

General Aspects of U.S. Air Emissions Cap and Trade Programs

Presentation for
Centro de Estudios Públicos
by
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Office of Air and Radiation

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Cap and Trade Programs



Federal Programs


- Acid Rain Program (ARP)
- NO_x Budget Trading Program (NBP)
- Clean Air Interstate Rule (CAIR)
- Clean Air Mercury Rule (CAMR)
- *Clean Air Visibility Rule (CAVR)*
- *Clear Skies and Other Multi-Pollutant Legislation*

Other Programs

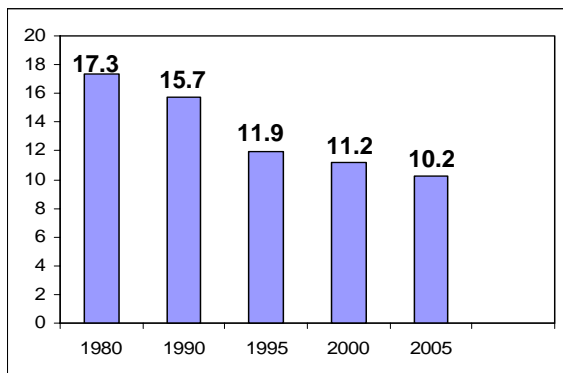
- Ozone Transport Commission
- Regional Clean Air Incentives Market (RECLAIM)
- Western Regional Air Partnership
- Chicago VOC Program
- Houston/Galveston Emission Allowance Program (NO_x)
- *RGGI*
- *EU Emissions Trading Scheme*



Basic Elements of Cap and Trade

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- **Air emission cap(s) are set for pollution sources in defined area**
 - **Allowances to emit are allocated to sources in amount not to exceed the cap**
 - **Sources must hold allowances to cover emissions**
 - **Tailored monitoring records source emissions**
 - **Programs rest on reasonable technical and analytic foundations**
 - **All emissions and allowance holdings are routinely recorded, reported and made publicly available**
 - **Sources can “trade” allowances and may “bank” them**
 - **There are automatic penalties and other enforcement sanctions**
 - **Assessment is conducted to see whether the program is working**

Results of Acid Rain Program: Major Reductions in SO₂ Emissions and Acid Rain



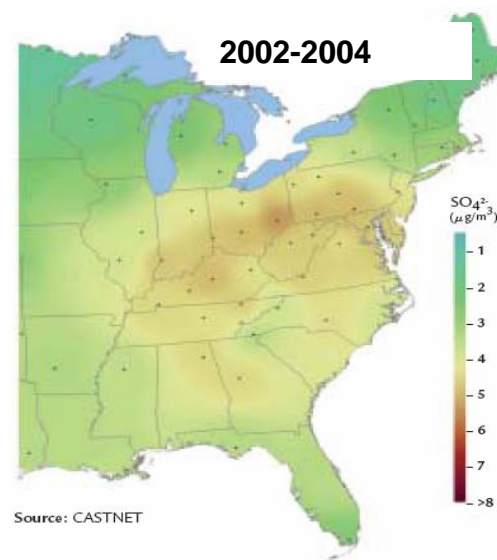
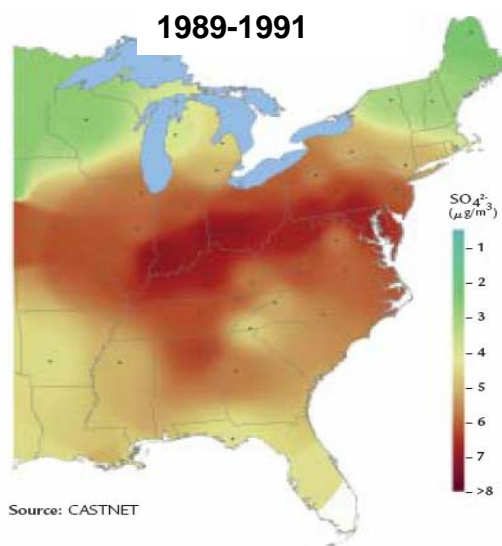
Million Tons of SO₂

SO₂ emissions from power plants down by 5.5 million tons since 1990



Acid rain cut by 25 – 40%

Sulfate
(Acid Rain)
Concentrations



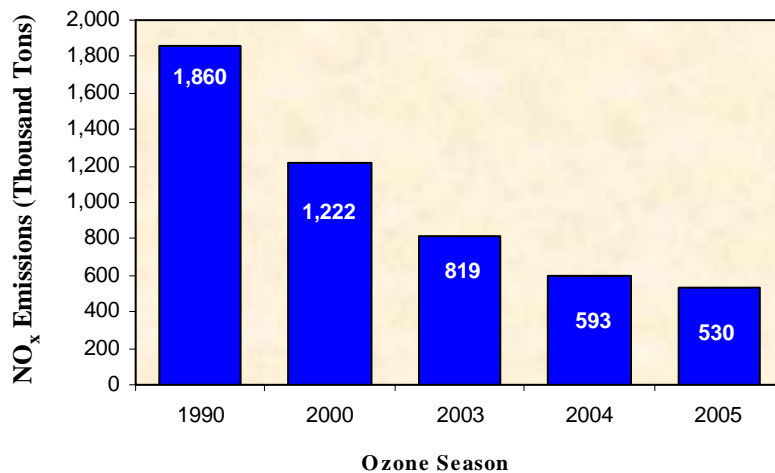
Substantial health, visibility, and other benefits provided

Summertime NO_x Emission Reductions

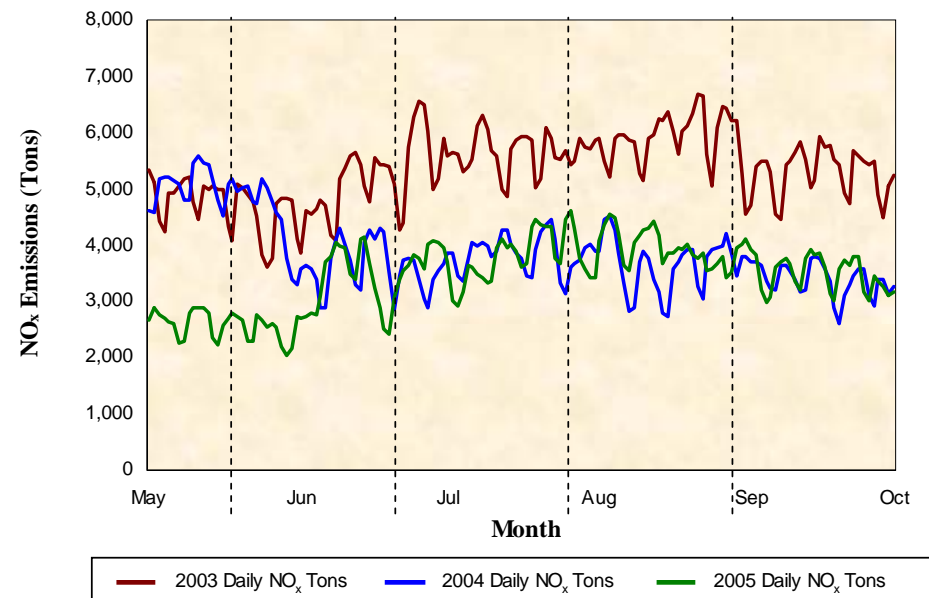
2005 NBP states' ozone season reductions (May 1 – September 30)

- ☹️ 72% from 1990 baseline
- ☹️ 57% from 2000 baseline
- ☹️ 11% from 2004

Total NBP Ozone Season NO_x Emissions




Daily Emission Trends for NO_x Budget Trading Program Units in 2003, 2004 and 2005



Source: EPA, 2006

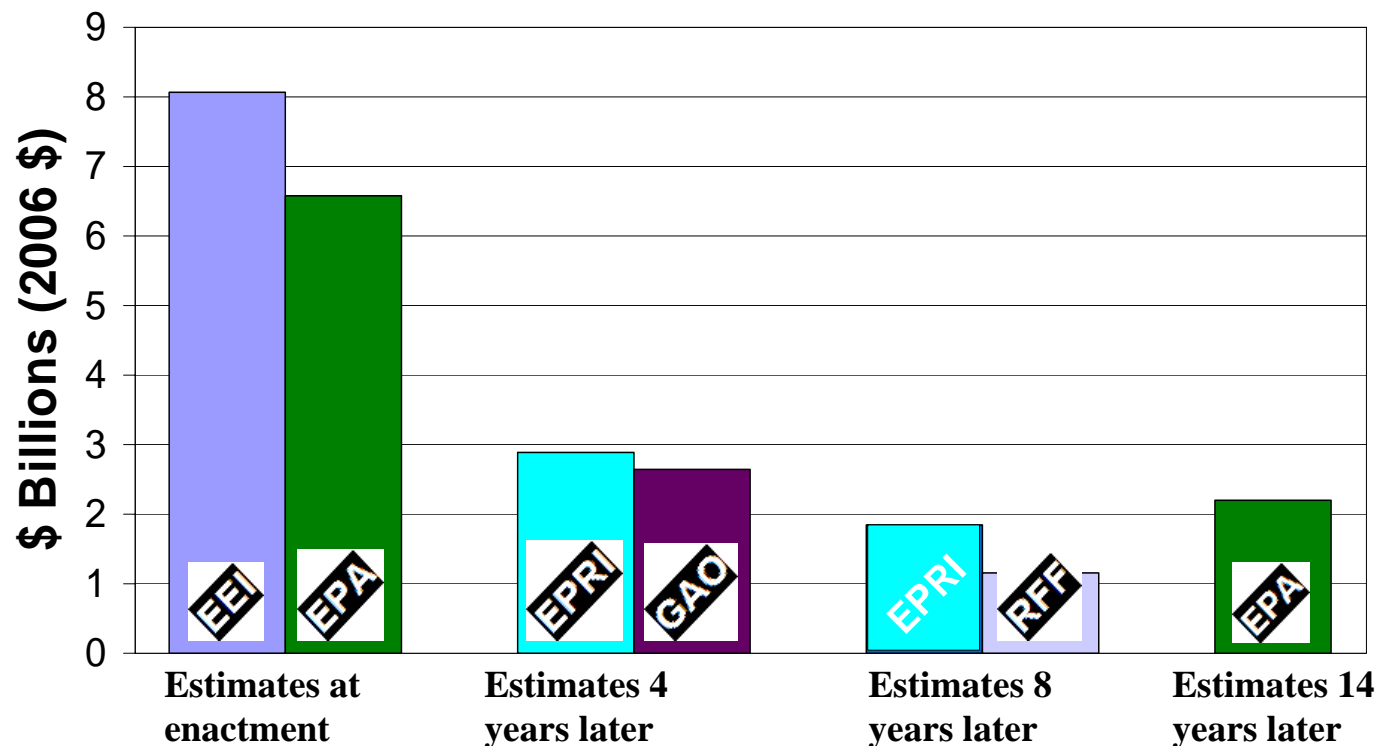


Major Features of Cap and Trade

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- **Certainty that a specific emission level will be achieved**
 - **Emissions measurement and reporting is emphasized for complete accountability**
 - **More regulatory certainty and compliance flexibility**
 - **Fewer administrative resources needed by industry and government (if kept simple)**
 - **Lower permitting and transaction costs for sources**
 - **Promotes innovation and early reductions with banking**
 - **Compatible with other mechanisms to ensure local protection**
 - **Lower costs – this also makes further improvements feasible**
 - **Need for formal enforcement procedures is minimized**

Acid Rain Program Costs: Much Lower than Originally Predicted

Acid Rain Program: Projected Annual Costs at Full Implementation in 2010




All estimates cover the SO₂ trading program and do not cover the NO_x program which EPA recently estimated annually cost about \$ 1.1 billion (in 2006 \$).

Source: EPA, 2006






Why Cap and Trade Works

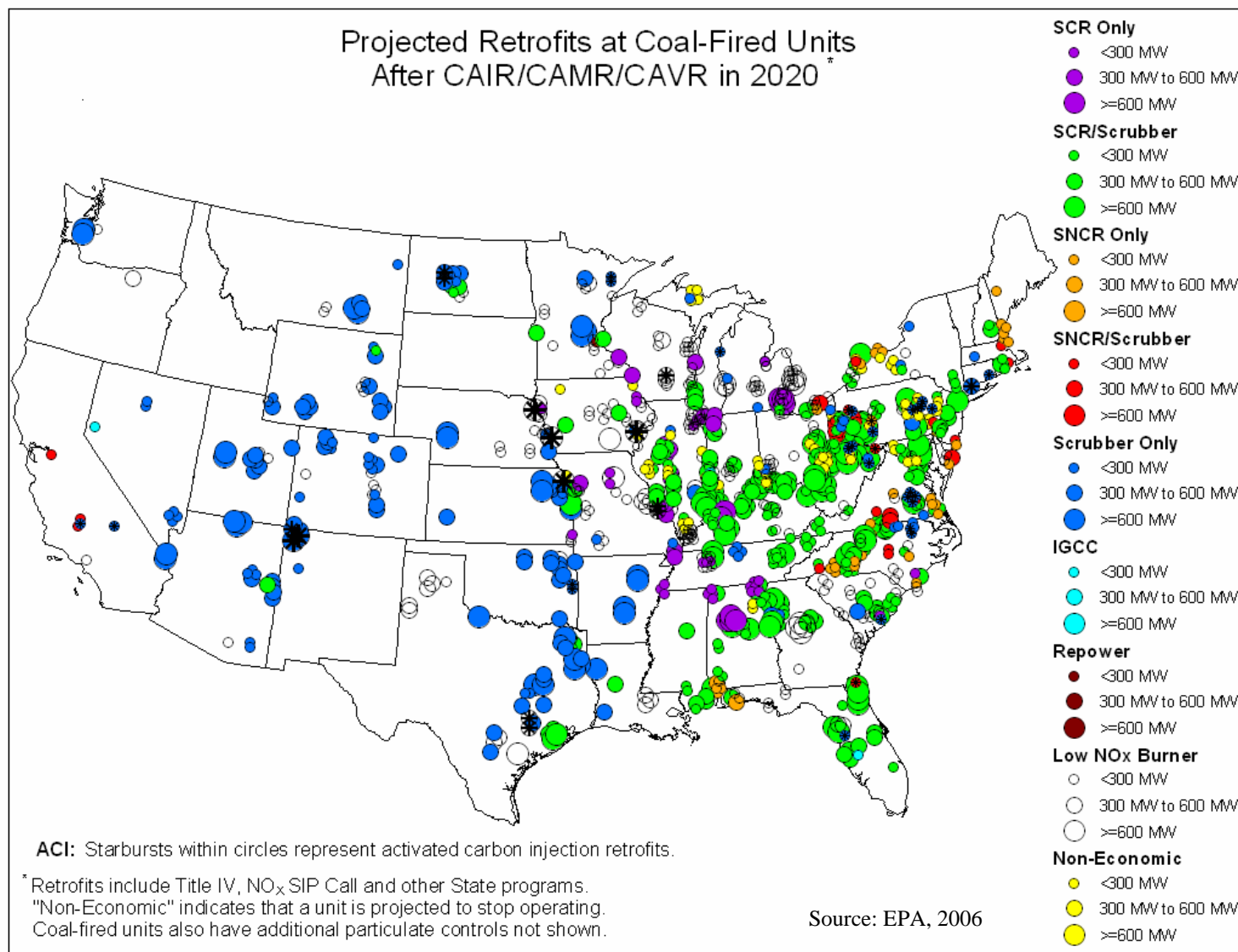
- 
- **Programs cover industries with wide variation in compliance options and costs that have capability to monitor and report emissions reliably**
 - **Cap on emissions – Government issues a fixed quantity of allowances**
 - **Focuses on environmental goal**
 - **Limits creation of “paper credits” and “anyway tons”**
 - **Provides certainty to allowance market**
 - **Full sector coverage – all sources (existing and new) included**
 - **Minimizes shifting of production and emissions (“leakage”)**
 - **Achieves emission reduction goal without case-by-case review**
 - **Strong monitoring – accurate and complete measurement and reporting**
 - **Assures accountability and program credibility**
 - **Unrestricted trading and banking – complemented by source-specific limits where needed to protect local air quality**
 - **Allows companies to choose compliance options**
 - **Addresses “hotspots” with added direct controls, if they emerge**
 - **Reduces costs**



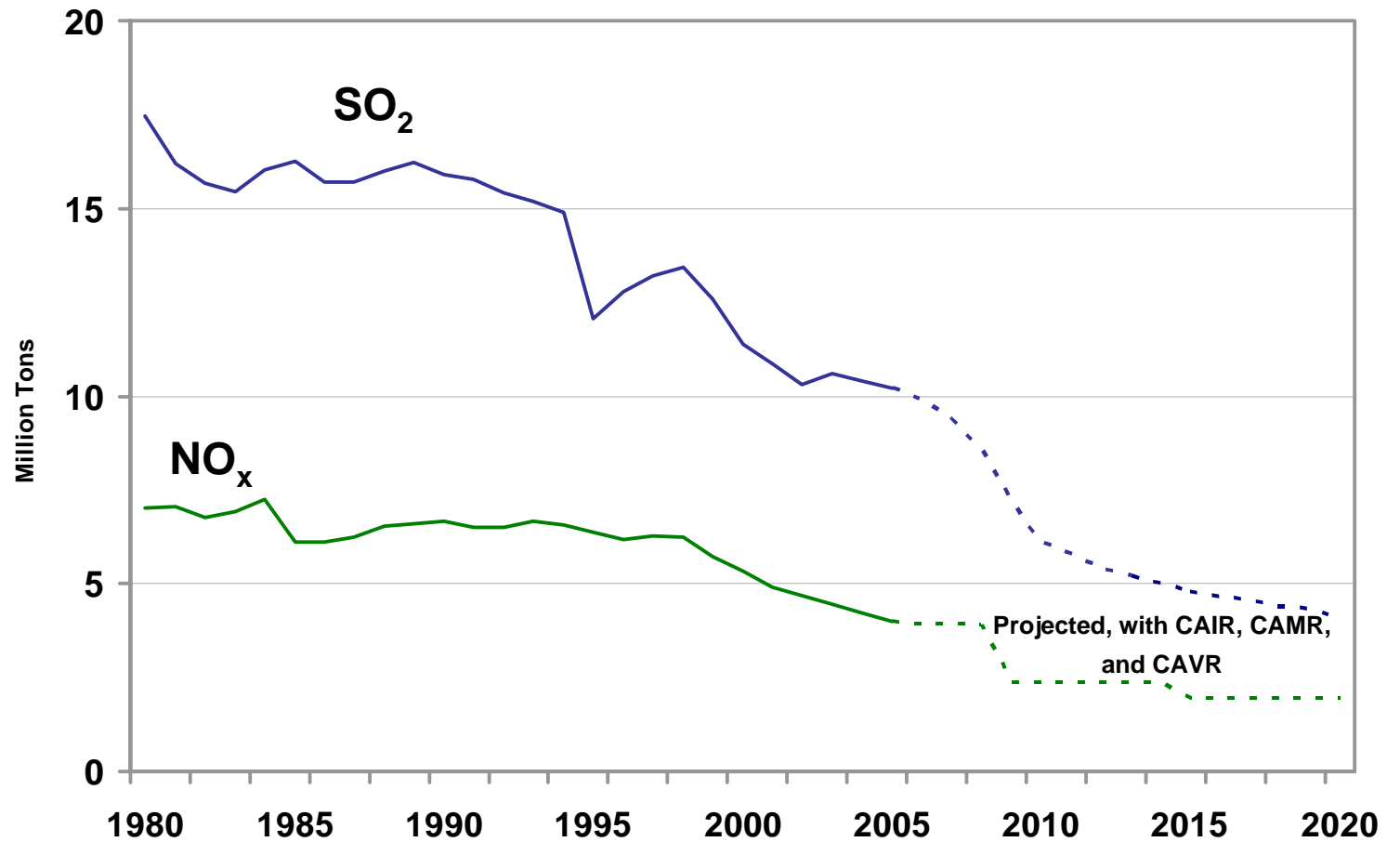
Compliance and Enforcement

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- **Annual reconciliation: Actual emissions compared to allowances in accounts**
 - **Penalties for non-compliance**
 - **SO₂ Program:**
 - **Automatic offset (deduct allowance from next year's allocation) *keeps "environment whole"***
 - **Automatic inflation-indexed financial penalty (about \$3,000 per ton of SO₂ in 2005)**
 - **Possible civil and criminal penalties**
 - **NBP, CAIR and CAMR Programs**
 - **3 allowances surrendered for each ton from next year's account (no automatic monetary penalty)**
 - **Possible civil and criminal penalties**
 - **99.9% compliance rate for both ARP and NBP programs**
 - **Penalties have ranged from \$3,000 to \$1,500,000**

Pollution Controls in Place in the Power Industry 2020 with Addition of CAIR/CAMR/CAVR



Nationwide SO₂ and NO_x Emissions from the Power Sector with Cap and Trade Controls




Source: EPA, 2005





Some Lessons Learned

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- **It works!**
 - **Greatest reductions occur where the greatest emissions exist**
 - **This inoculates programs against “hot spots”**
 - **Trading provides broad regional reductions, but often should be considered with direct controls to strike right balance**
 - **Innovation happens!**
 - **Clarity of purpose, simplicity, and flexibility of trading and banking have combined to not only save money, but to provide:**
 - **Lower administrative efforts to manage regulatory programs**
 - **High level of compliance**
 - **More environmental protection**
 - **Keep it simple**
 - **Caps protect the environment, not allowance allocation**


Programs Designed *for* Compliance



- ***Key Compliance Elements:***
 - Accountability
 - Simplicity of design and operation
 - Incentives for data accuracy and completeness
 - Communications and outreach
 - Continuous improvement



Accountability

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- **Accurate and complete emissions measurement**
 - Solid government quality assurance and verification
 - 100% of the CEMS units are audited
 - Statistical analyses used to identify “suspicious” units
 - Targeted field audits
 - **Standardization of emissions and quality assurance data**
 - **Transparency of emissions and trading information**
 - **Predictable consequences for noncompliance - Automatic penalties**

Simplicity of design and operation



- **Minimal, but effective government role**
 - About 30 analysts implement both Acid Rain and NO_x Budget programs
- **Implementation and compliance**
 - Centralized
 - Integrated
- **Simple and easily understood rules**
 - Guidance documents that explain the rules

Incentives for data accuracy and completeness



- **Incomplete or inaccurate data translates into financial consequences**
 - Data substitution procedures
 - Frequency of testing
- **Monitoring flexibility without compromising accuracy**
 - Several monitoring approaches
 - Petition process

Communication and Outreach



- **Participation in Major Conferences**
 - Annual monitoring conference serves as forum to report to stakeholders
- **Training workshops for states and sources**
- **Daily communications with sources**
 - Resolution of data issues or testing requirements
- **Open discussions relating to policy changes or rule interpretation**
- **Strive for environment of trust and collaboration**


Continuous Improvement



- **New auditing checks added frequently**
 - Including ad-hoc checks and indicators of possible problems
- **Getting sources to “audit themselves”**
 - Some audit software is available to sources
- **A solid monitoring program can be achieved over time if program design allows for it**



Summary

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- Over the past decade, the Acid Rain and NOx Budget Trading Programs have achieved unparalleled levels of SO₂ and NOx emission reductions in the U.S.
 - Success has been largely due to many years of implementing comprehensive and strict, yet realistic monitoring, reporting and verification requirements, based on sound principles
 - These principles, if followed, can work for other programs