Auctions in RGGI and in the US Electricity Sector

Dallas Burtraw
Resources for the Future

EU ETS Auction Workshop
Cambridge, January 12, 2007

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- RGGI public benefit allocation
- NY, NJ
- End-use investments
- July 06 Workshop
- Road Map

- Note intended use of revenues

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

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Auctions and Auctioneering: Public Policy Applications

Charles Holt, University of Virginia

- Auctions can bypass wasteful rent-seeking
- Auctions create real economic value by finding the high-value users
- Auctions promote price discovery by bringing together all buyers and releasing significant quantities
- Auctions are fast, fair, and generate high revenue when properly designed
- Emissions allowances are relatively homogeneous, so auctions should be simpler to design. Holt would suggest looking at clock auctions as strong candidates for generating fast, efficient, and high-revenue outcomes, i.e. maximum public benefit.

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Road Map

- *Articulate the goals of the allowance auction.*
- *Identify basic auction designs that are consistent with goals.*
- *Identify a range of relevant auction parameters.*
- *Solicit input from stakeholders and independent experts.*
- *Develop a short list of potentially appropriate designs.*
- *Test auction designs with laboratory experiments.*
- *Develop proposed auction rules.*
- *Take care with set-asides and preferential allocation.*

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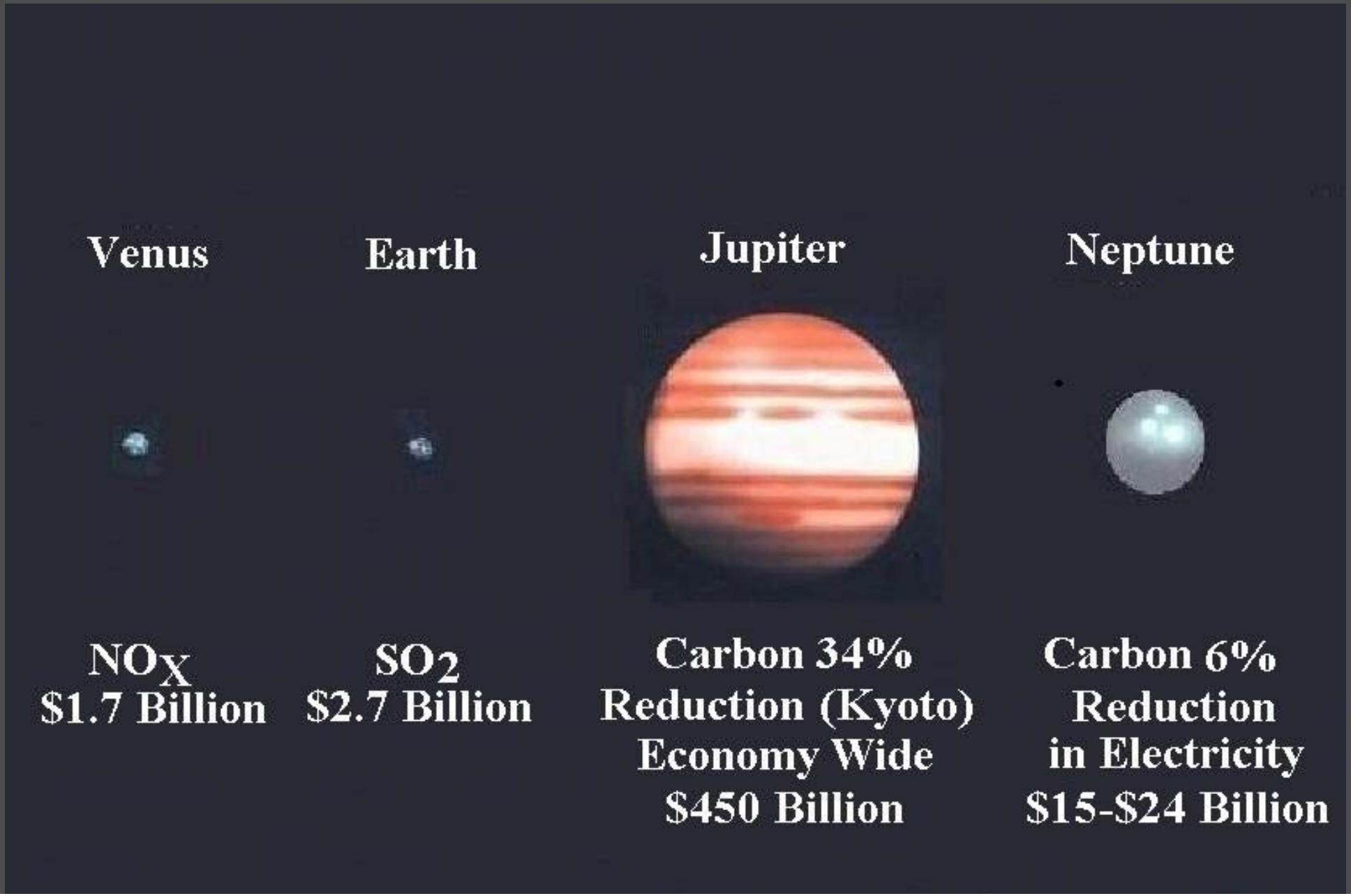
Annual Asset Value of Emission Allowances



Compensation

Key assumption: Long-run costs to shareholders accrue only in competitive regions.

- Consumers realize greatest loss, but harm is diffuse.
- Measure of "deserved" compensation for producers depends on the *yard-stick*.
  - Industry-level cost is $1/8^{th}$ of allowance value in competitive regions ($1/16^{th}$ nationally).
  - At firm-level, a revelation strategy invoking complete information/precise policy could achieve *full compensation* for **22%** of allowance value, creating $8 billion for winners.

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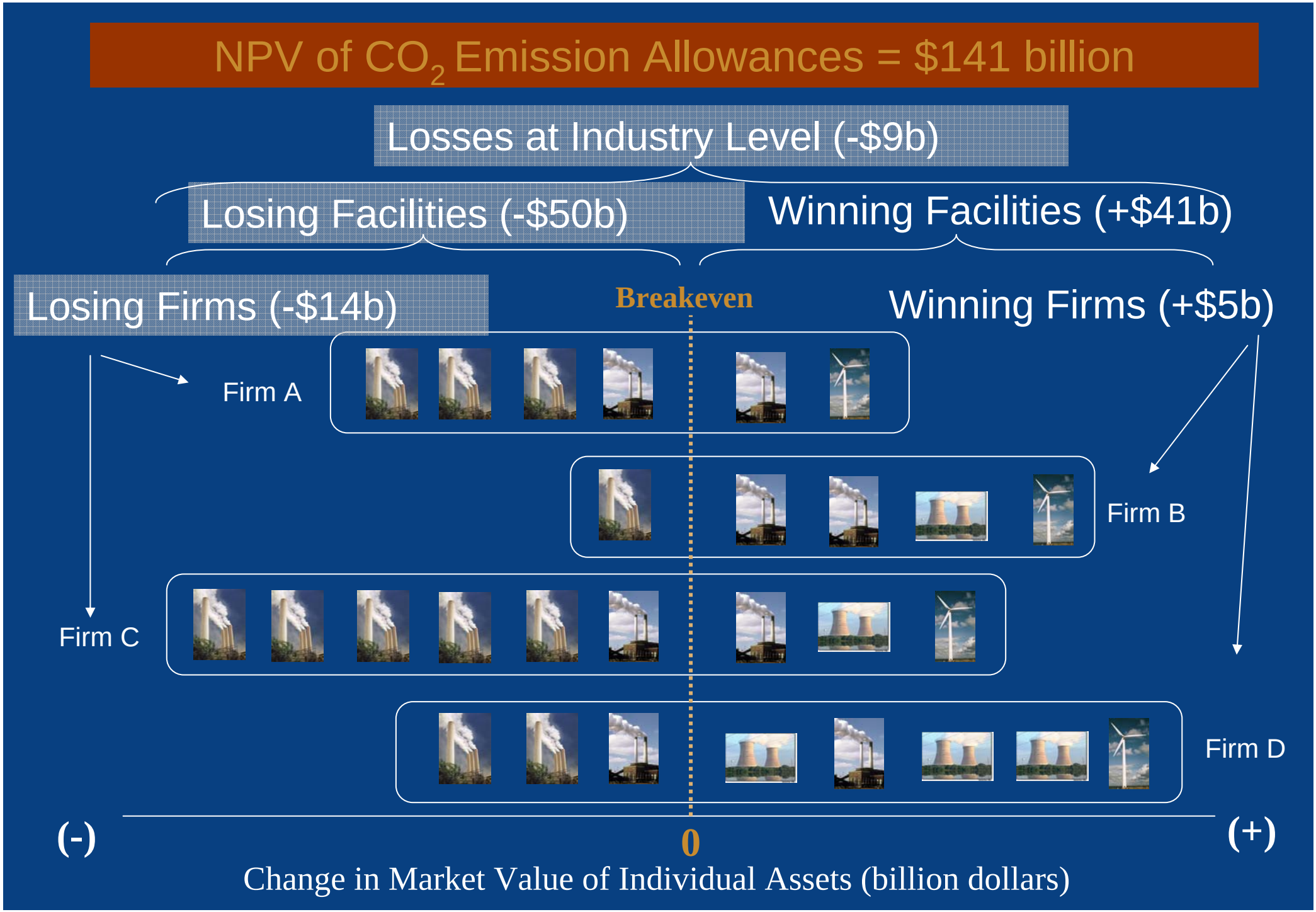
NPV of CO_2 Emission Allowances = $141 billion
Losses at Industry Level (-$9b)
Losing Facilities (-$50b)
Winning Facilities (+$41b)
Losing Firms (-$14b)
Breakeven
Winning Firms (+$5b)
Firm A
Firm B
Firm C
Firm D
(-)
0
(+)
Change in Market Value of Individual Assets (billion dollars)

Compensation (2)

Compensation has a significant opportunity cost.

- Free allocation (100%) provides over-compensation of $65 billion (1999$).
- With information about fuel & technology characteristics a (smart) blunt policy can achieve the goal for **39%** of allowance value, with overcompensation of $19.5 billion.
- With information about firm-level emission rates a (smart) blunt policy can achieve the goal for **32%** of allowance value, with overcompensation of $15 billion.
- The incremental opportunity cost of compensating for the last $2.6 billion is $26 billion at the federal level.

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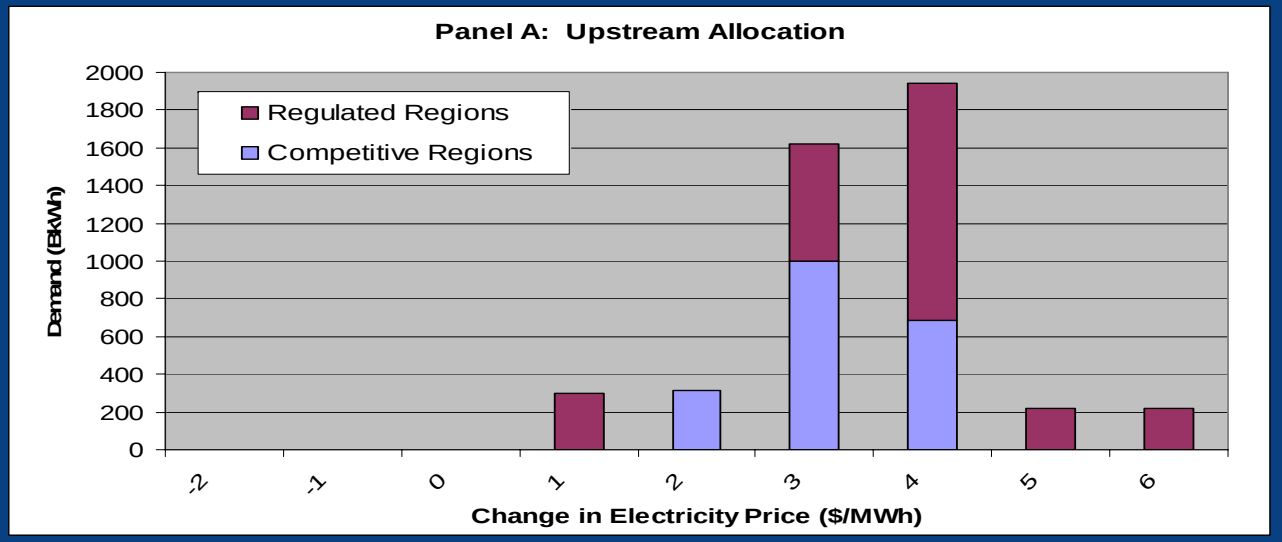
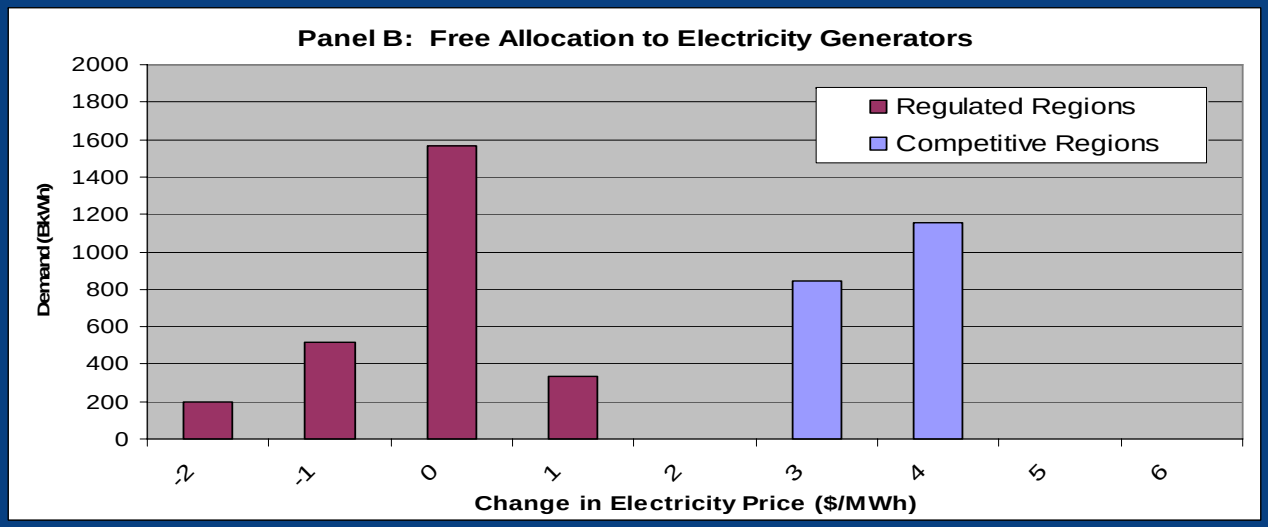
Electricity Price Effects of Allowance Allocation Depends on Electricity Regulation





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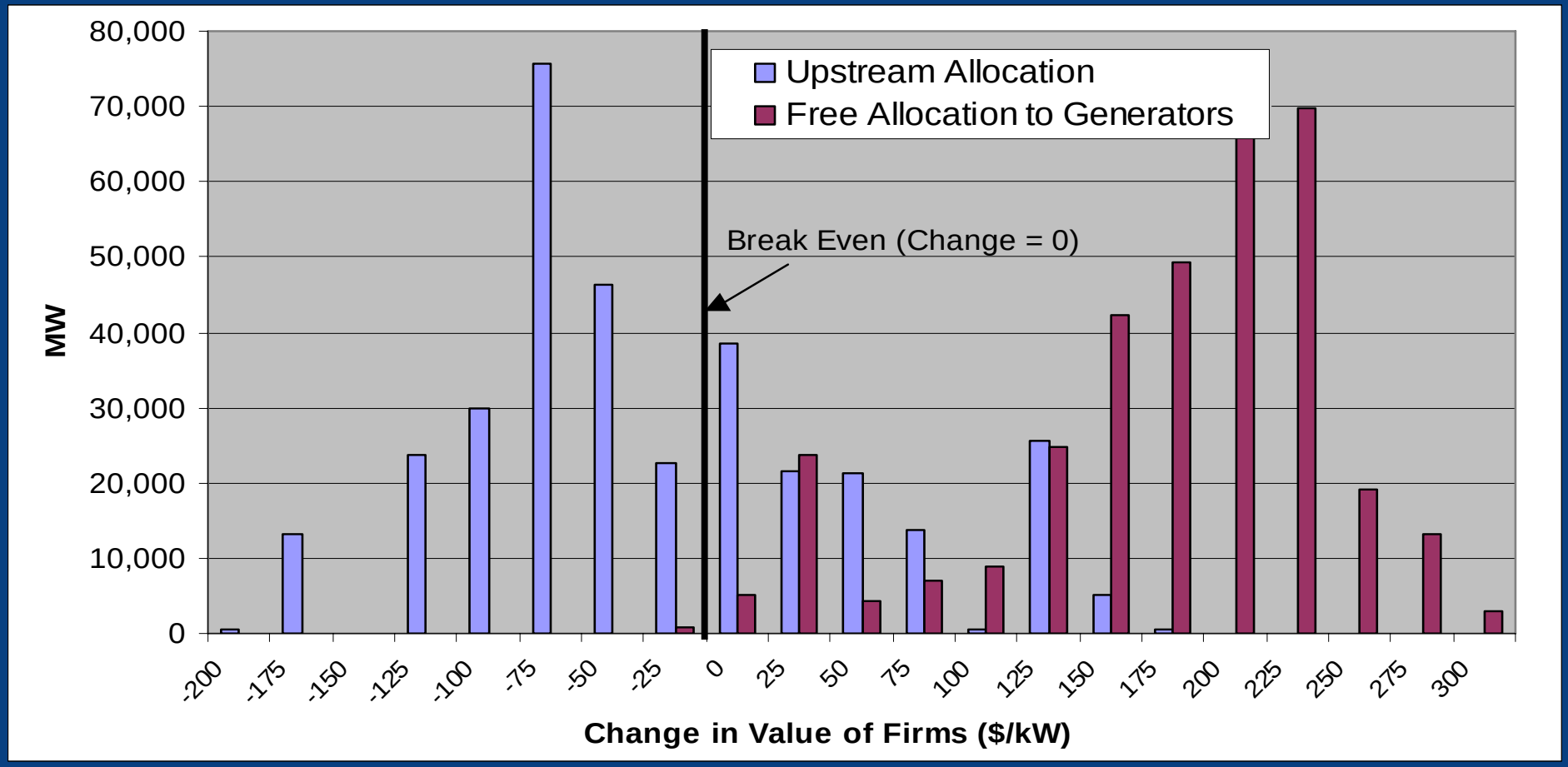
Distribution of Costs to Firms in Competitive Regions Under NCEP/Bingaman National Proposal



National Commission on Energy Policy

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Safety Valve Policies

- Fixed targets (quantities or prices) cannot respond to new information.
- An inherent attribute of market based policy is instantaneous feedback on marginal cost (allowance price).
- **Safety valve** instruments embody ***decision rules*** to respond to market information about costs.

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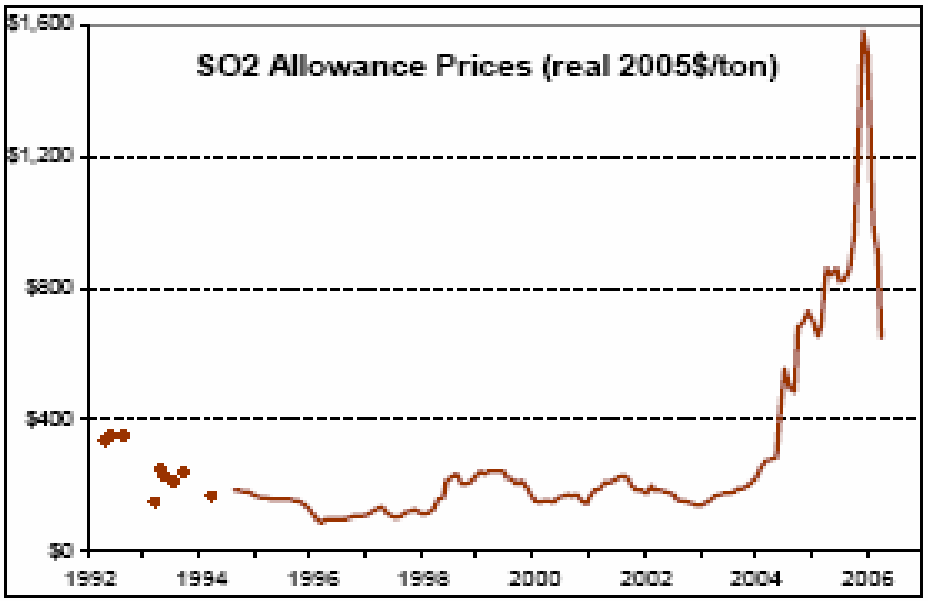
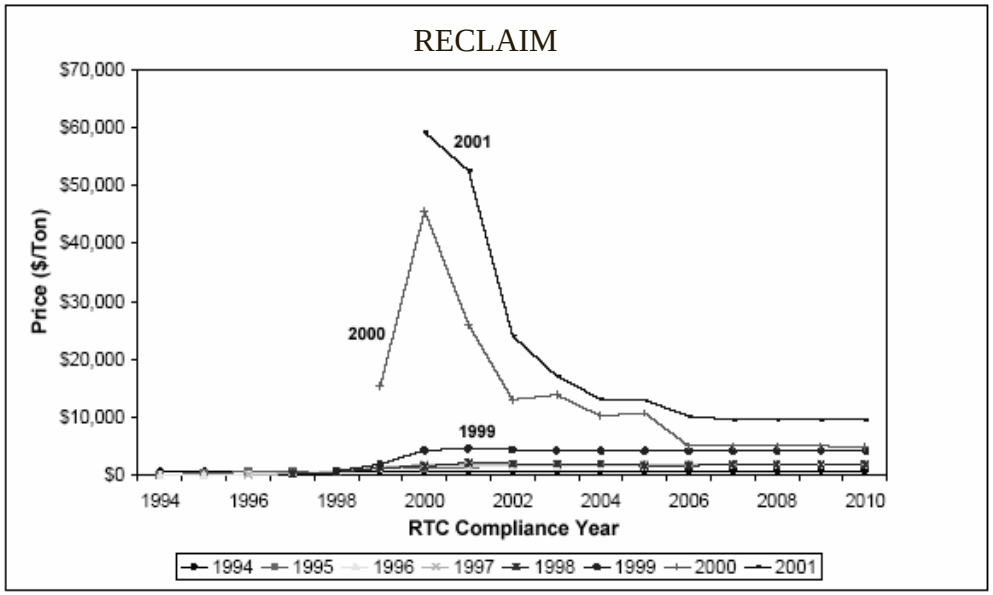
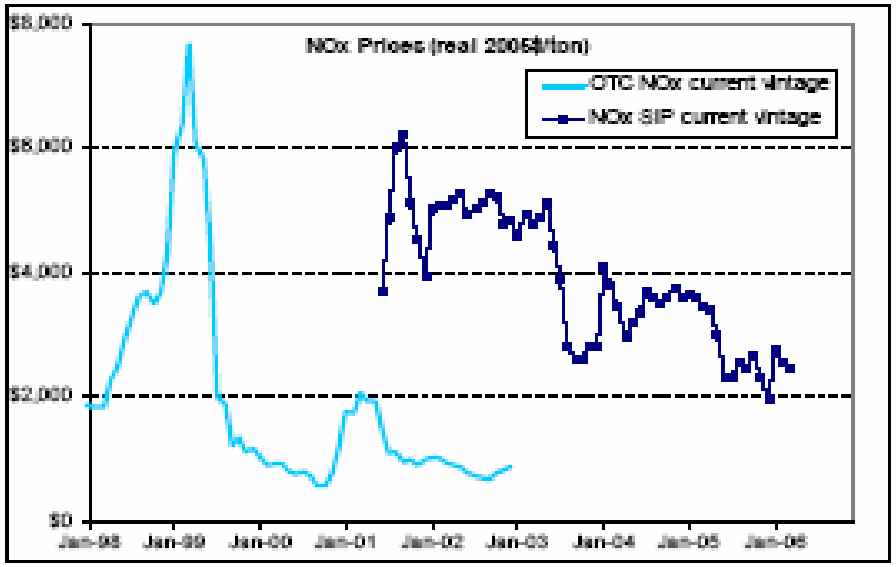
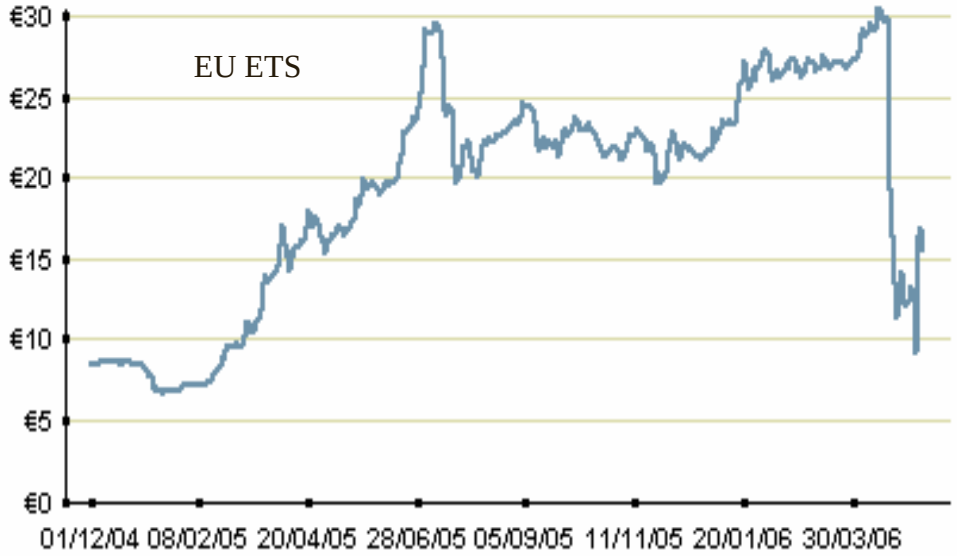
Volatility in Emission Markets





Source: South Coast Air Quality Management District (2002a).





Economic Impact of Price Volatility Based on Experience To Date

- Unexpected price rise – **RECLAIM**.
- Unexpected price fall has been much more important in economic terms - **SO_2**
  - Benefits of the Title IV SO_2 program appear to be 30-50 greater than costs.
  - Imagine safety valve 33% below mean of EPA (1990) cost forecasts.
  - In 2010 (absent CAIR) emission reductions of over 2 million tons (Banzhaf et al.).
  - ➢ Imposing a floor on SO_2 allowance prices under Title IV would have improved economic welfare by $1.5 billion to $8.25 billion per year.

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Why the Symmetric Safety Valve is Important

A one-sided safety valve has unintended consequences

- One-sided safety valve reduces risk of unexpected impacts on the economy. But…
- It breaks the emission cap
- Reduces incentive for innovation.
  - The upside profit potential for investors in clean technology is lower.
  - Thus, the one-sided safety valve lowers the investor's expected future profits.

A symmetric safety valve

- Adding a floor on allowance prices offsets these unintended consequences and improve welfare, efficiency.

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Taylor Series Approximations of Equilibrium Measures