Market Mechanisms to Curb Greenhouse Gases: Challenges and Future Directions

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Overview

- Taxes vs. cap and trade
- The evolution of cap and trade from SO_2 to greenhouse gases
- New cap and trade programs in Europe and states
- Conclusions

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Emissions Trading

- Set a target or cap
- Distribute tradable permits (allowances) to industry
- Companies choose emission reduction strategies and may trade allowances
- Government measures emissions and assesses penalties if emissions exceed allowances
- Cap provides certainty that a quantity of emissions will not be exceeded but leaves uncertainty about price

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Taxes

- Set a price for carbon or carbon dioxide
- Measure emissions (or fuel use) and collect fee
- Creates certainty about price of policy (but not quantity of emissions)
- What about the revenues?

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Lessons from SO_2 for GHG

- General lessons:
  - Emissions trading is an effective instrument
  - May be even more appropriate for ghgs because no “hotspots”
- Specific elements:
  - Hands-off role of regulators
  - Flexibility of timing important (banking)
  - Importance of monitoring and verification
  - Political importance of allowance distribution

What might be different in a ghg system?

- Scope and point of regulation
- Higher stakes for distribution of allowances: auction vs. free allocation
- Mechanisms to limit price uncertainty (safety valve)
- Additional incentives for R&D, technology deployment
- Global dimensions of problem

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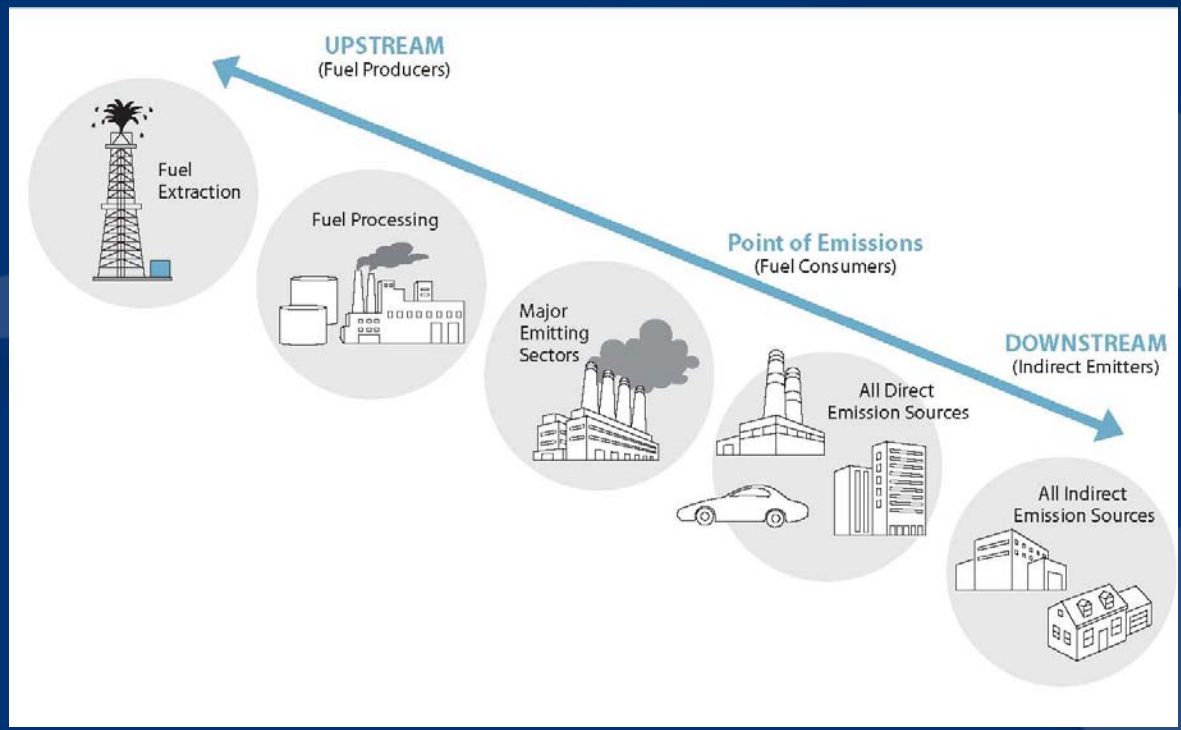
Scope & Point of Regulation



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High stakes for allowance distribution

- Huge asset value of allowances
- In a competitive market, "opportunity cost" of free allowances passed on
  - Special issues for power sector; competitive markets vs cost of service regulation
- How much compensation is needed?
- Allocation need not be tied to point of regulation

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Mitigating Price Uncertainty

- Climate change is a long-term problem
- Fuel markets and other factors can cause price uncertainty/spikes
- Price uncertainty makes long-term technology investment difficult
- Safety valve mechanisms may improve political feasibility for first mandatory step
- But ultimately we will need transition from price certainty to emissions certainty

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Additional incentives for R&D, technology deployment

- In the short-term, technologies not available to make the ecologically necessary reductions (e.g., carbon capture and storage)
- Is it possible to incentivize by the carbon price alone?
- Most legislative proposals provide additional incentives for R&D, technology deployment

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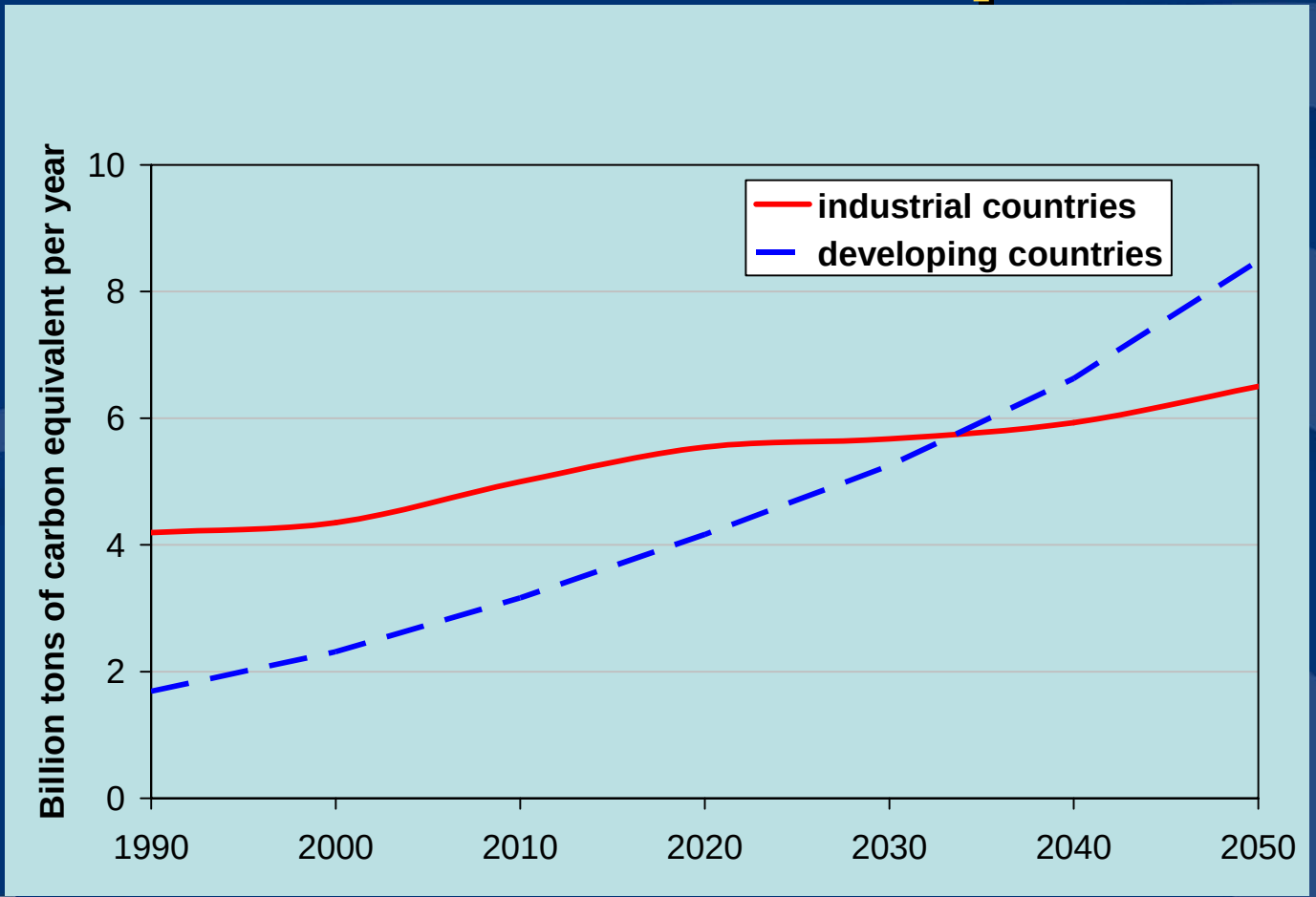
Global dimension of problem



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Summary of the EU Trading System

- **Participants:** 25 Member States (MS)
- **Timing:** Periods are 2005-2007 and 2008-2012
- **Coverage:**
  - **Sectors:** Energy activities (including electric power), iron & steel, minerals, pulp and paper
  - ~12,000 installations covering 46% of CO_2 emissions
- **Links to Kyoto mechanisms**

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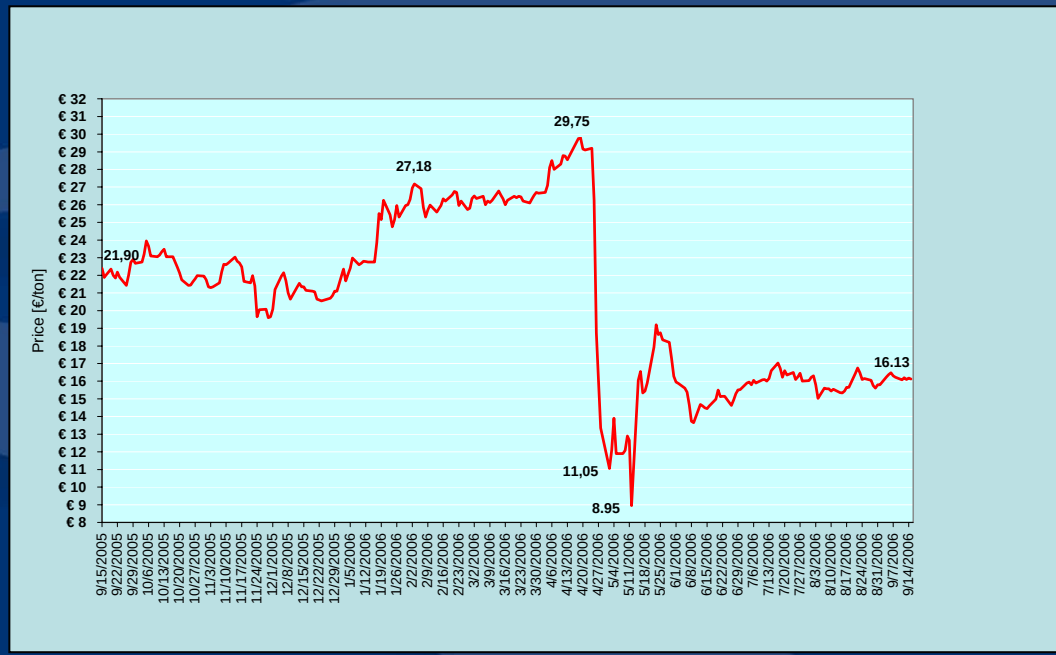
EU Market

- Active trading
  - $9 billion in transactions in 2005
  - $19 billion in the first 9 months of 2006
- Volatility
  - Poor market information?
  - Fuel prices?
  - Too many allowances?
- New caps and allocations are under discussion for 2008-2012 period



EUA Spot Price [€/ton], September 2005 – September 2006

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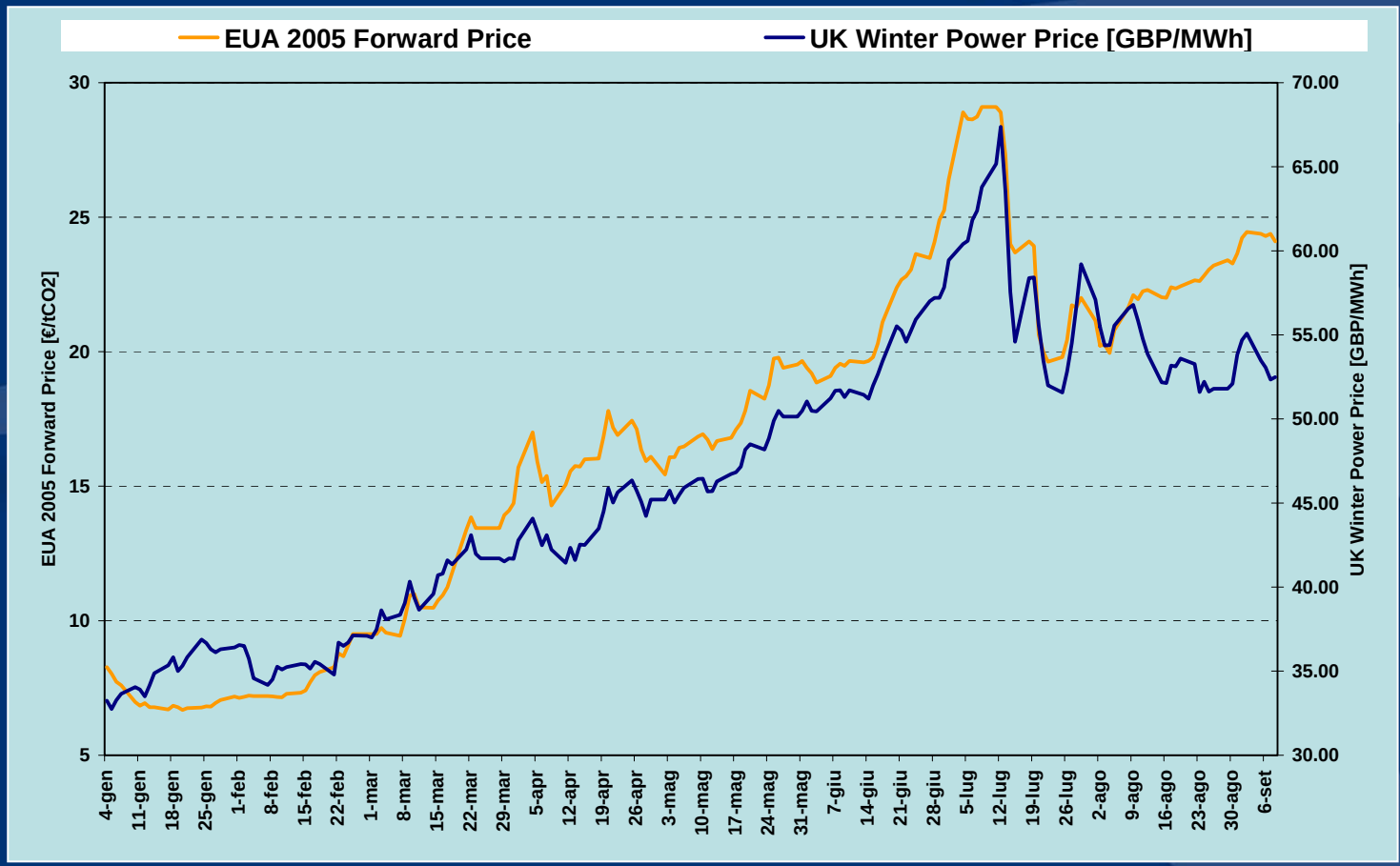
EUA & UK Power Prices



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Regional Greenhouse Gas Initiative (RGGI)

- Seven states signed MOU in December; three additional states to join
- Program covers power sector
- Cap at current levels by 2009; 10% reduction by 2019;
- At least 25% of allowances for “public benefit”

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California

- Economy-wide cap on emissions
  - 1990 emissions by 2020
  - Likely to include trading program in some sectors
  - Explornig links to RGGI, EU trading programs

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Conclusions/Predictions

- Trading programs are evolving to address climate change
- U.S. will benefit from the European and RGGI experiences
- Ultimately, we will have a mandatory program with
  - Economy-wide approach
  - A safety valve for price certainty
  - Less free allocation and a transition to auctions over time
  - Cap and trade increasingly seen as part of policy mix with technology policies/R&D
  - Strengthening of cap will be tied to actions by trade partners (e.g., China)

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