

# Symmetric Cost Management for Cap and Trade to Improve Efficiency and Performance

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Greenhouse Gas Trading Program

# A Policy for Addressing Uncertainty

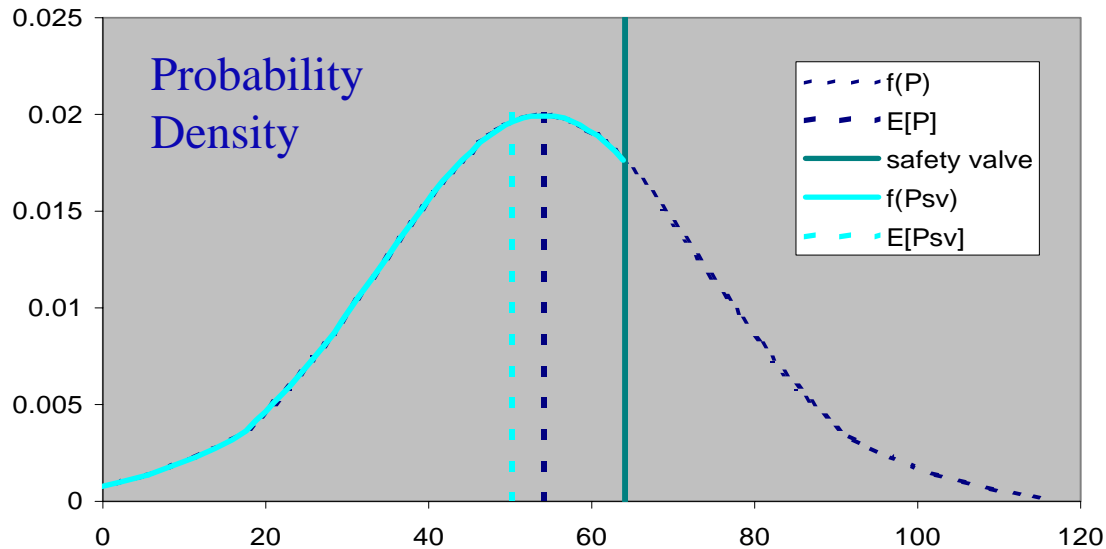
- Fixed targets (quantities or prices) cannot respond to new information.
- An inherent attribute of market based policy is instantaneous feedback on marginal cost (through the allowance price).
- Discretionary approach provides flexibility but less certainty, could disrupt markets.
- Policy can embody *decision rules* to respond to market information about costs.

# Environmental Criticisms of a Safety Valve Have Merit

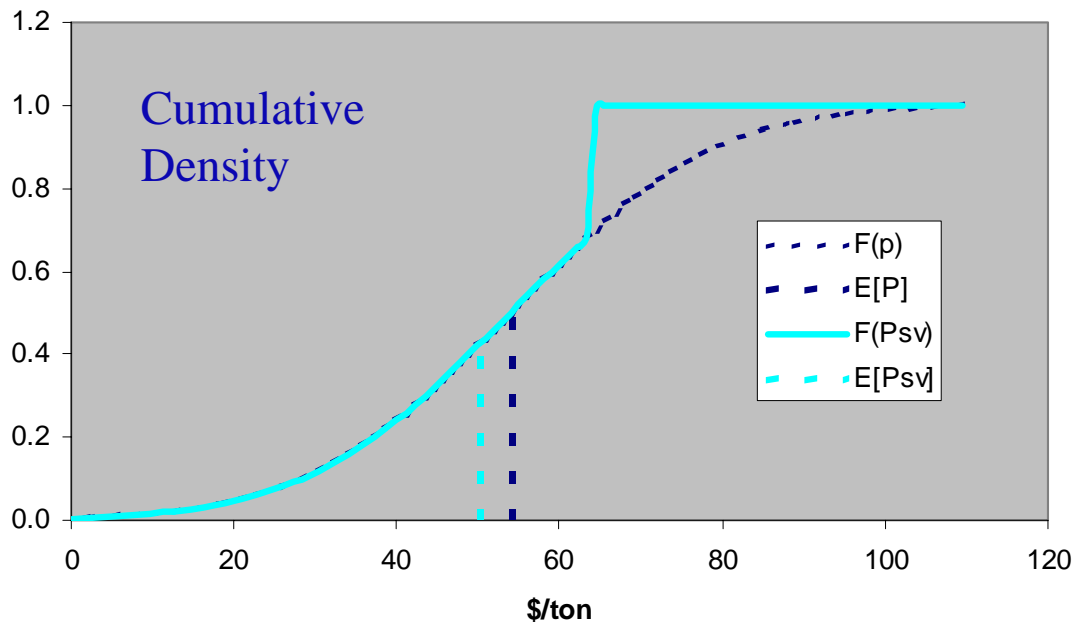
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1. SV lowers expected payoff for innovators.

# Interpretation of Safety Valve



The one-sided safety valve truncates potential high allowance price values and shifts the expected value to the left.



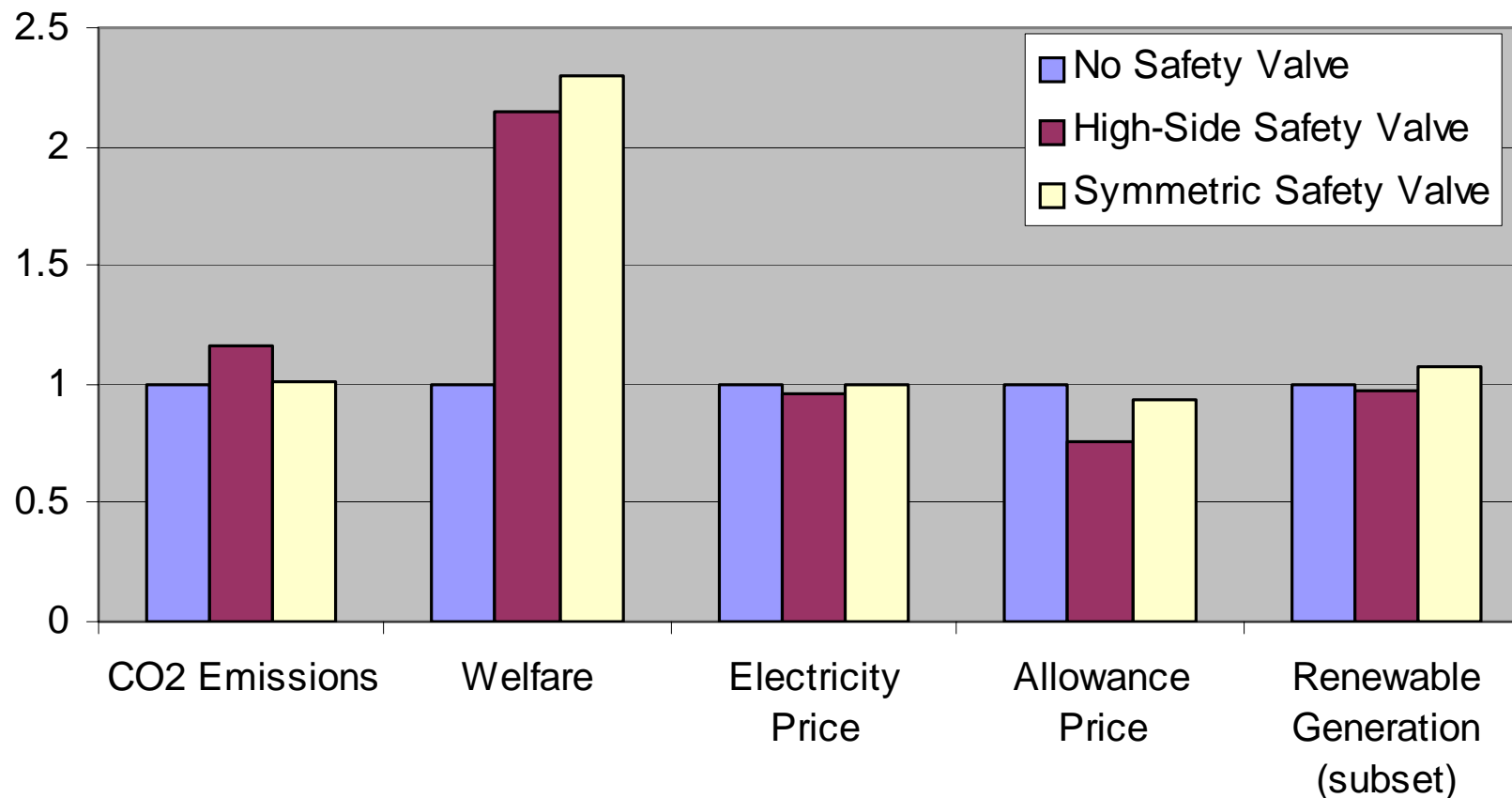
Subsequently, a change in expectations leads to a new equilibrium.

# Environmental Advocates' Criticisms of a Safety Valve Have Merit

1. SV lowers expected payoff for innovators.
2. SV increases expected emissions.

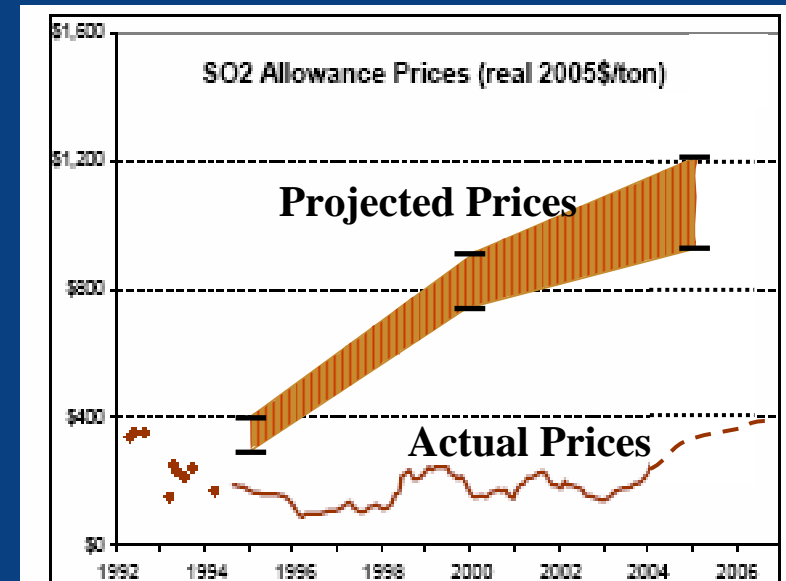
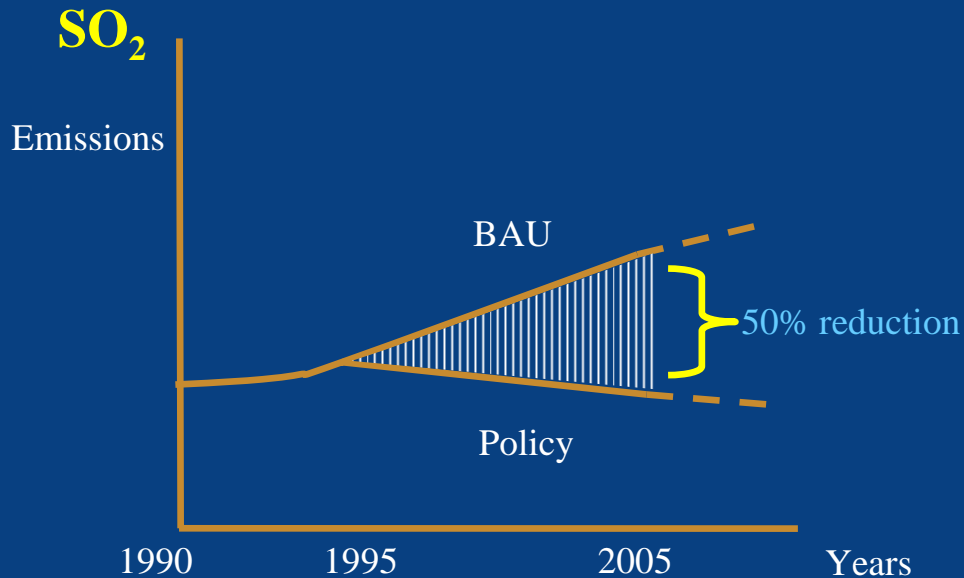
*Example: Natural Gas Price Uncertainty*  
Taylor Series Approximations of Equilibrium Measures  
**Symmetric Cost Management Recovers Environmental  
Performance, Improves Welfare**

**Expected Values of Key Variables Compared to  
No Safety Valve Policy in 2020**



# What to expect in new uncharted territory?

Potential price spikes have motivated the discussion of cost containment...



- But the most important experience we have has been for SO<sub>2</sub> ...produced an unexpected price fall.

# Economic Impact Based on Experience To Date

- Unexpected SO<sub>2</sub> price fall has been most important economically
  - EPA (1990) estimate for Phase II: \$742-\$974/ton (2005\$).
  - Imagine price floor 33% below mean, at \$575/ton.
    - ⇒ Absent CAIR, emission reductions over 2 million tons/yr. (Banzhaf et al.)
- Economic benefits of price floor
  - \$16 billion/year (using EPA estimates).
  - \$8.5 billion/year (using Banzhaf et al.)
  - Even using information available to congress in 1990, benefits are \$1.6-\$2.0 billion/year !
- These benefits were lost for over a decade until CAIR takes effect in 2010.

# How to implement?

- ◆ Early literature assumed free allocation.
- ◆ For CO<sub>2</sub> there will be an important auction component of allocation.
- ◆ Reserve price is a common feature of good auction design.
  - ❖ When the reserve price is not met in the auction a given lot of allowances will not be issued. The result will be maintenance of allowance price at or above the reserve price.

# Summary

- Market-based regulation is instantaneous information about marginal cost. To date, programs have not taken advantage of this information to help achieve policy objectives.
- Most important example to date: SO<sub>2</sub> allowance price floor would have improved economic welfare by \$1.6 - \$16 billions/year.
- One-sided SV increases welfare, but has unintended consequences.
- Symmetric cost management increases welfare further. It can
  - preserve the incentive for innovation and maintain the emissions target
  - guard against price volatility
  - and complement the design of an auction.