

# Outline

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- What is Cap-and-Trade?
- **Some History and Pictures**
- Allocation, Cost, and Electric Power Regulation



# Some History (1)

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- Early credit-based trading (U.S., late 1970s-1980s)
    - Some cost savings, but generally disappointing
  - Leaded-gasoline phase-down (US: 1985-86)
    - 1<sup>st</sup> program w/o individual approval; successful
  - Los Angeles RECLAIM Program (1994- )
    - SO<sub>2</sub> and NO<sub>x</sub>; local; multi-sector
  - US Acid Rain (SO<sub>2</sub>) Program (1995- )
    - Canonical cap-and-trade, very successful
    - National scope, power plants only
- 



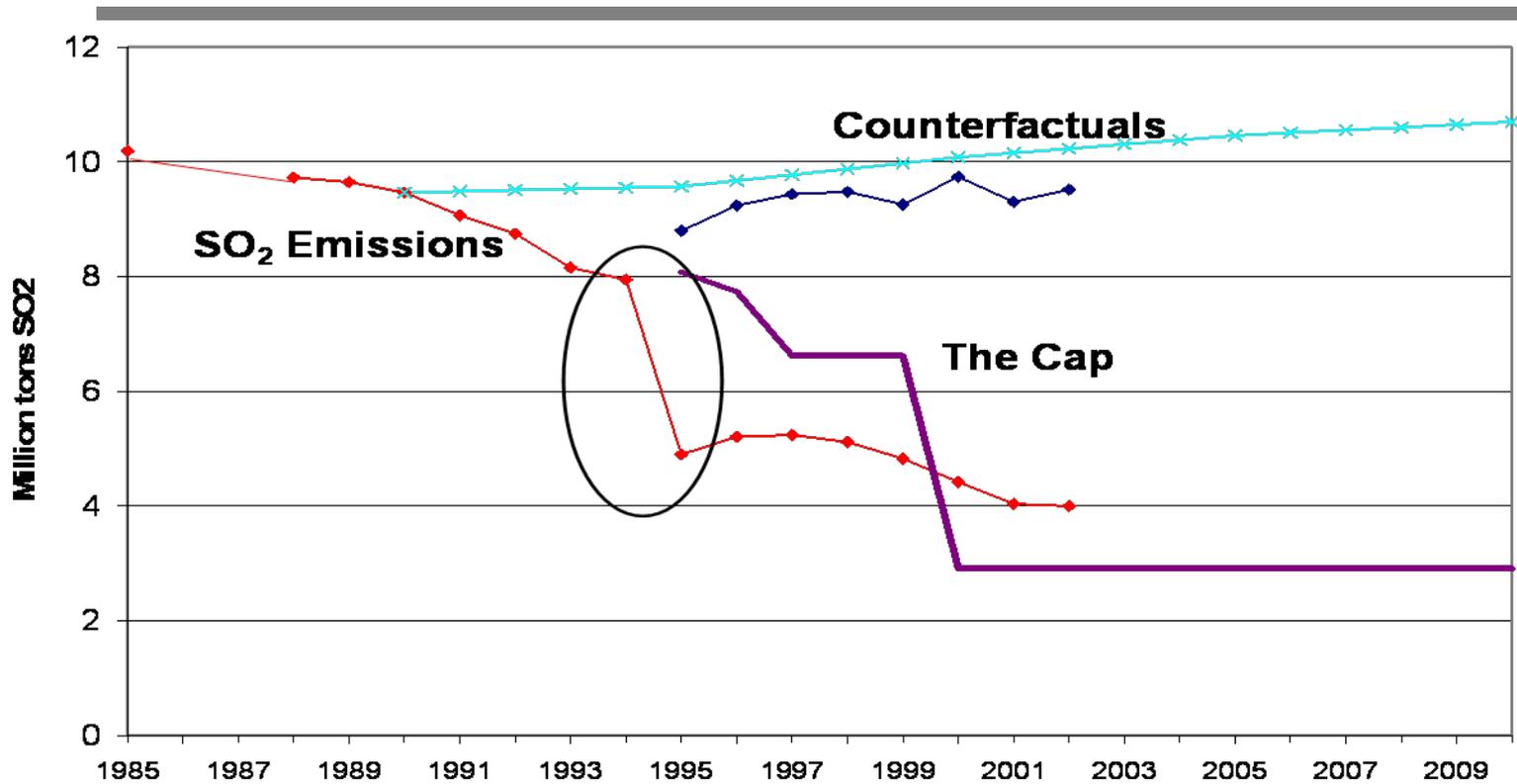
# Some History (2)

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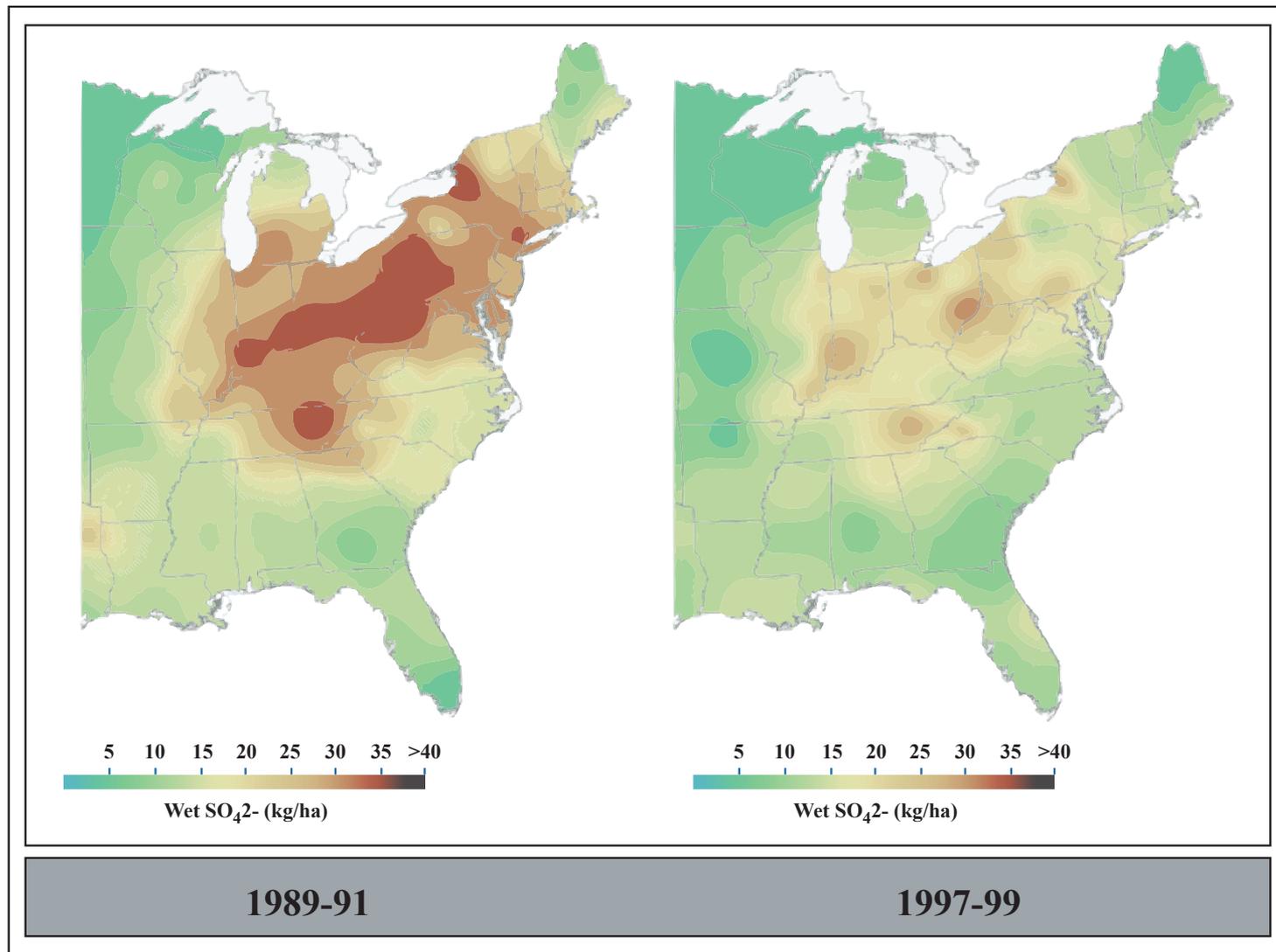
- OTC/NO<sub>x</sub> Budget Program (1999- )
    - Regional, mostly power plants
  - EU ETS (2005 - )
    - First CO<sub>2</sub> and multi-national system
    - Largest cap-and-trade market and program
  - Kyoto Protocol (2008 - )
    - Government trading; essentially voluntary
  - Regional Greenhouse Gas Initiative (2009 - )
    - 1<sup>st</sup> mandatory US program; very low prices
- 



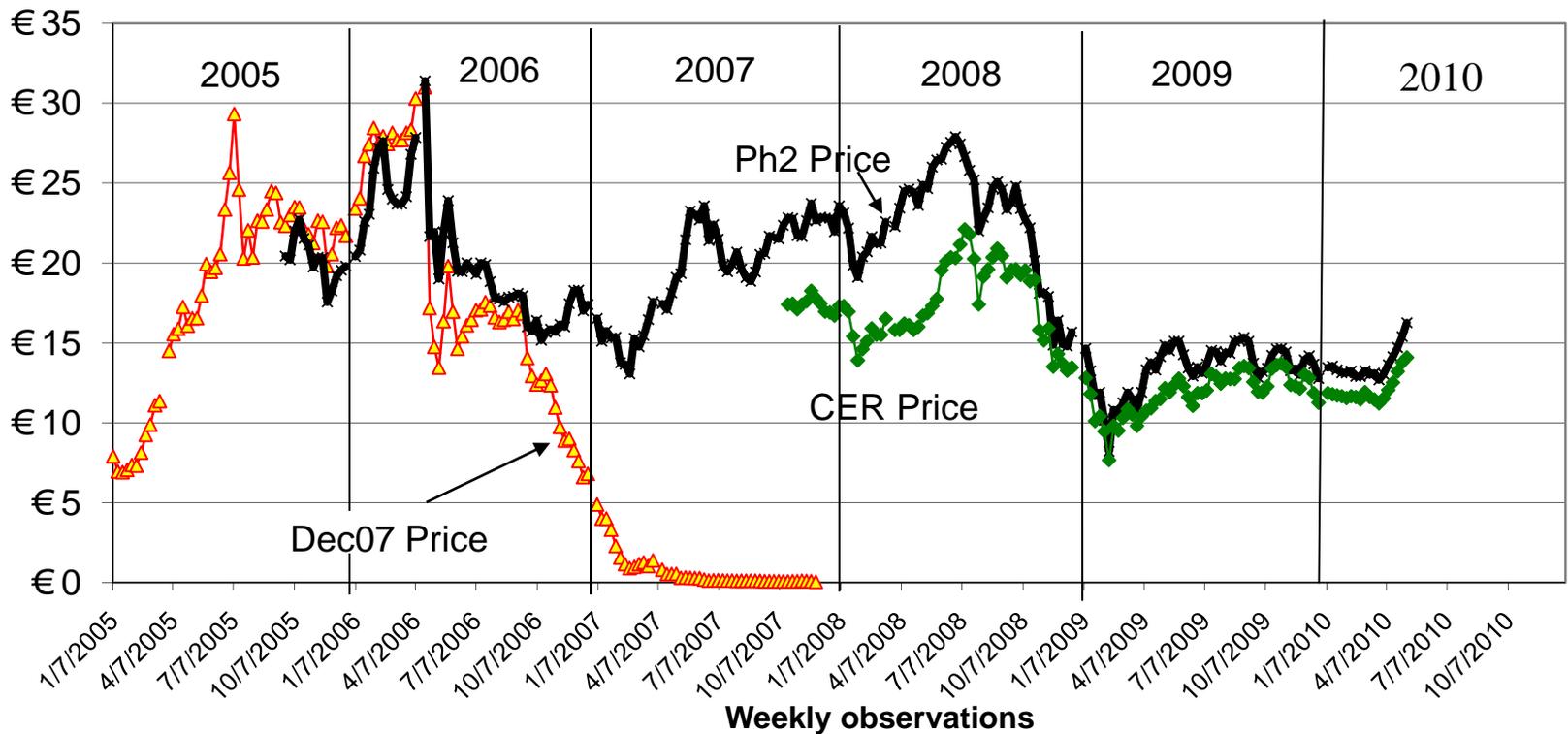
# Why the SO<sub>2</sub> Program was Successful



# Monitored reduction in wet sulfate deposition due to Acid Rain Program



# CO<sub>2</sub> Prices in the EU ETS



# What have we learned?

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- More effective and lower cost than conventional regulation
  - Firms do respond to prices
- Many new, unexpected ways to reduce emissions
  - Many more ways than could be mandated
  - No favored approaches/technologies
- Cheapest reductions tend to where there are the most emissions: “Dirtier is cheaper”
  - A matter of amortizing fixed costs: Paid by the ton



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