

Estimating Future Air Emissions Allowance Values

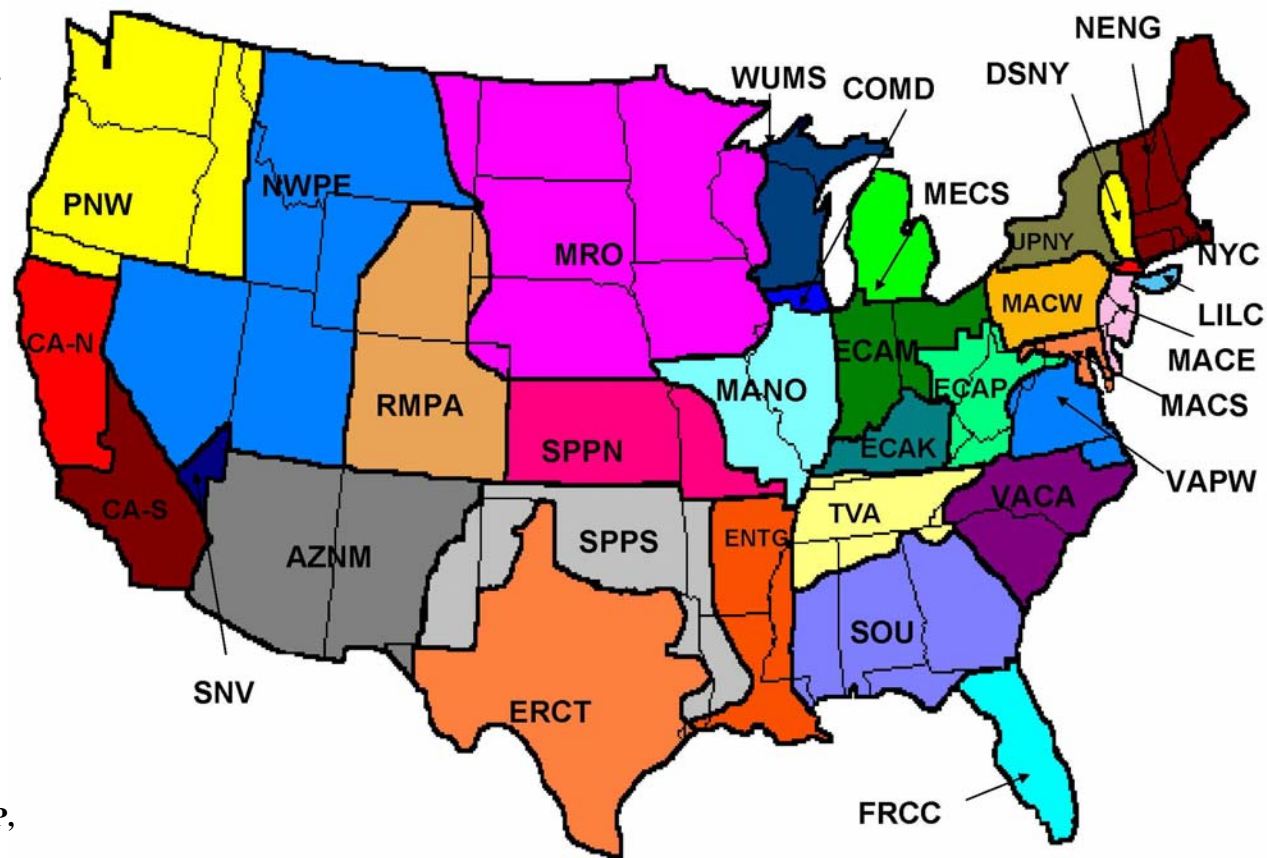
U.S. Environmental Protection Agency
Office of Air and Radiation

November 3, 2006



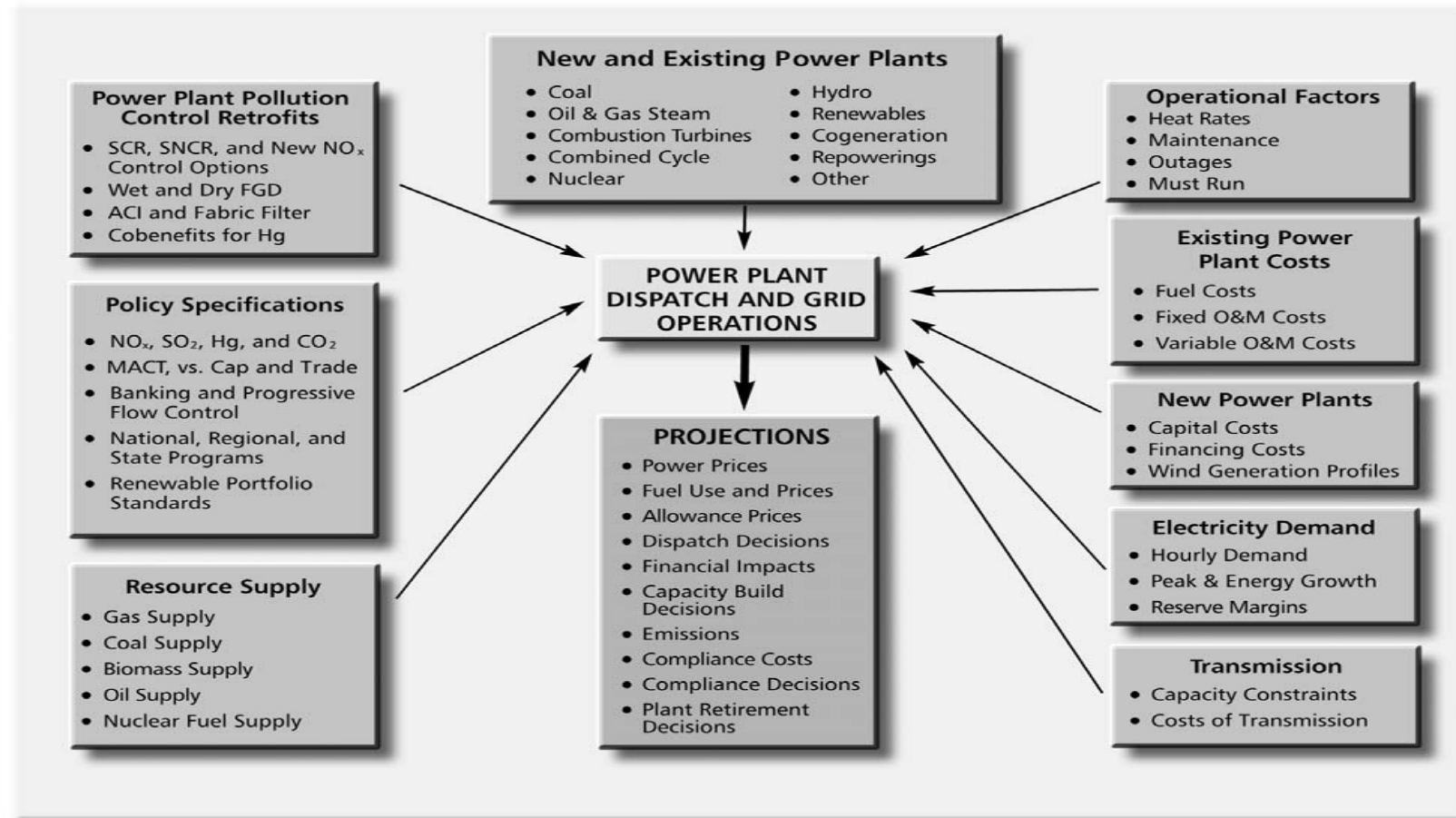
What Is IPM?

- IPM is a long-term capacity expansion and production costing model for analyzing the U.S. electric power sector
- EPA uses IPM to analyze emissions policies affecting the power sector
- IPM outputs are used in EPA's air quality models
- IPM was used on
 - CAIR
 - CAMR
 - CAVR
 - Clear Skies Initiative
- Other IPM users include
 - Government agencies (FERC, WRAP, OTC, OTAG)
 - Industry groups (EPRI, EEI, SoCal, PacifiCorp, TVA, AEP Florida Power, Cinergy, National Coal Association)
 - Other organizations (Center for Clean Air Policy, Clean Air Task Force, Clean Energy Group)

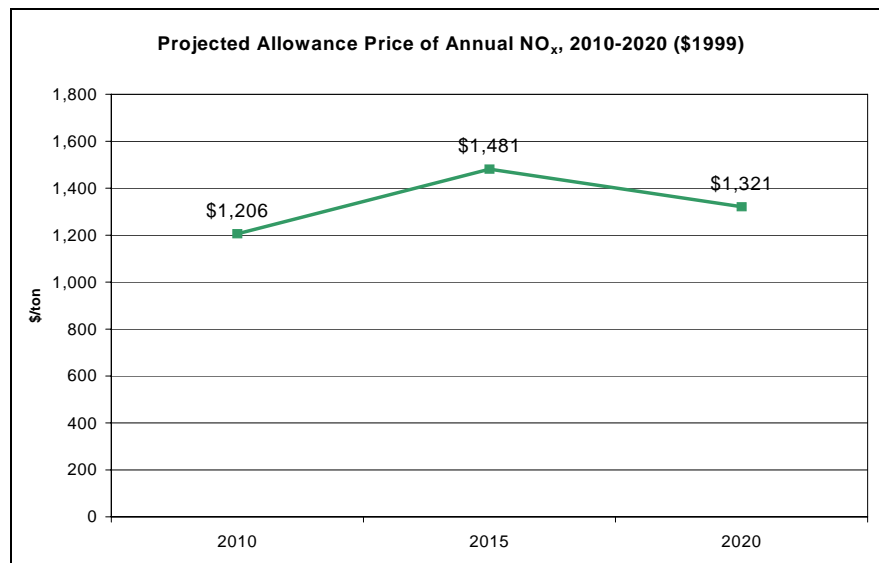
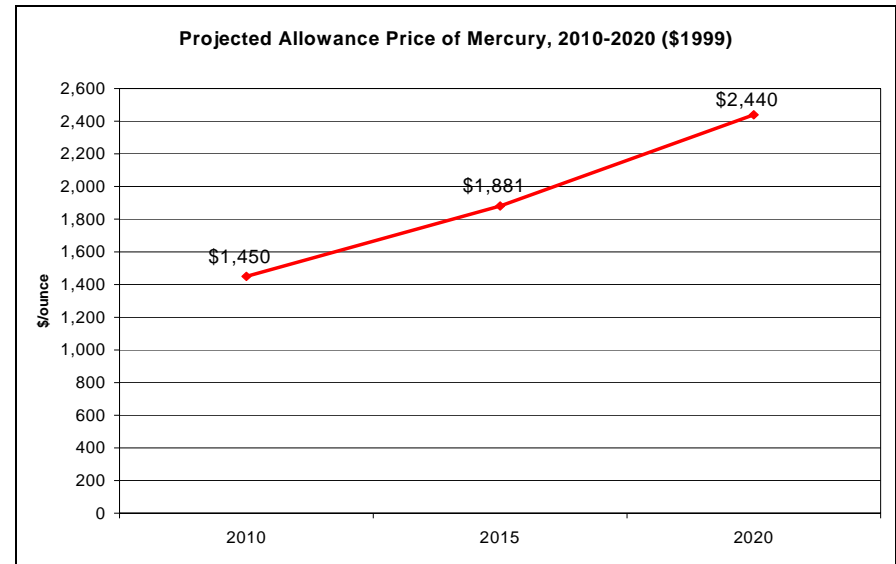
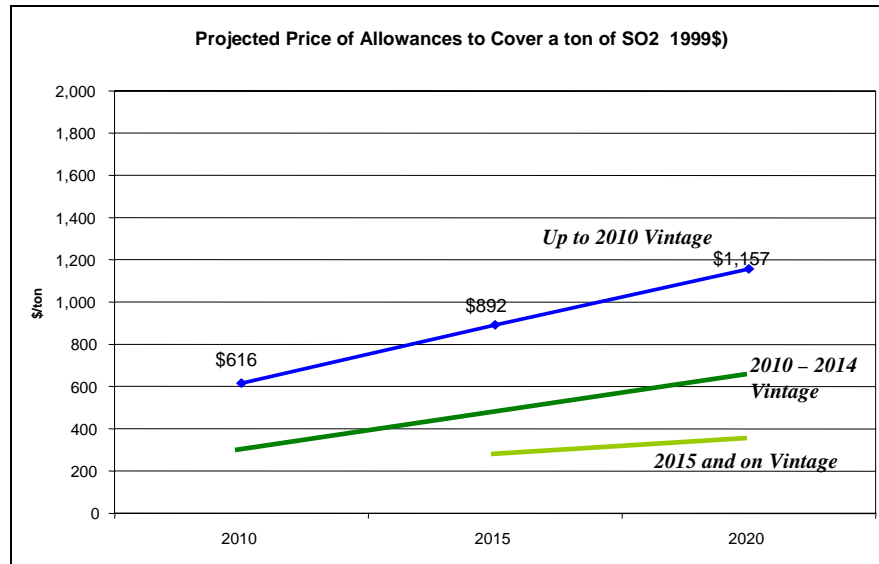


Model Regions in Recent Update of IPM

IPM Structure



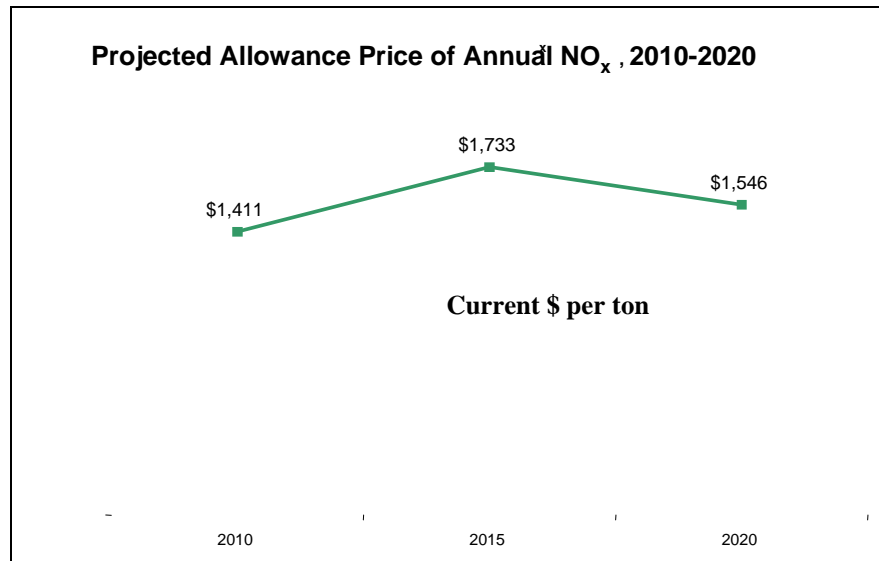
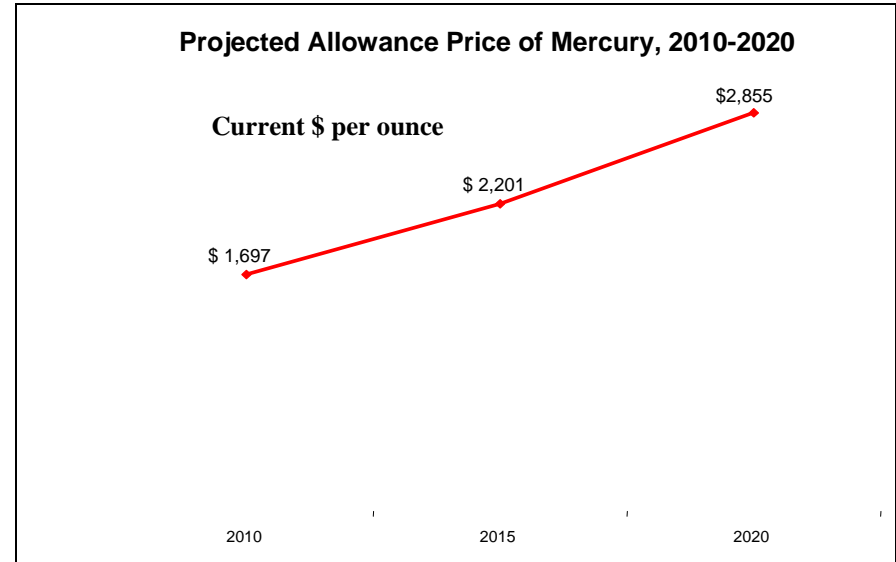
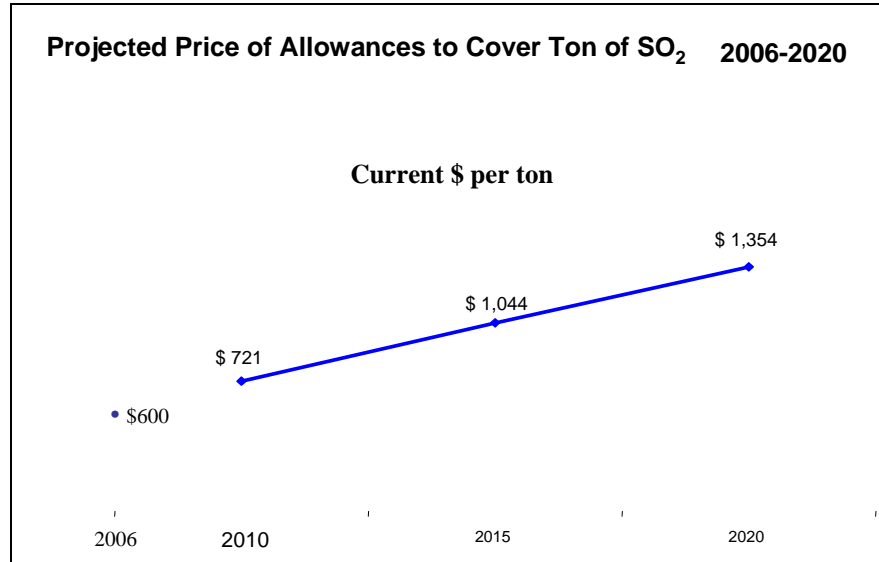
Projected Allowance Prices under CAIR/CAMR/CAVR



- 1999 \$
- Based on IPM's marginal costs or shadow price
- SO₂ price is for a **ton** of emissions that will be covered in CAIR by:
 - 1 Title IV allowance for vintages before 2010
 - 2 Title IV allowances for vintages 2010-2014
 - 2.86 Title IV allowances for 2015 and on...
- NO_x price is an allowance for a ton of emissions
- Mercury price is an allowance covering an ounce

EPA IPM Results from Fall 2005

Allowance Price Estimates in Current (2006) Dollars



- For SO₂, there is an estimate of what EPA's analysis suggests the 2006 allowance prices be given its future value beginning in 2010

EPA IPM Results from Fall 2005

Historically Overestimated Allowance Values in New Markets

Acid Rain Trading (SO₂)

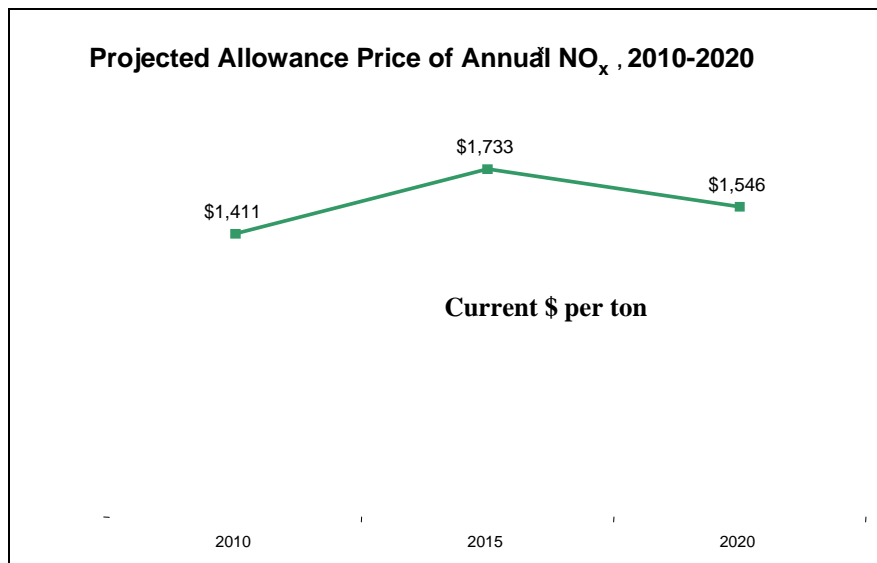
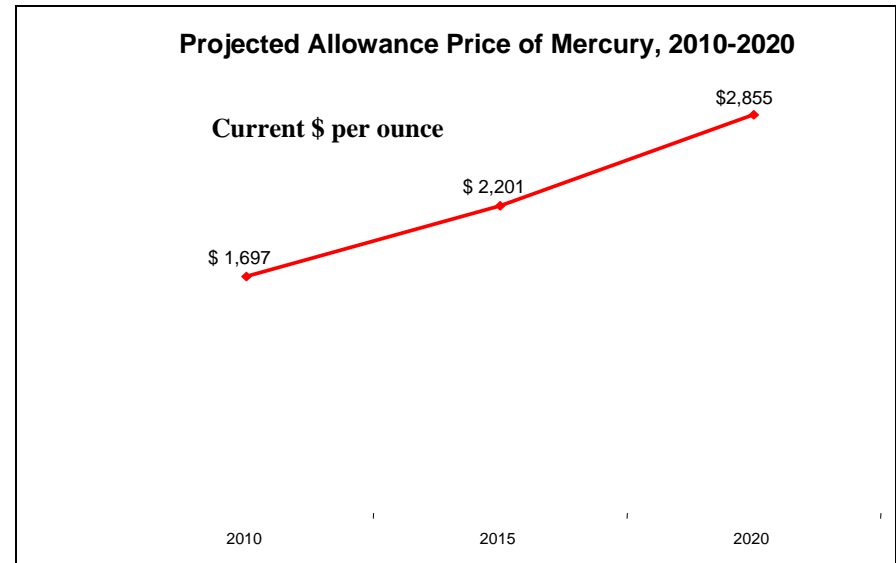
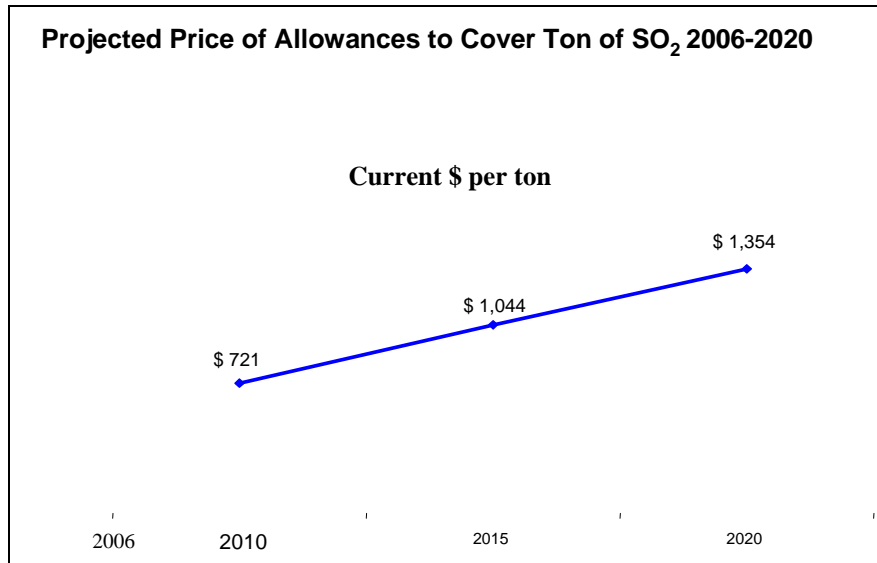
- In 1990, EPA did not foresee:
 - Shifting so cheaply and readily by industry to lower sulfur coals
 - Decreasing rate of electric demand growth
 - Falling natural gas prices

NO_x Budget Program

- In 1998, EPA did not foresee:
 - Operating low NO_x burners and SCR so effectively
 - Improving nuclear power operations
 - Having Court decision to “short ozone season” initially
 - Finding relatively lower NO_x emissions from industrial sources

...However, we may have been “the least wrong” ...

Uncertainty in Future Allowance Price Estimates



Factors that could move prices:

- Results of litigation which has uncertainty
- State actions. Recent survey indicates most states appear to be coming in for “CAIR-as-is”
- Relative fuel prices – natural gas to coal
- Re-emergence of nuclear power over time
- Unforeseen technological improvements or shortages for labor and material for pollution control
- Action to address climate change

EPA IPM Results from Fall 2005

To Learn More.....

Clean Air Interstate Rule

www.epa.gov/cleanairinterstaterule

Clean Air Mercury Rule

www.epa.gov/mercury

Clean Air Visibility

[Rulewww.epa.gov/visibility/actions.html#bart1](http://www.epa.gov/visibility/actions.html#bart1)

Multi-Pollutant Legislative Analysis

www.epa.gov/airmarkets/mp

www.epa.gov/airmarkets -- *click on* “News of Interest”