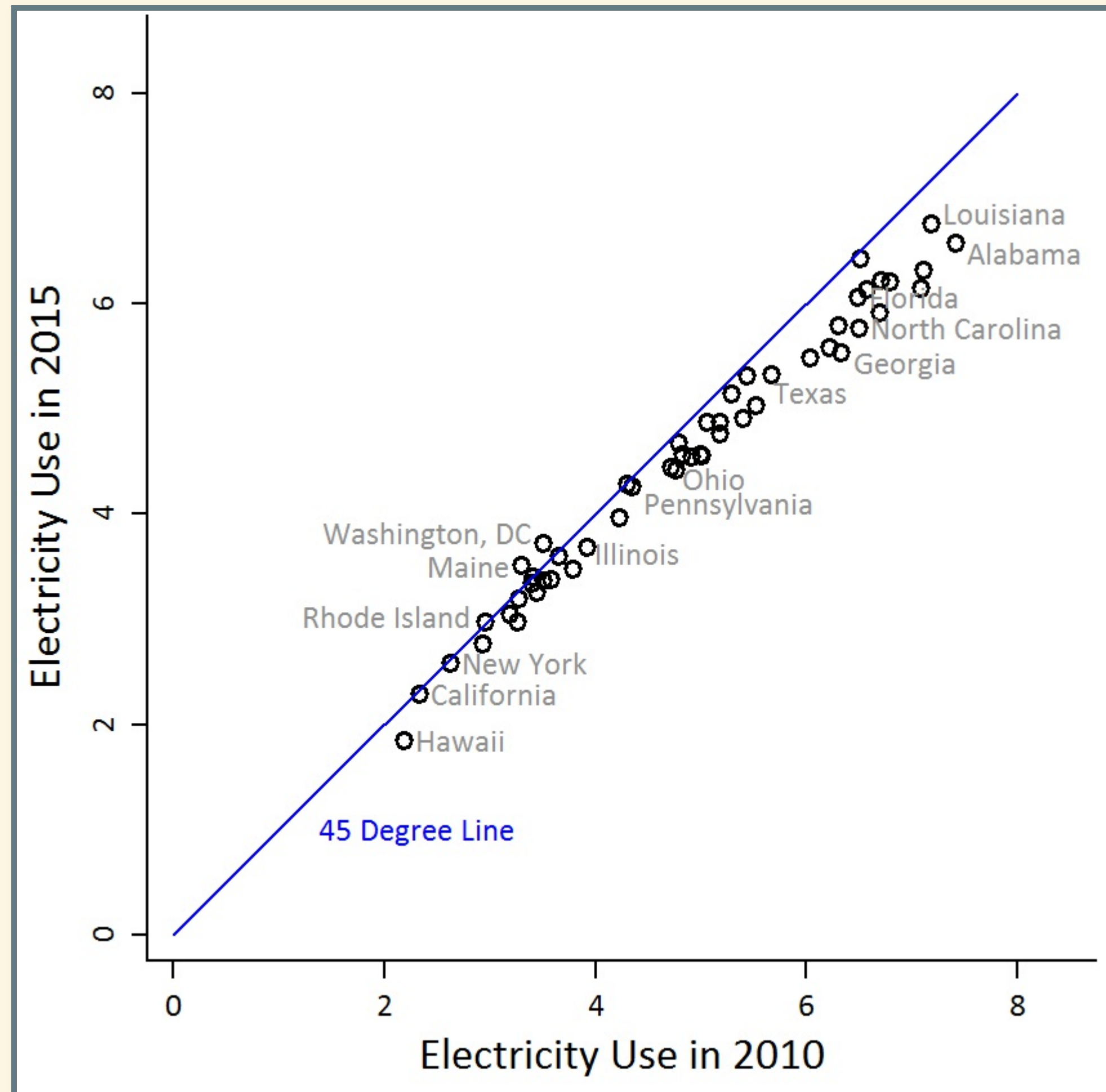
Private Governance (Continued)

Recent Developments: Household Electricity Use
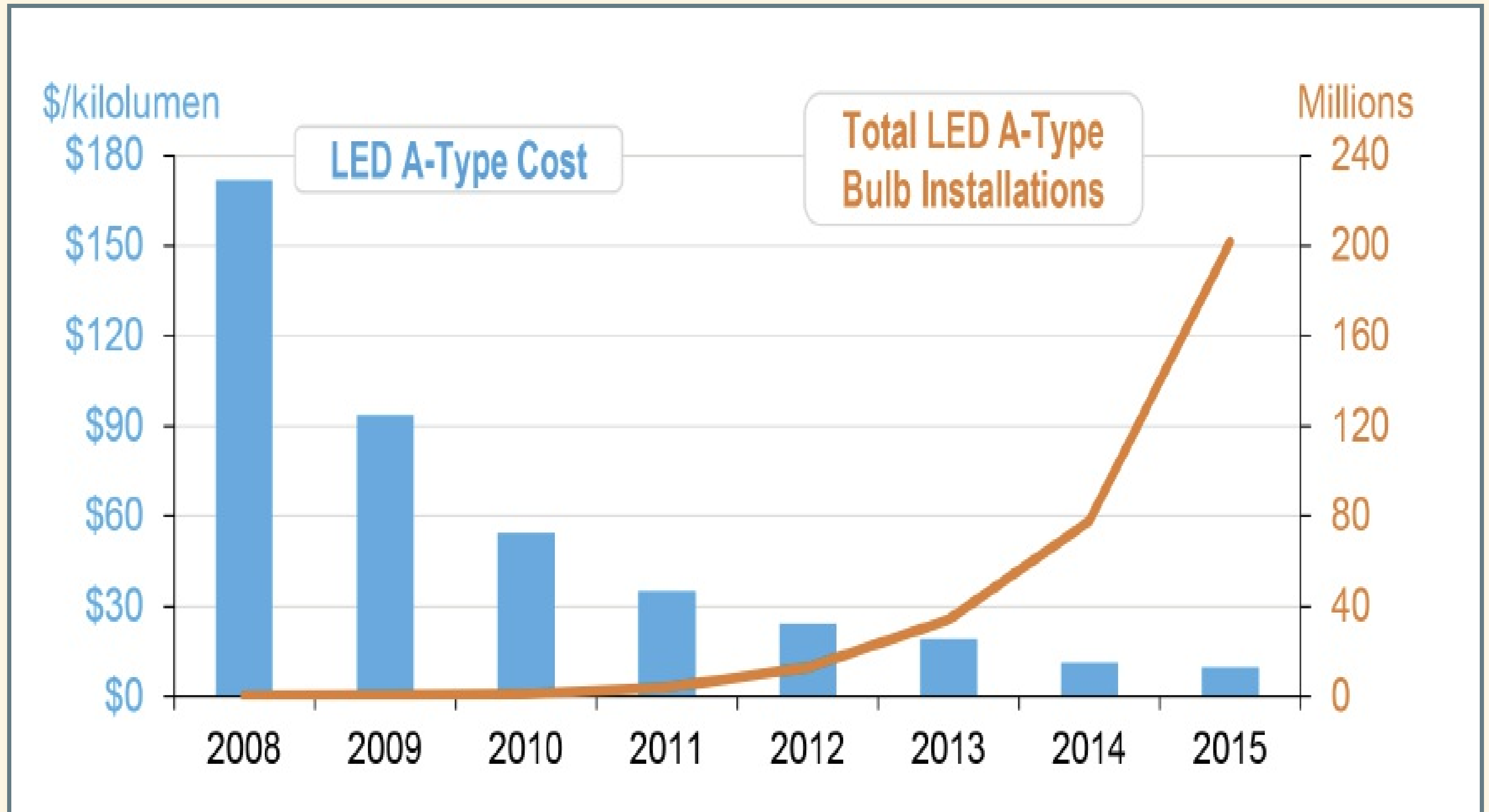
Reductions in 48 States

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

Obstacles to Climate Policies

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	Cumu-lative Cost	Cumu-lative 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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- 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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- 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	Cumu-lative Cost	Cumu-lative 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

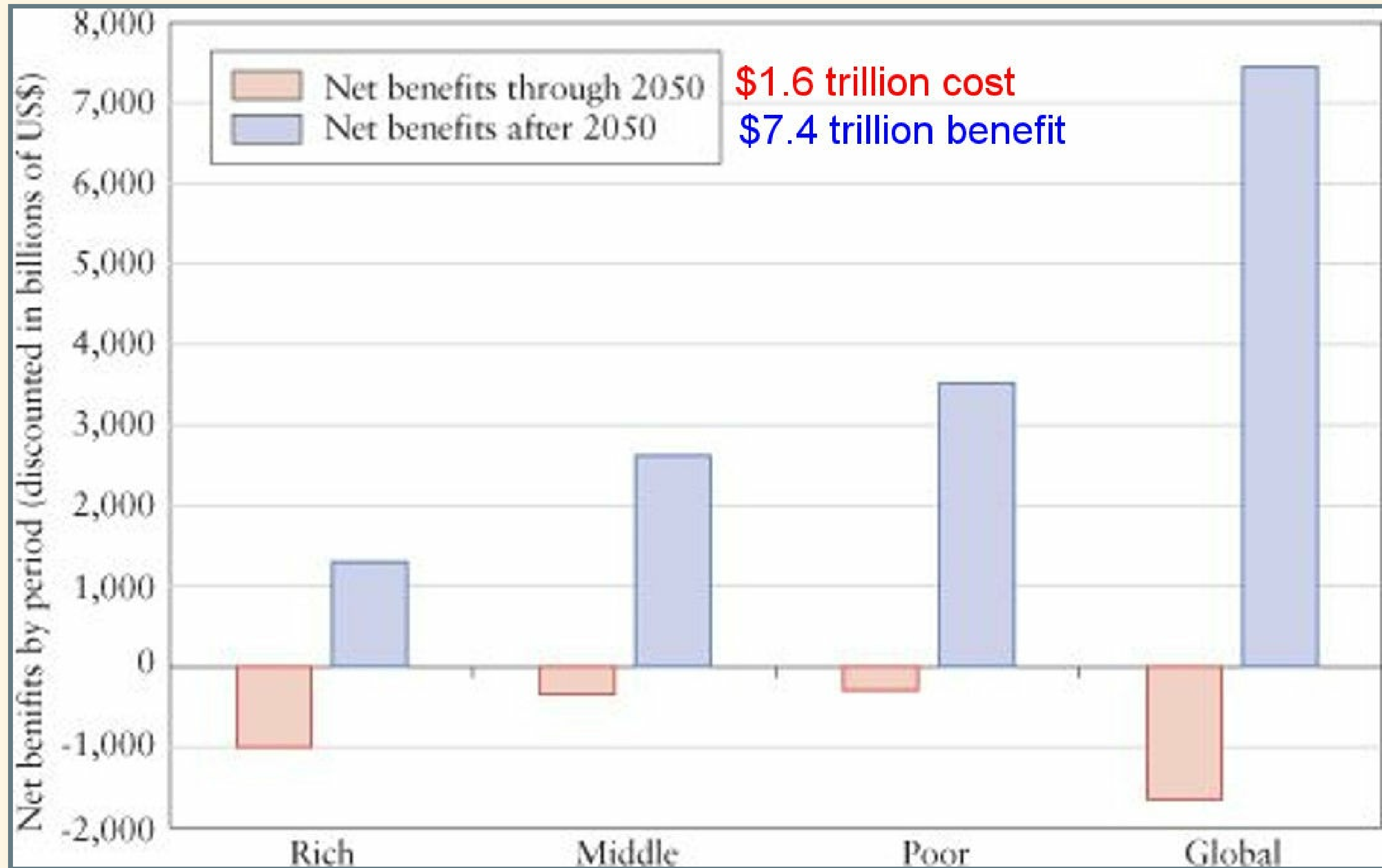| Tons Abated	Marginal Cost	Marginal Benefit	Cumu-lative Cost	Cumu-lative Benefit
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10	30	25	165	275

- 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 themself, everyone is worse off than if everyone cooperates
- "Prisoner's dilemma"

Prisoners of the Present

Myopia and Temporal Tradeoffs

$1.6 trillion cost
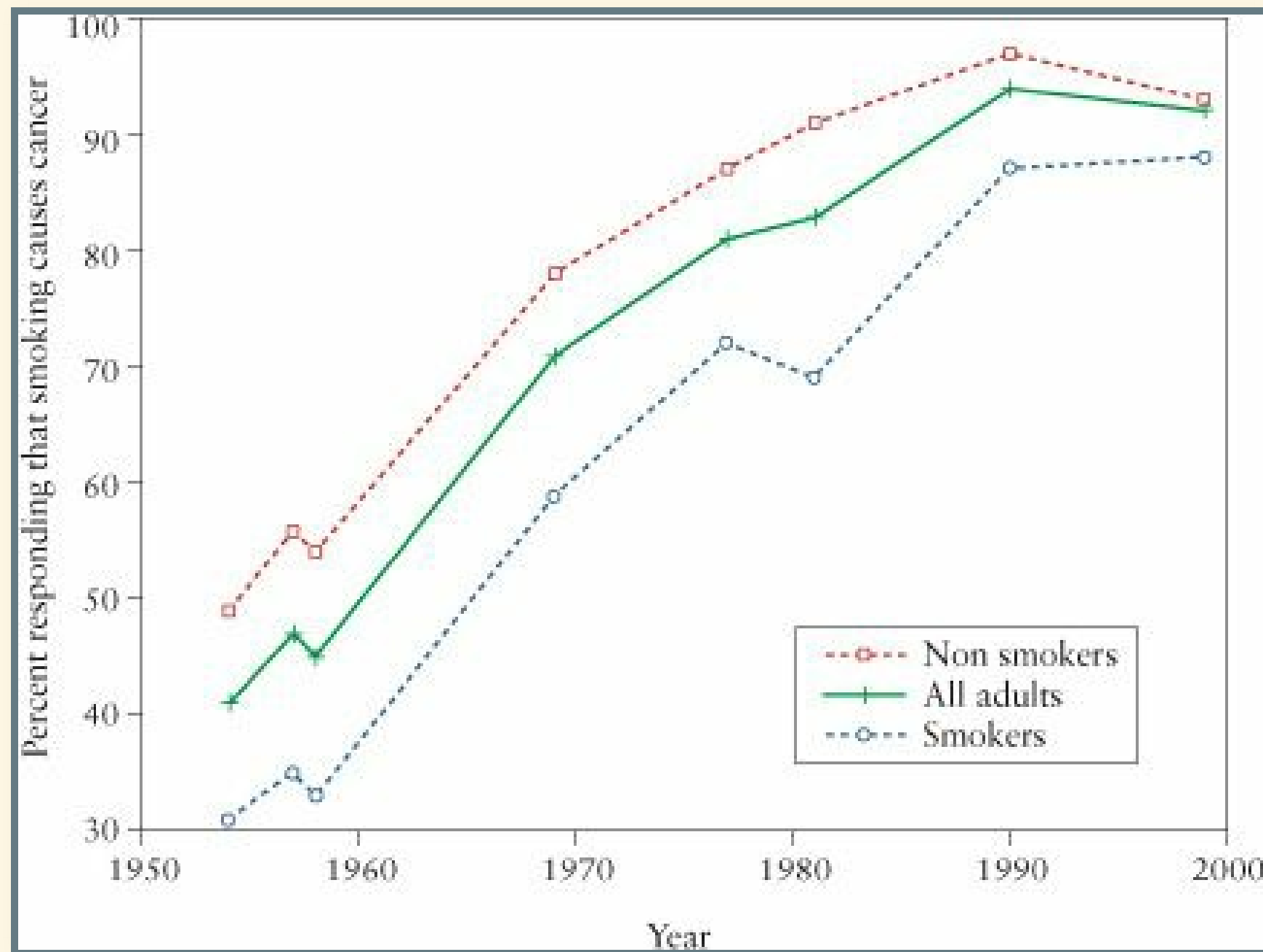$7.4 trillion benefit

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?