Model NOx Cap and Trade Rule Workshop

Part I

Presentations

- Elements of Model Rule
- Applicability and Monitoring
- Emissions Limitations
- Considerations for Using Output for Allowance Allocations
- Emissions Banking

December, 1997

Model NOx Cap and Trade Program

Elements of Model Rule

Robert LaCount
December 10-11, 1997
Arlington, VA

Elements of Model Rule

- Blueprint for mulitstate program
- States may adopt by reference or use language consistent with the model rule
- Will contain all elements State rules would need to be consistent

State / EPA Responsibilities

- States:
  - Determine source allocations, approve monitoring systems, enforce compliance provisions
- EPA:
  - Collect emissions data, allocate allowances as prescribed by States, record trades, perform annual reconciliation

Applicability

- Identify minimum group of sources to be included in rule
- Establish criteria for including additional sources into State rules
- Specify process for individual "opt-ins"

Emissions Limitations

- Allowance - based cap and trade program
- States responsible for determining allowance allocations
- Total number of allowances not to exceed tons apportioned by State in SIP
- Specify details for timing of allocations and recommend method for allocating allowances

Emissions Trading Provisions

- Currently assumed that program will establish unrestricted trading zone across all participating States
- Allowances may be traded among participating sources and other private parties
- EPA proposes to administer allowance transfer process
- Trades to be completed by submitting transfer form, no additional verification or approval required
- Banking provisions to be addressed

NOx Allowance Tracking System

- NATS would track allowance: allocations, transfers, and deductions for compliance
- Each affected unit would have compliance account
- Other parties may open general accounts
- Each account will have person authorized to manage allowances

Monitoring, Reporting and Compliance Demonstration

- Establish monitoring and reporting requirements (quarterly electronic reports)
- EPA would quality assure emissions data and include in Emission Tracking System
- EPA would match emissions to allowance holdings and notify States and sources of results

Integration with existing programs

- State Title V provisions and Title V permits would serve as mechanism for enforcement of program
- Permits would not require revisions for changes in emissions that are authorized through allowance holdings (except for local site-specific limitations)
- Clarify relationship with New Source Review requirements and Title IV NOx requirements

Non-compliance penalties

- Include penalties for excess emissions from a participating unit
- Offset penalty enforced by deducting allowances from a source's compliance account for the next control period at a pre-determined rate (e.g., 3 for 1)
- States would have authority to enforce financial penalties

Program Audits

- EPA and States would conduct periodic audit
- Focus on emissions monitoring and allowance use
- EPA would produce annual reports

Model NOx Cap And Trade Program
Workshop

Applicability and Monitoring

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Applicability and Monitoring

- Criteria to participate
- Core and additional sources
- Core sources defined
- Monitoring
  - General Criteria
  - Core Sources
- Additional sources

Criteria for Participating in a Cap and Trade Program

- Information available to establish initial emissions limitations
- Protocols to ensure accurate and consistent monitoring
- Substantial majority of emissions covered under trading cap
- Person responsible for compliance

Core and Additional Sources

- Develop an effective and workable program that can be implemented by 2003
- Core sources
  - Account for a significant portion of the emissions
  - Meet program participation criteria
  - Workable models exist to include sources in a program within a short time frame
- Additional sources

Core Sources Defined

- Existing fossil fuel fired combustion units serving electrical generators greater than 25 megawatts
- Other existing boilers and turbines with a heat input greater than 250 mmBtu/hr
- 6% of point sources covering 80% of point source emissions in the 2007 base case
- Lower threshold for new sources?

Features of a Monitoring and Reporting System under Trading

- Accurate and consistent monitoring and reporting requirements
- Reporting of all data needed to support program
  - Compliance (NOx mass = NOx emission rate * heat input)
  - Allocations
- Consistent quality assurance standards

Monitoring Options Under Proposed Revisions to Title IV

- Coal Units
  - NOx Emission Rate CEM
  - Flow and Diluent CEM for heat input
- Gas and Oil Units
  - NOx Emission Rate CEM
  - Several options for heat input
- Additional options for small or infrequently used Gas and Oil Units
  - NOx emission rate curves based on testing
  - Conservative NOx emission rates

Additional Sources

- Other point sources
  - Monitoring options consistent with core sources
  - Account for utilization/emission shifting for individual opt-ins
- Area and mobile sources
  - Must meet criteria for participation

Model NOx Cap and Trade Program

Emission Limitations

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Overview - Emission Limitations

- Metrics for setting emission limitations
- Process for setting and assigning emission limitations
- Auction
- Input / output data

Metrics for Setting Emission Limitations

- Allowance system vs. emission rate system
- Commentors generally favored allowances for environmental certainty and existing infrastructure
- EPA intends to propose an allowance - based, model cap and trade program

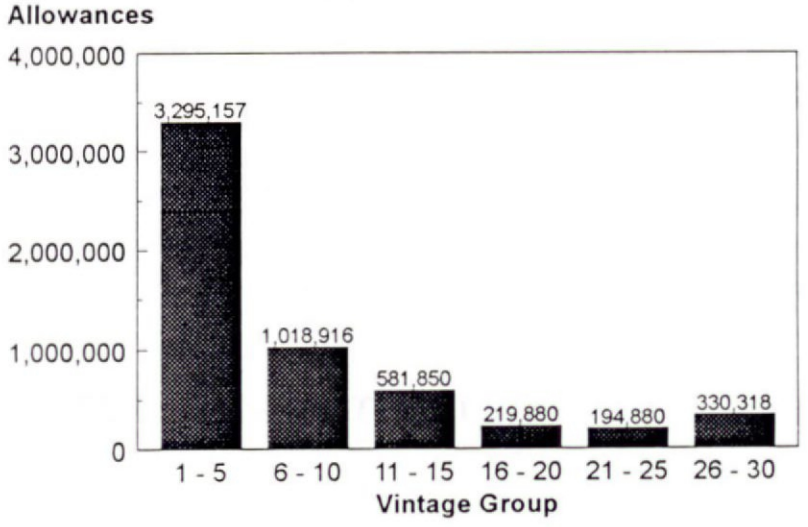
Process for Setting and Assigning Emission Limitations

- Prescription vs recommendation
- EPA proposes that model rule:
  - Establish timing requirements for when States would complete their allocations, time period allocations would cover, and date for submitting information to EPA
  - Recommend method for allocations, but allow States flexibility to deviate from recommendation

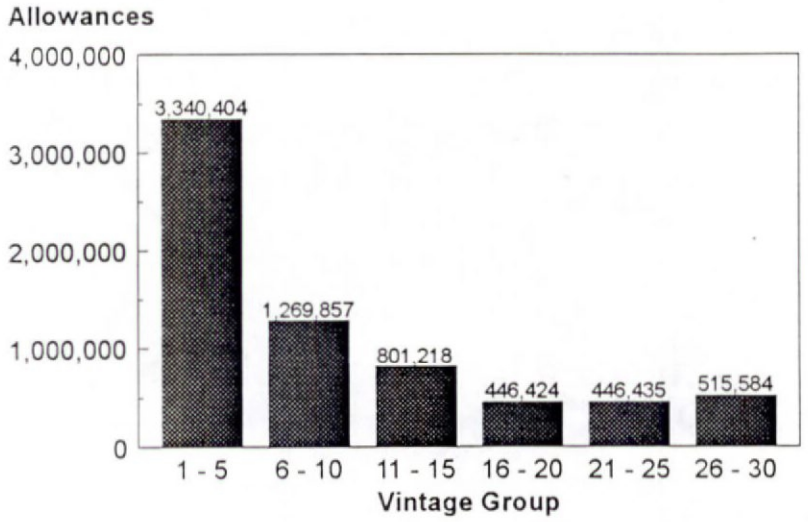
Timing Requirements

- Options for time periods:
  - One permanent allocation
  - Multi-year allocation (e.g., 5 - 10 years)
  - Rolling allocation (e.g., allocate 2003 - 2007 at one time, allocate 2008 allowances in 2003, allocate 2009 allowances in 2004, ...)
  - Annual allocation prior to control period
  - Annual allocation after control period
- Issues affected by timing of allocations:
  - Regulatory certainty for sources
  - Ability to address new sources
  - Administrative burden

SO_2 Allowances Traded in 1996



SO_2 Allowances Traded in 1997



Price Signal Auction

- SO_2 allowance auctions accelerated price discovery, providing useful information to industry
- Auctions may take many forms, be of various size, and be administered by government or private sector
- Should model rule recommend an auction and in what form?

Input and Output Data for Allowance Allocations

- Procedures and infrastructure are in place for collecting input data
- Procedures and infrastructure would need to be developed for output data
- Once developed, output protocols could be included in the model rule
- States wishing to use output data could include protocols in State rules

Model NOx Cap and Trade Program

Considerations for Using Output Data for Allocations

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Unit Types and Data Requirements

Unit Type	Output Data Needed	Measurements
Electricity producing	Electricity output	Wattmeter readings
Steam producing	Steam energy	Pressure, temperature, and mass flowrate of steam
Electricity and steam producing	Electricity output and steam energy	Wattmeter readings; pressure, temperature, and mass flowrate of steam

Output Data Collection Protocols

- Measurement frequency
- Accuracy (including bias)
- Missing data
- Data collection and reporting
- Quality assurance

Data Issues

- Relationship between electrical generation and process steam
- Gross vs. net generation
  - Gross generation
    - Easier to determine?
    - Not affected by auxiliary power use
  - Net generation
    - Promotes greater efficiency
    - Difficult to determine?

Figure 1. A Simple Boiler/Generator Configuration

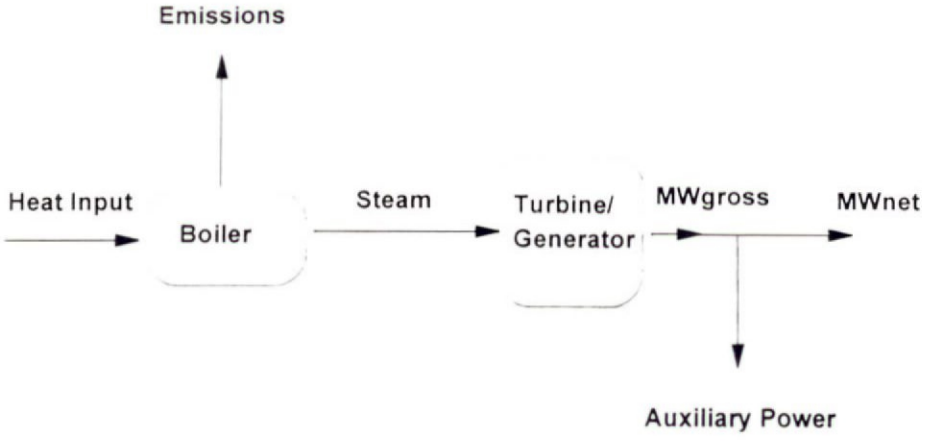
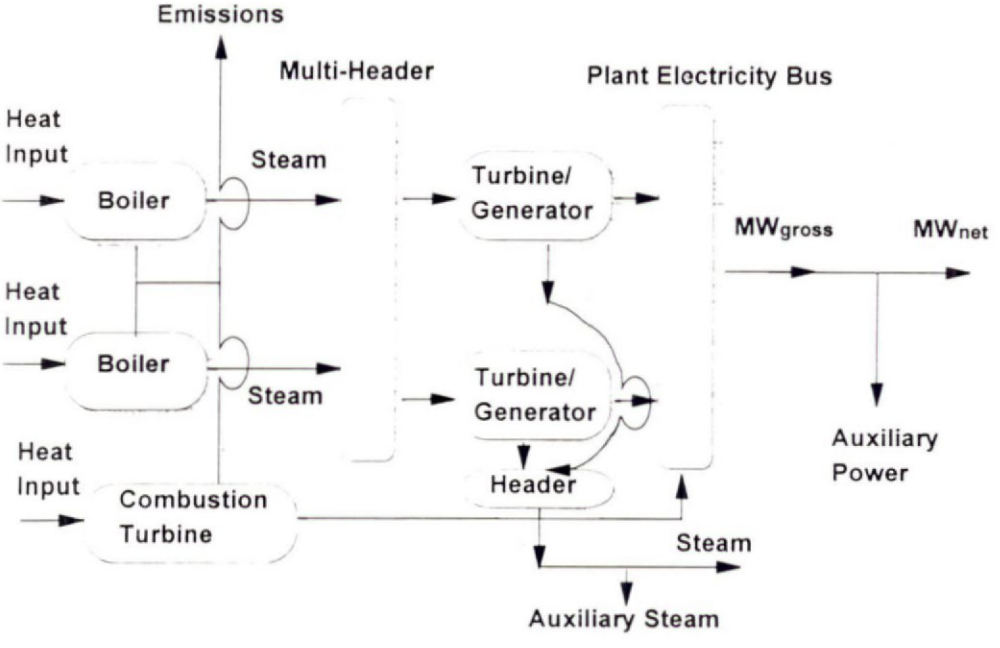


Figure 2. A Multi-Unit Cogeneration Configuration



Banking
in a NOx Trading Program

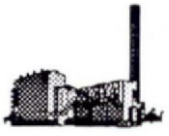
December 1997

Model NOx Trading Rule Meeting

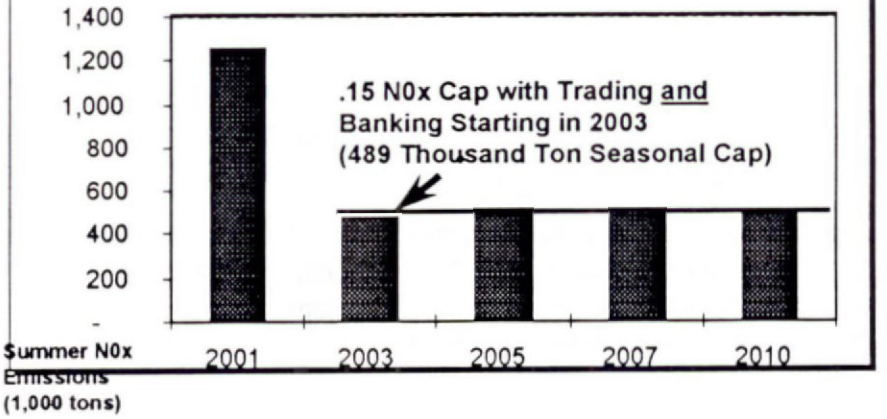
Presentation by

Office of Air and Radiation

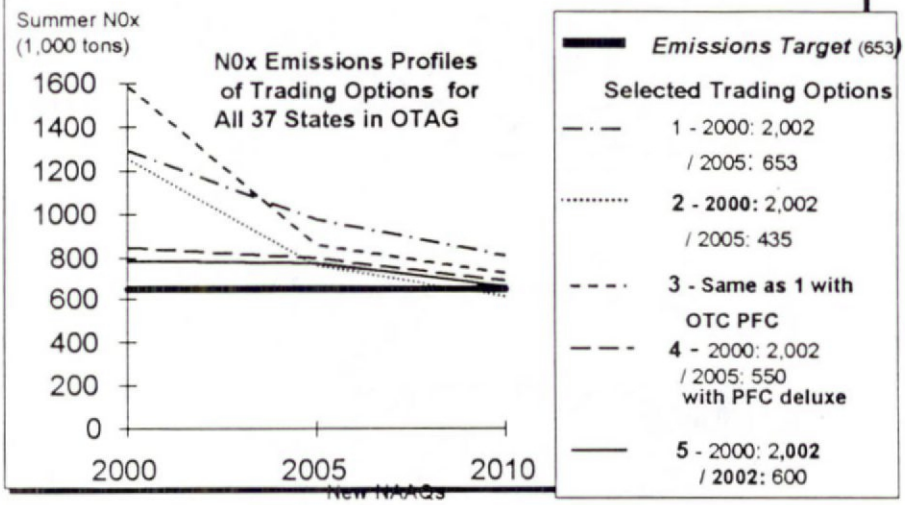
U.S. EPA



Proposed Budget for the Electric Power Industry Is Based on a Trading Program that Allows Banking



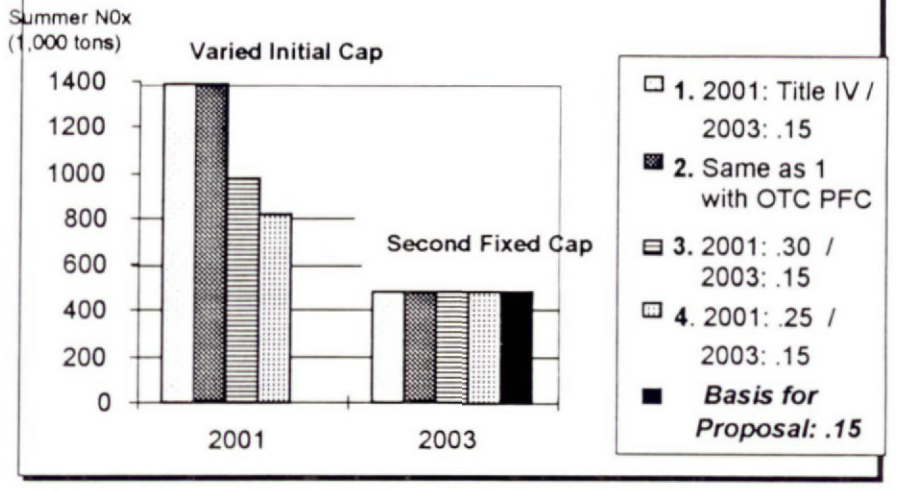
Although Banking Offers Benefits, Past Analysis Raised Environmental Concerns



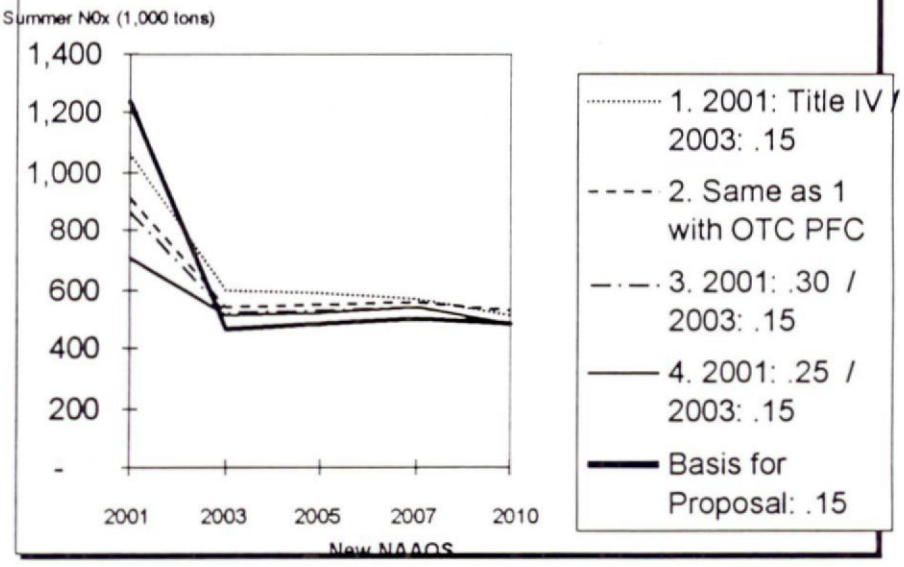
There Are Several Ways to Adjust Emissions Levels over Time in a Banking Program

- **Elements of Banking Program:**
  - Number of Emissions Caps
  - Levels of Emissions Caps
  - Dates of Emissions Caps
  - Time Intervals Between Emissions Caps
  - Management of Banking (e.g., Flow Controls)
- **EPA Analyzed Some Simple Phased-in, 2 Cap Scenarios Using IPM.**
- **EPA Is Examining How to Best Structure Other Elements to Maximize the Environmental Benefits and Flexibility of a Trading Program.**

EPA Analyzed 4 More Scenarios to Show How Phased-in Banking Could be Added to a Trading Program



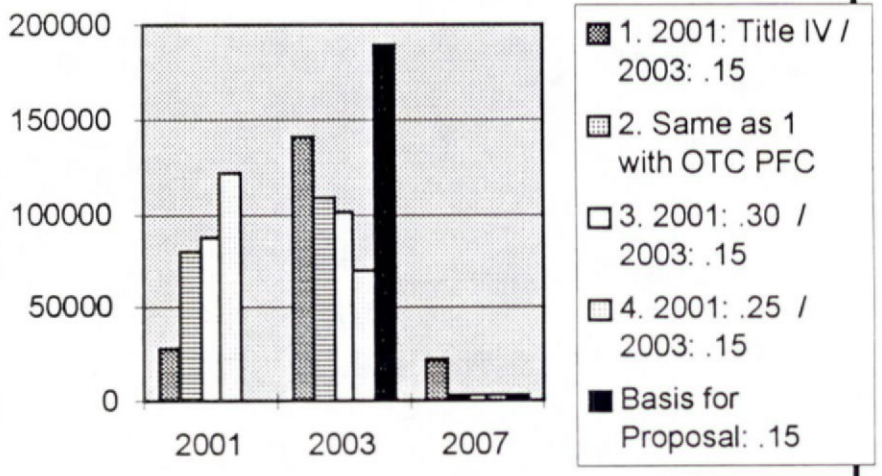
Summer NOx Emissions
Results from the Phased-in Banking Scenarios



Other Initial Findings

- Initial Examination of the Scenarios' Costs Relative to the Initial Approach Shows:
  - Annual Costs Begin Earlier for the Scenarios and Are Spread Out over a Greater Time Period
  - All the Scenarios Are Cost-effective – Below $1,700 per ton
- Limitations in the Modeling. Banking Grants Flexibility and Other Benefits that Are Not Captured in IPM Modeling.
- New Scenarios Showed Another Potential Benefit

Forecasted Retrofits of Coal-Fired Units by Scenario
(Megawatts of Capacity)



EPA forecasts there will be about 203 thousand MWs of coal-fired capacity in the 22 States and District of Columbia that are covered in the Proposed Ozone Transport Rulemaking in 2000.

Comments

- If You Believe There Are Better Ways to Structure Banking, Indicate Specifically How to Do So. Please Describe in Detail Why They Are Better.
- If You Believe that There Are Benefits and Costs of Banking that Our Emissions/Cost Model Isn't Evaluating, Please Identify and Describe Them in Detail.