



# **5th ANNUAL CLEAN COAL TECHNOLOGY CONFERENCE**

**Remarks of  
Brian J. McLean,  
U.S. EPA**

January 9, 1996  
Tampa, Florida

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# ENVIRONMENTAL CONCERNS

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Public Health

Ozone

Fine Particles

Toxics

Environment

Acidification

Eutrophication

Materials Damage

Crop/Forest Damage

Visibility/Regional Haze

Climate Change



## GOAL OF TITLE IV

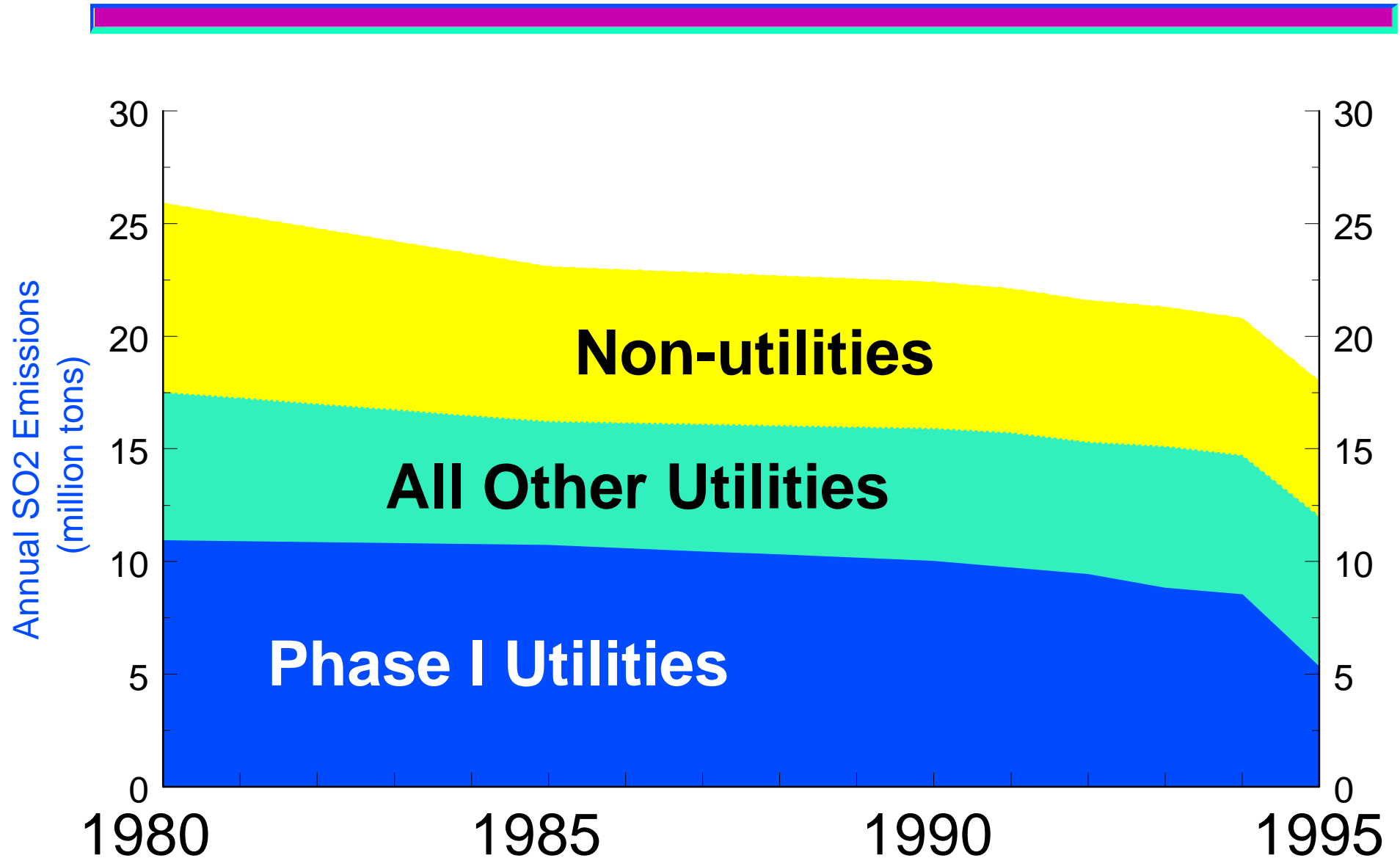
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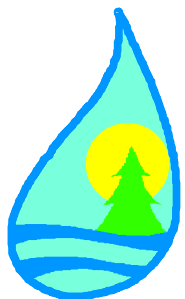
To reduce SO<sub>2</sub> and NO<sub>x</sub> from power generation as cost-effectively as possible in order to protect public health and the environment



# NATIONAL SO<sub>2</sub> EMISSIONS

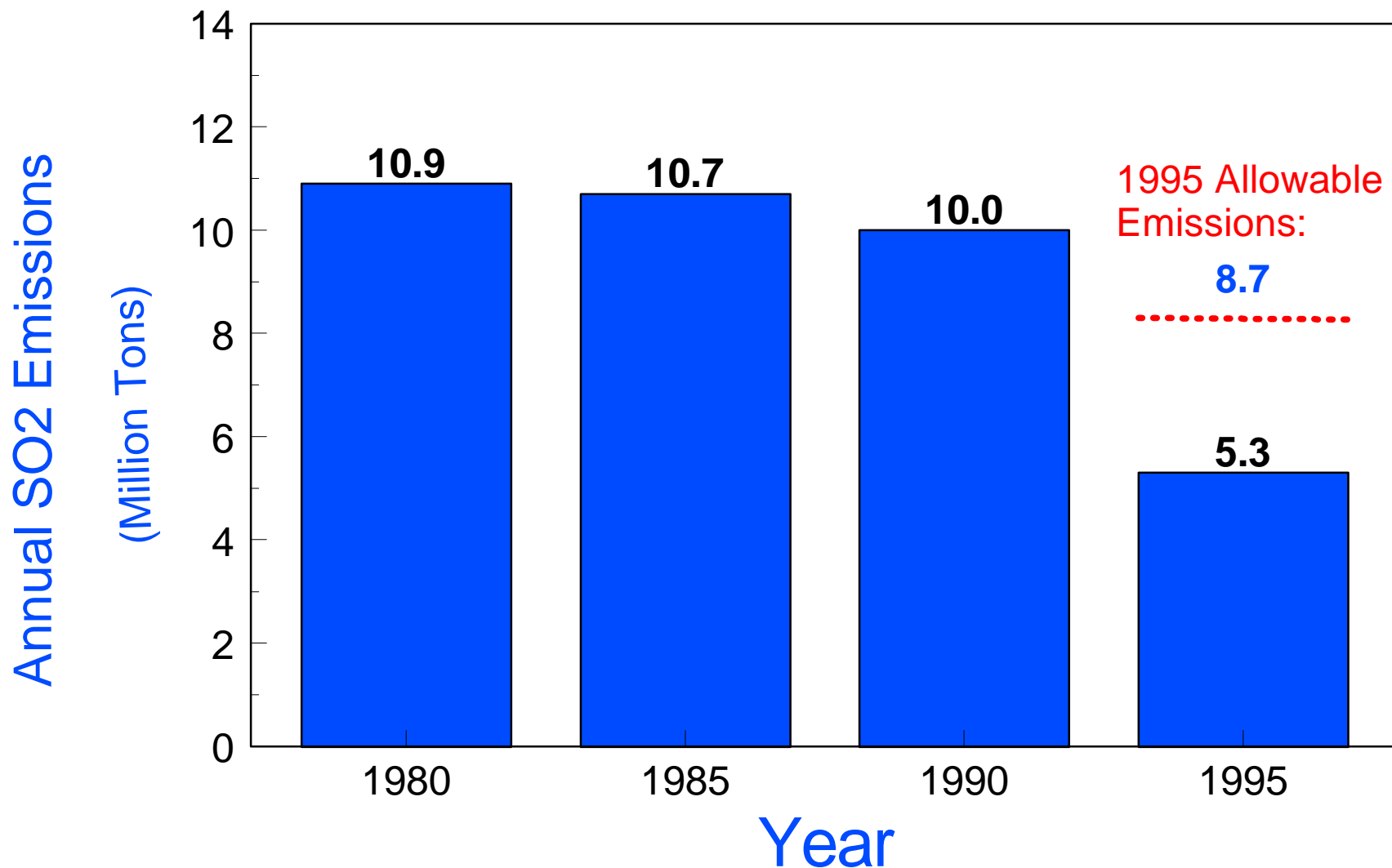
## All Sources





# SO<sub>2</sub> Emissions

445 Phase I Affected Utility Units





# REDUCTIONS IN WET SULFATE DEPOSITION





# SO<sub>2</sub> ALLOWANCE PROGRAM: BENEFITS

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- Health: \$12 - 40 billion per year by 2010
- Visibility: \$3.5 billion per year by 2010
- Fewer acidic lakes & streams
- Reduced damage to buildings & monuments

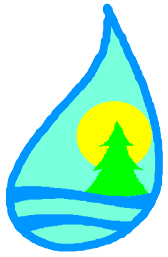


# SO<sub>2</sub> ALLOWANCE PROGRAM: COSTS

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- In 1990, estimated to cost \$4 billion per year by 2010
- By 1994, estimated cost dropped to \$2 billion per year by 2010
- Less than half the cost of command and control: \$5 billion per year
- 1 percent of government air pollution control personnel for 40 percent of emissions reductions under 1990 Clean Air Act

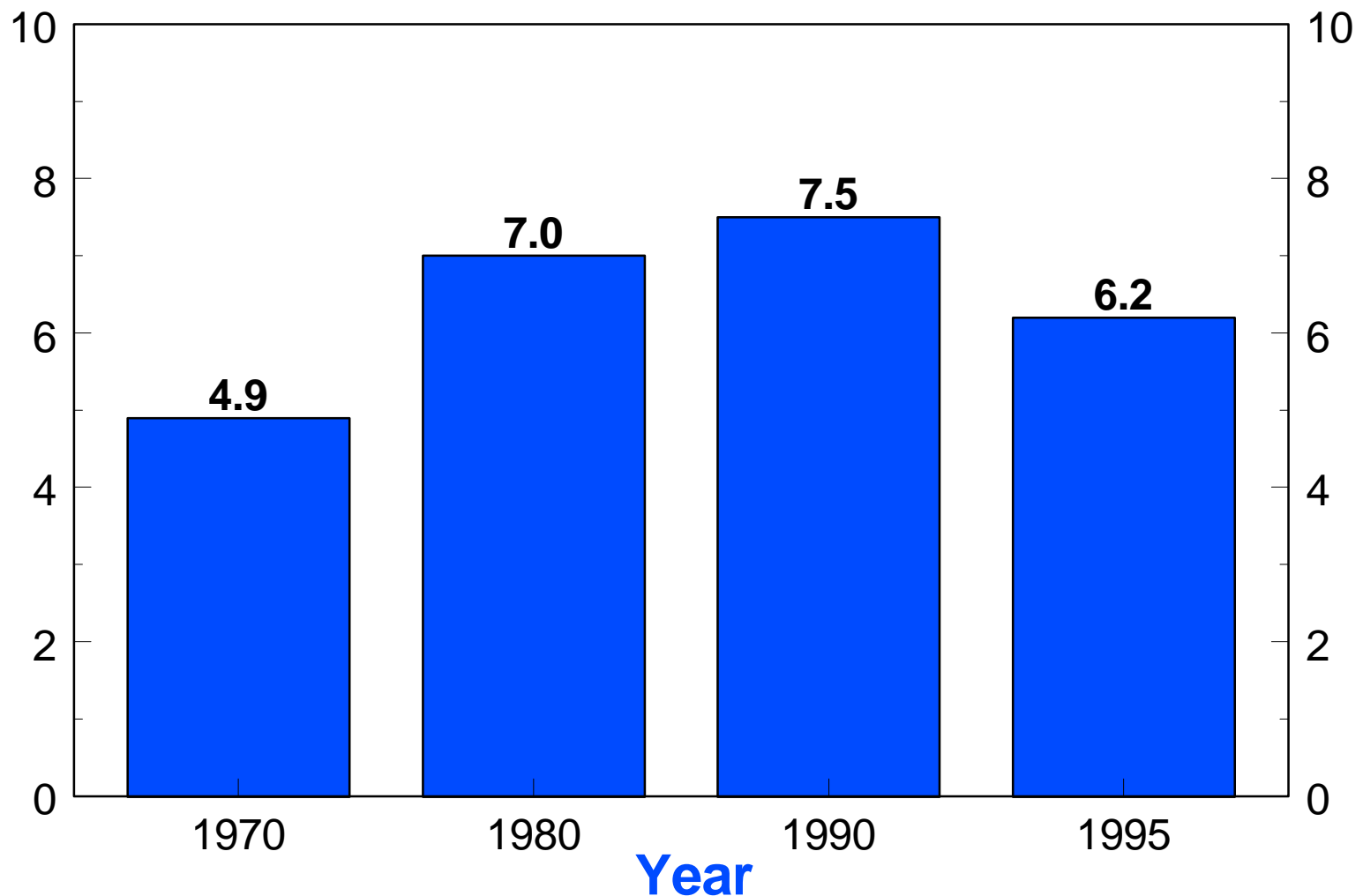


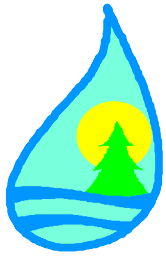


# UTILITY NO<sub>x</sub> EMISSIONS

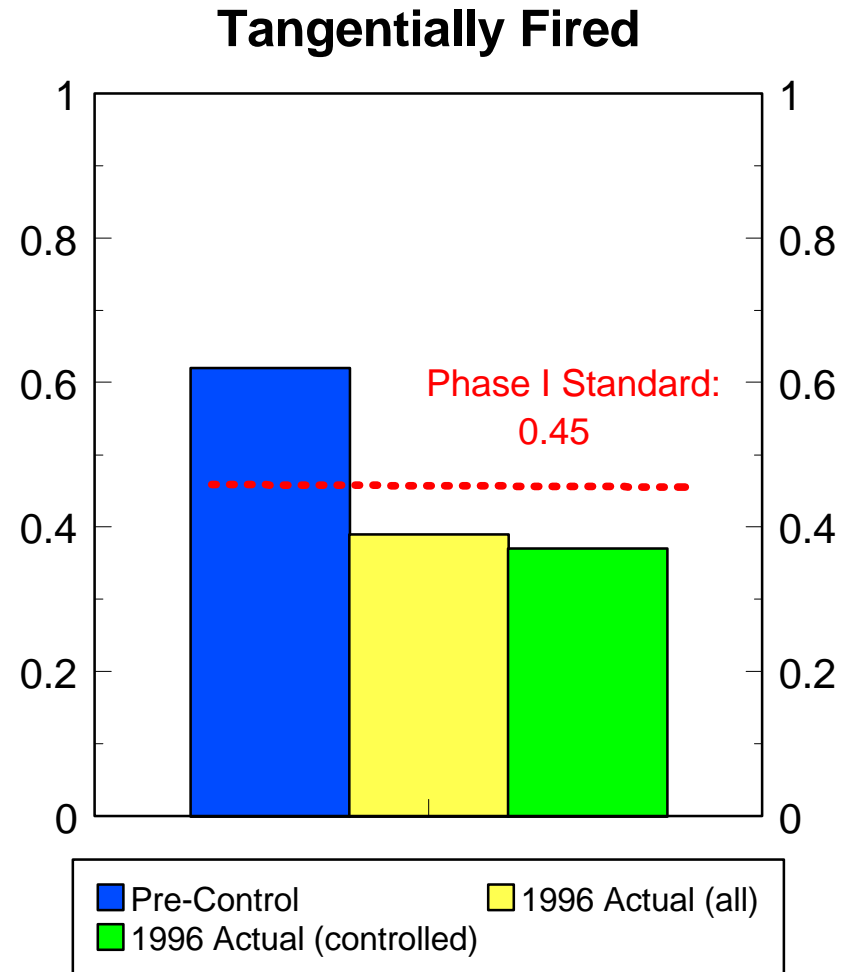
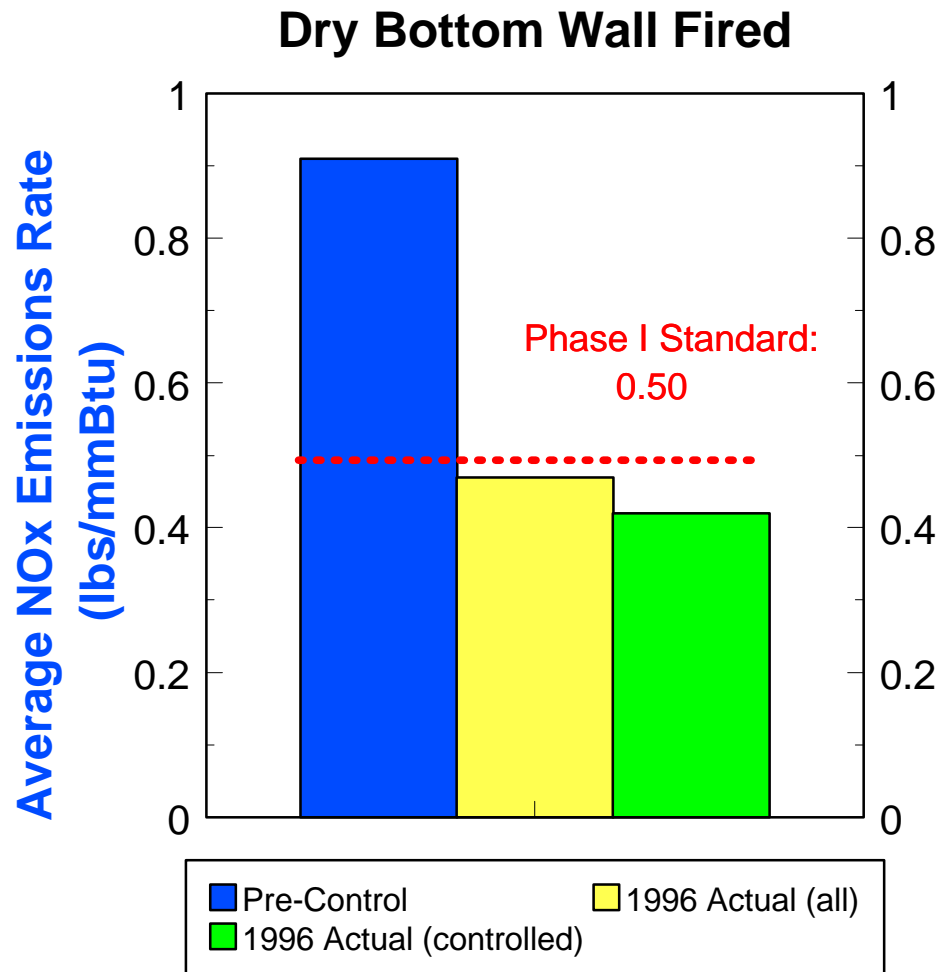
(1/3 of total U.S. NO<sub>x</sub> emissions)

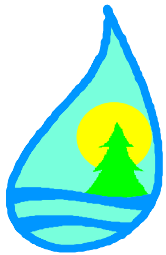
Annual NO<sub>x</sub> Emissions  
(Million Tons)





# Group 1, Phase I NOx Emission Rates

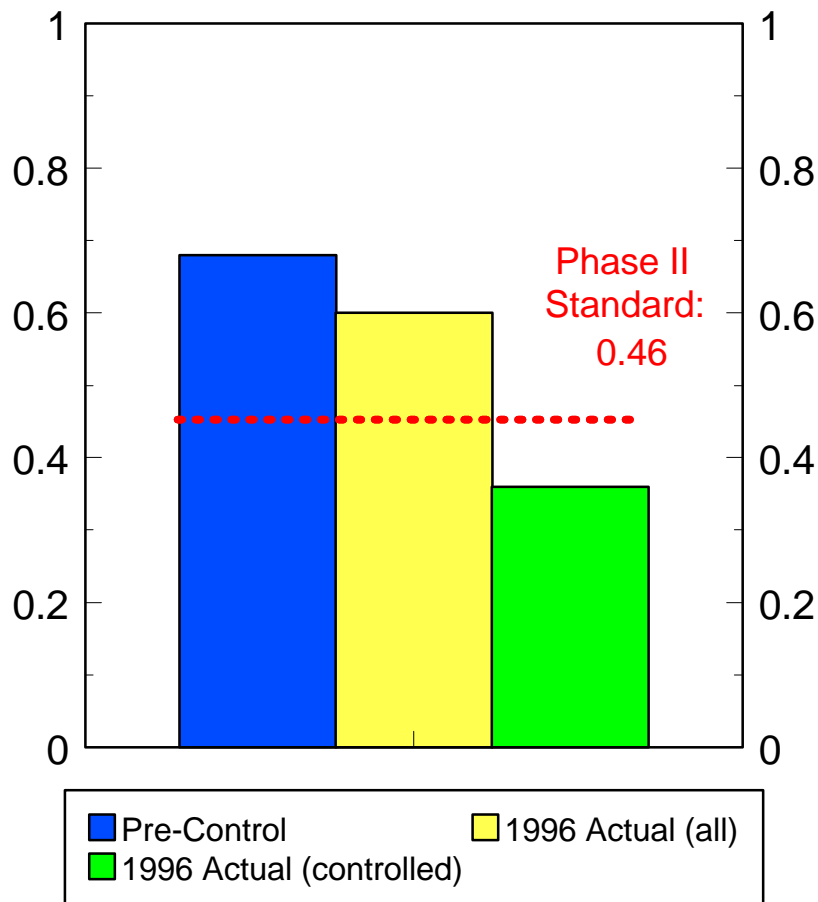




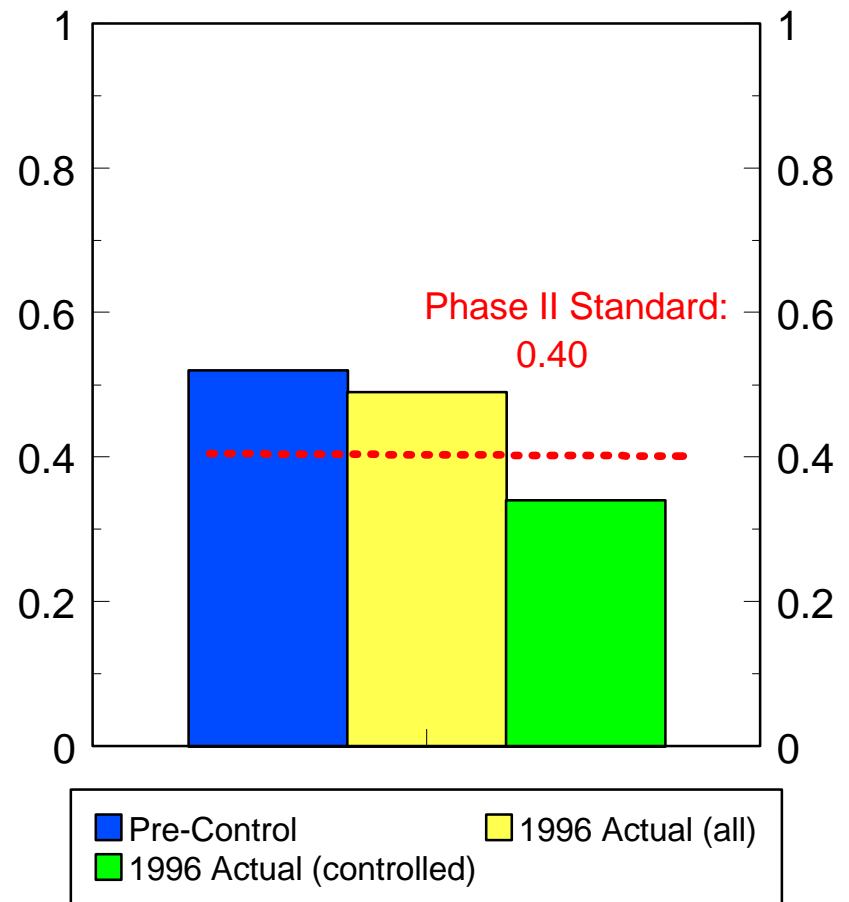
# Group 1, Phase II NOx Emission Rates

**Dry Bottom Wall Fired**

Average NOx Emissions Rate  
(lbs/mmBtu)



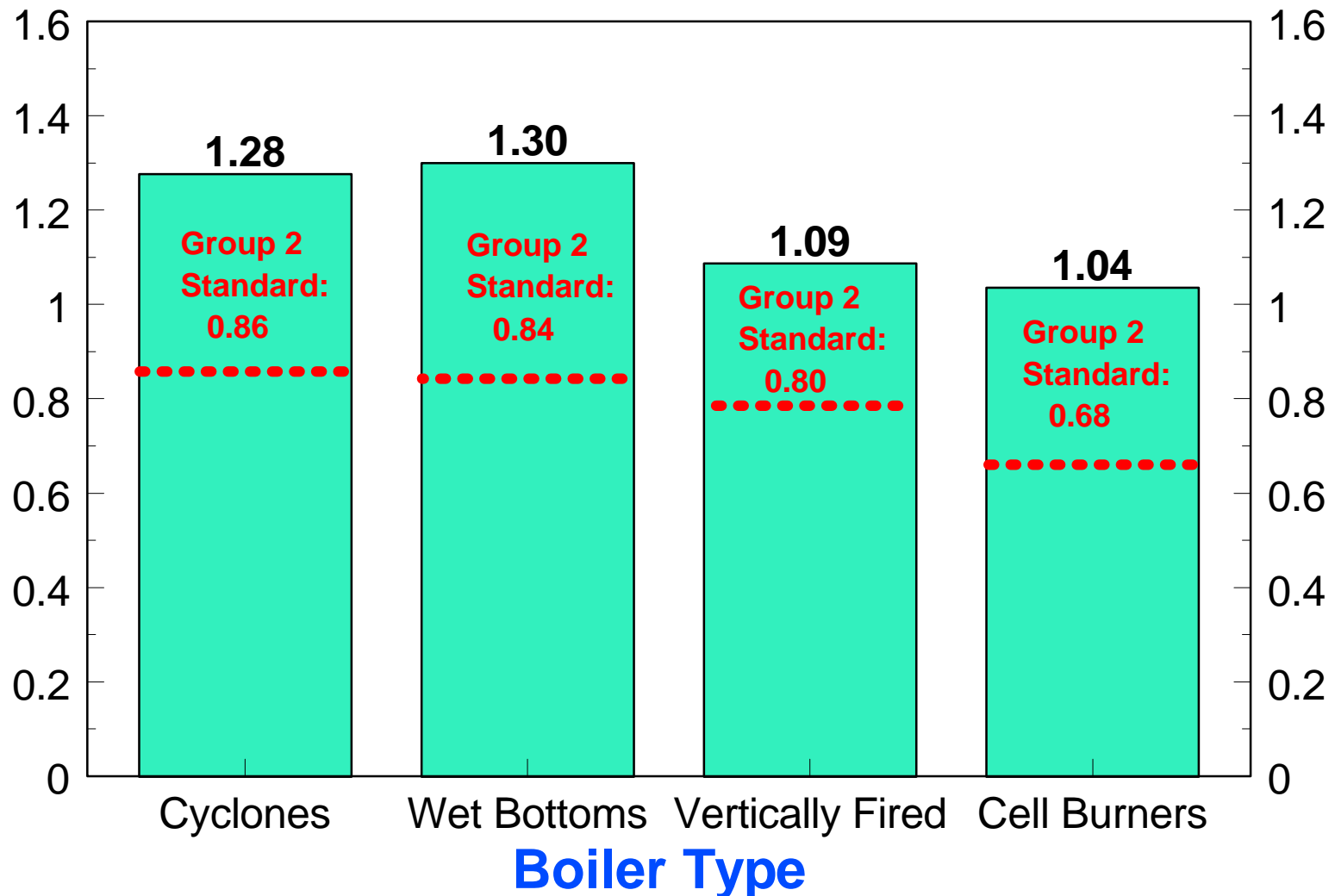
**Tangentially Fired**

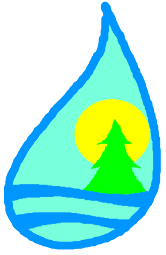




# GROUP 2 BOILERS NO<sub>x</sub> EMISSION RATES

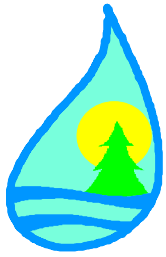
Average NO<sub>x</sub> Emissions Rate  
(lbs/mmBtu)



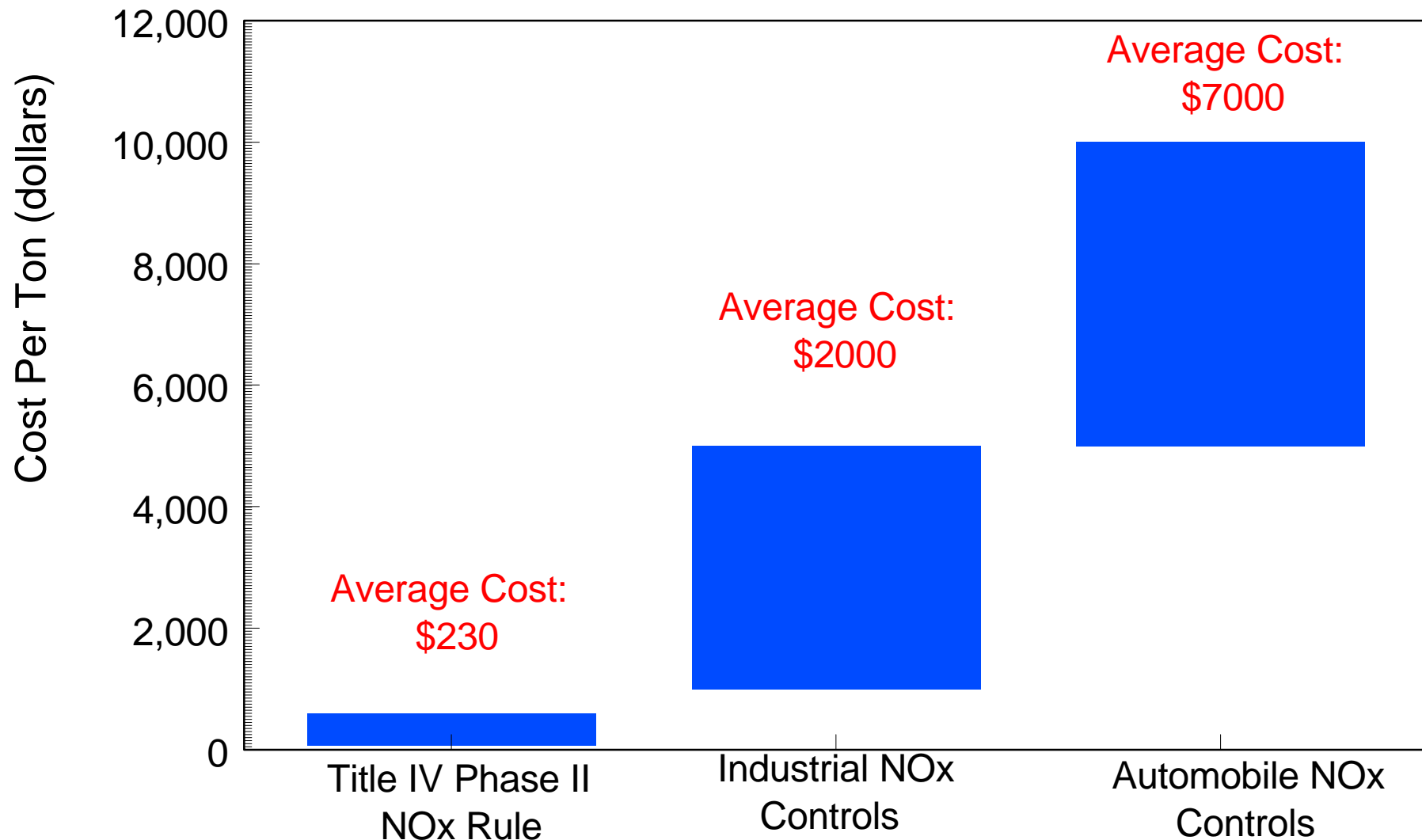


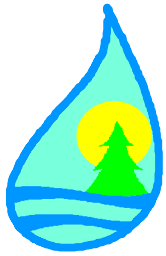
# NO<sub>x</sub> COMPLIANCE OPTIONS

- Boiler-by- boiler compliance with annual emission limitation
- Emissions averaging across holding or operating company
- Alternative Emission Limitations (AEL) for boilers unable to meet limits with Low NO<sub>x</sub> Burners (LNB's) or Group 2 Technology
- Early Election option for Phase II, Group 1 boilers
- Cap & Trade option for Phase II boilers



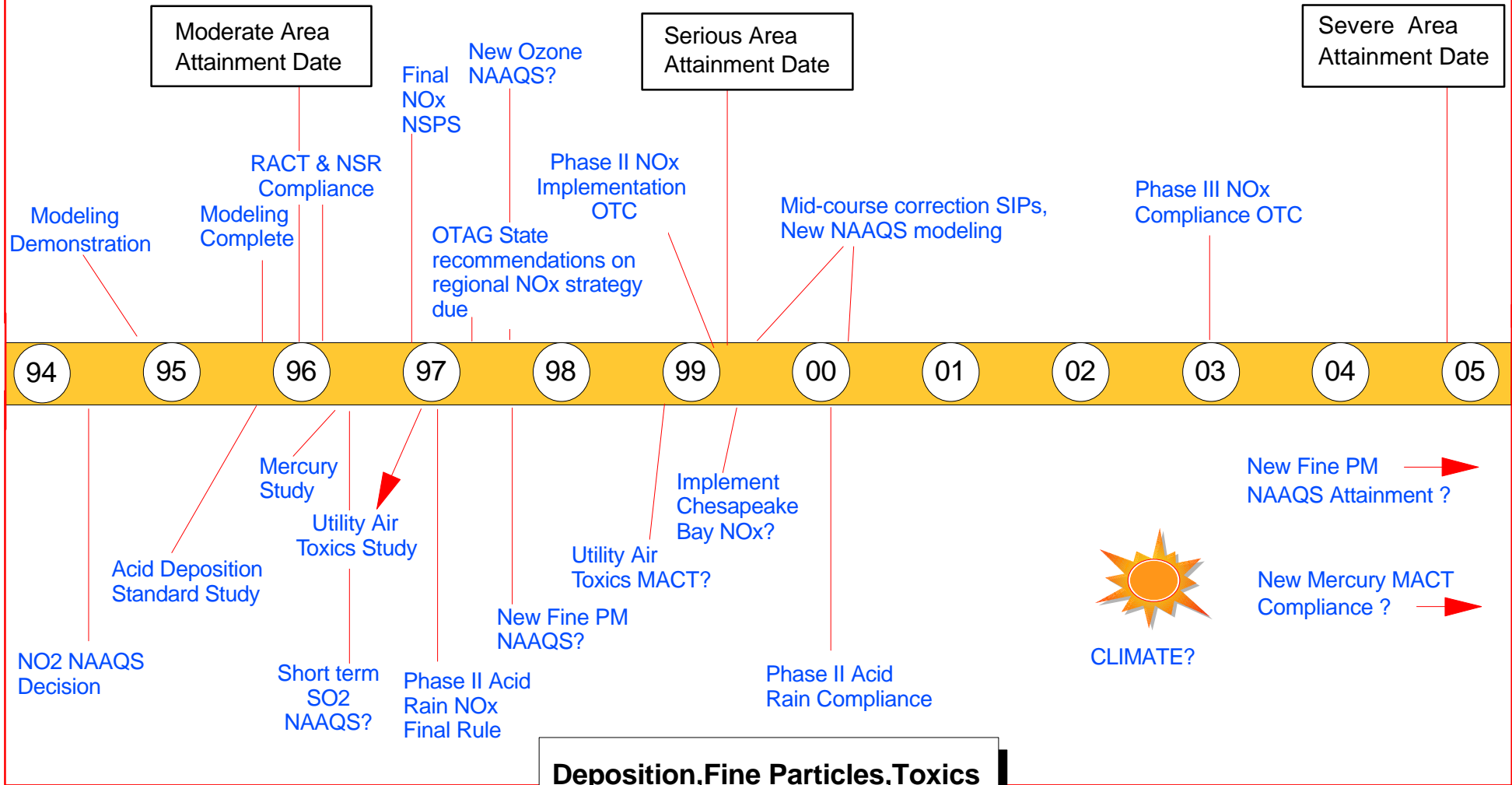
# COST EFFECTIVENESS OF NO<sub>x</sub> CONTROL (by Source Category)





# Electric Power Regulations Timeline - Clean Air Act

## Ozone Nonattainment Program



NAAQS - National Ambient Air Quality Standards  
NSR - New Source Review  
NSPS - New Source Performance Standards  
OTC - Ozone Transport Commission

OTAG - Ozone Transport Assessment Group  
SIP - State Implementation Plan  
MACT - Maximum Available Control Technology



# CLEAN AIR POWER INITIATIVE

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Goal: To develop an integrated strategy for achieving the goals of the Clean Air Act with respect to the power generating industry





# WHAT WOULD A NEW APPROACH LOOK LIKE?

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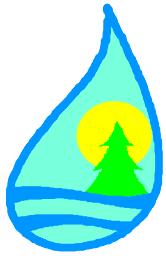
- Translate health & environmental goals into emission targets
- Employ cap & trade with banking
- Provide more certainty, flexibility, & cost savings
- Reduce continuous and disjointed regulatory hits



# SCENARIOS ANALYZED

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- Traditional Regulatory Approach
- Nationwide caps on NO<sub>x</sub>, SO<sub>x</sub>, (and possibly mercury), with trading & banking



# NO<sub>x</sub> CAP & TRADE SCENARIOS ANALYZED

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## Year 2000

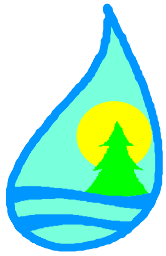
Set allowance caps based on Title IV NO<sub>x</sub> rule

Summer = 2.2 million tons

Winter = 2.9 million tons

## Year 2005 (3 Scenarios)

Lowered summer allowance cap to 1.3 million tons, 1.0 million tons, and 0.8 million tons (based on 0.25, 0.20, & 0.15 lbs/mmBtu rates)



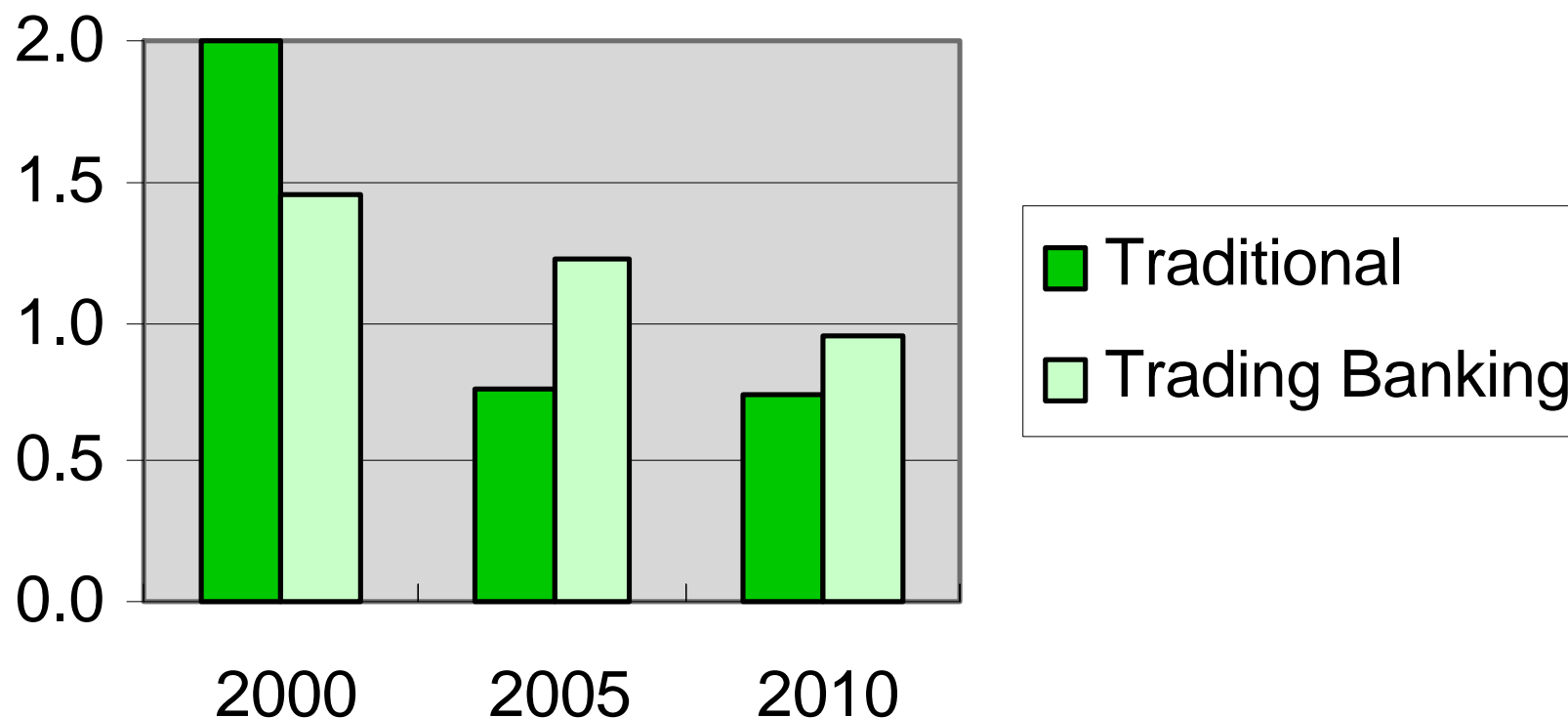
# SO<sub>2</sub> CAP & TRADE SCENARIOS ANALYZED

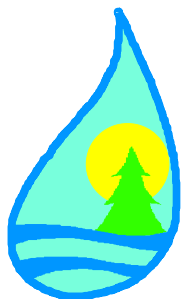
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- Lowered Title IV allowance allocations by 50 percent in 2010
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- Lowered Title IV allowance allocations by 50 percent in 2005

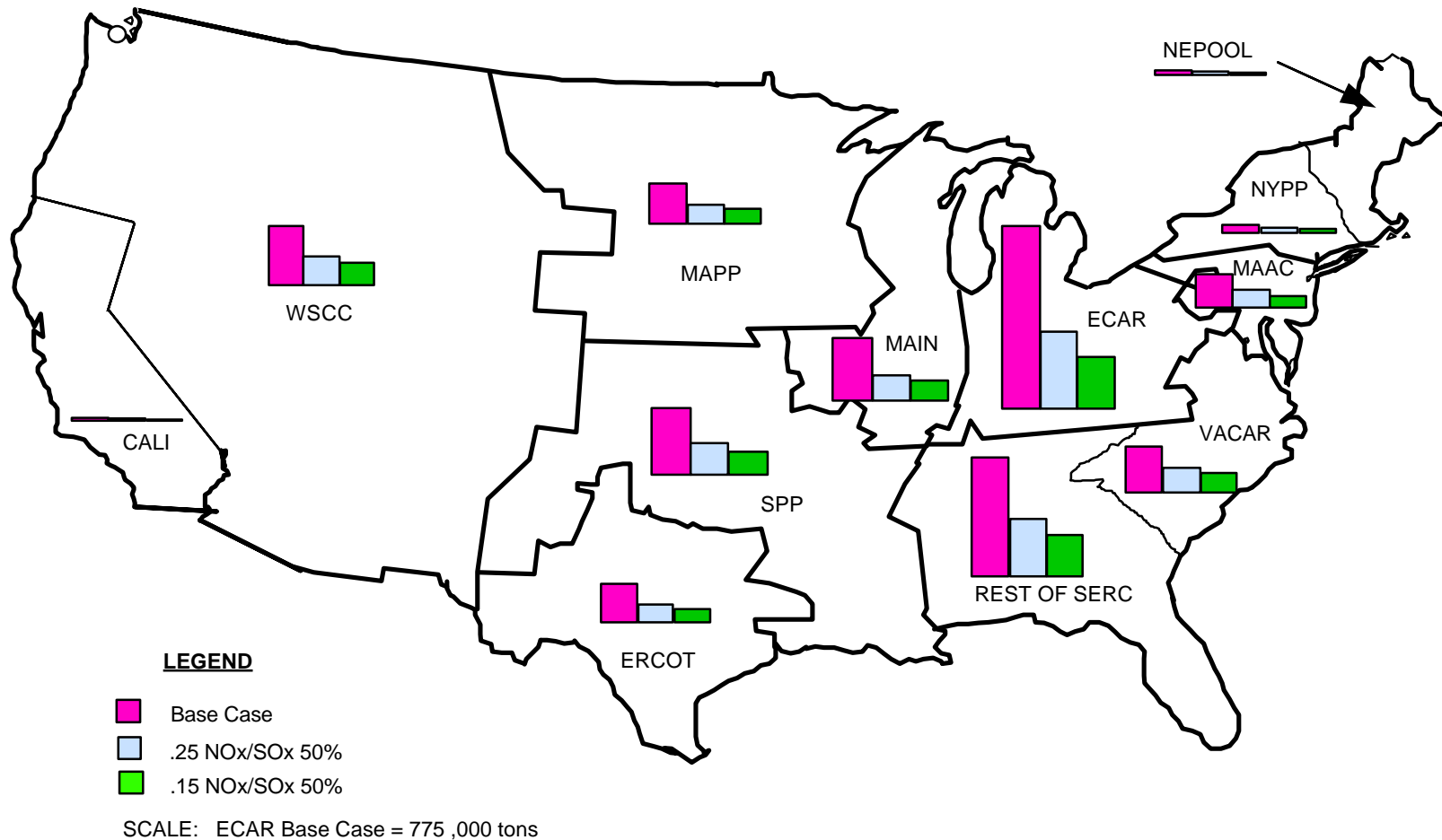


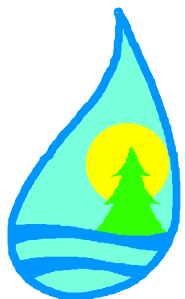
## Summer NO<sub>x</sub> Emissions of the Traditional and 0.15 NO<sub>x</sub>/SO<sub>x</sub> 50% Trading/Banking Options (million tons)



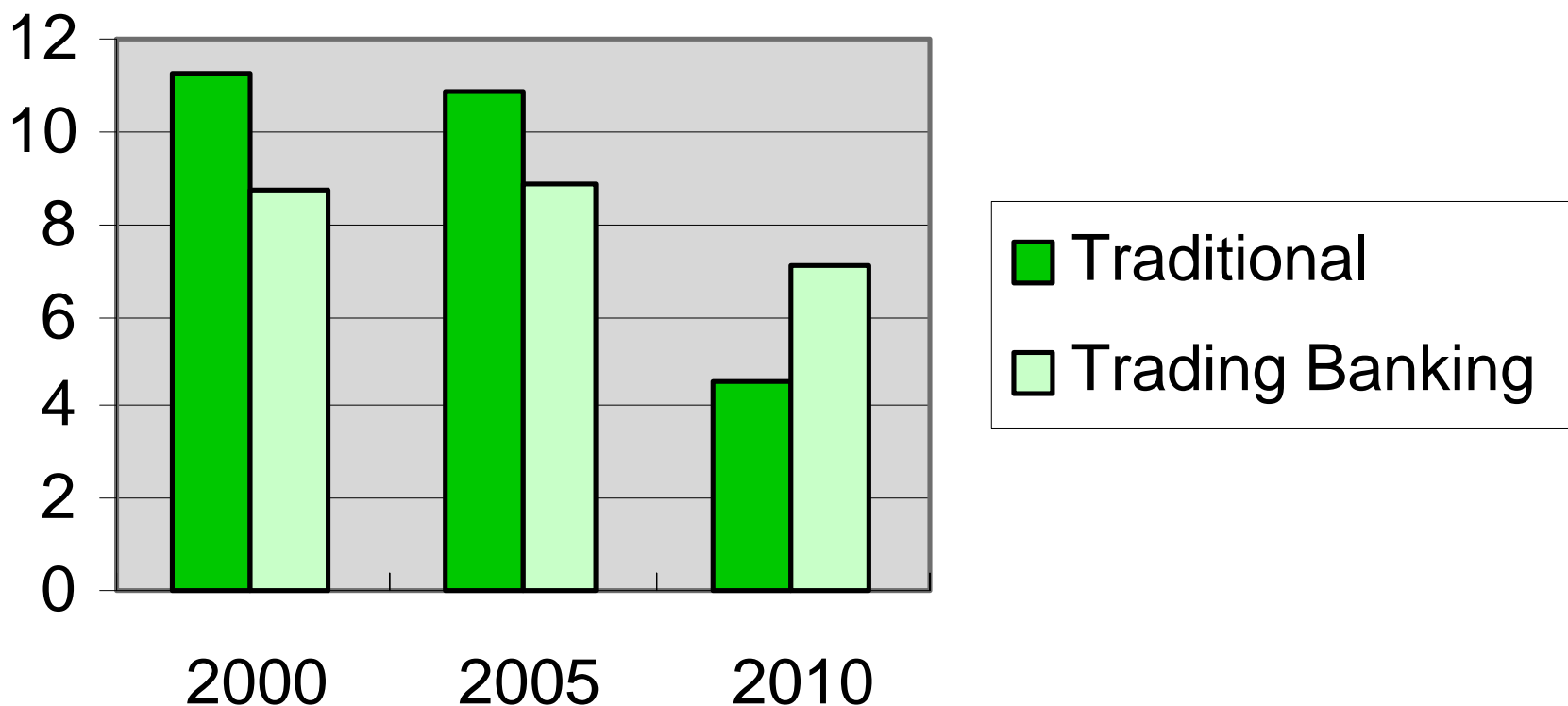


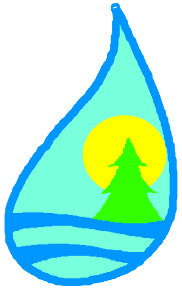
# Comparison of Summer NO<sub>x</sub> Levels in 2010 for the 0.15 and 0.25 Options



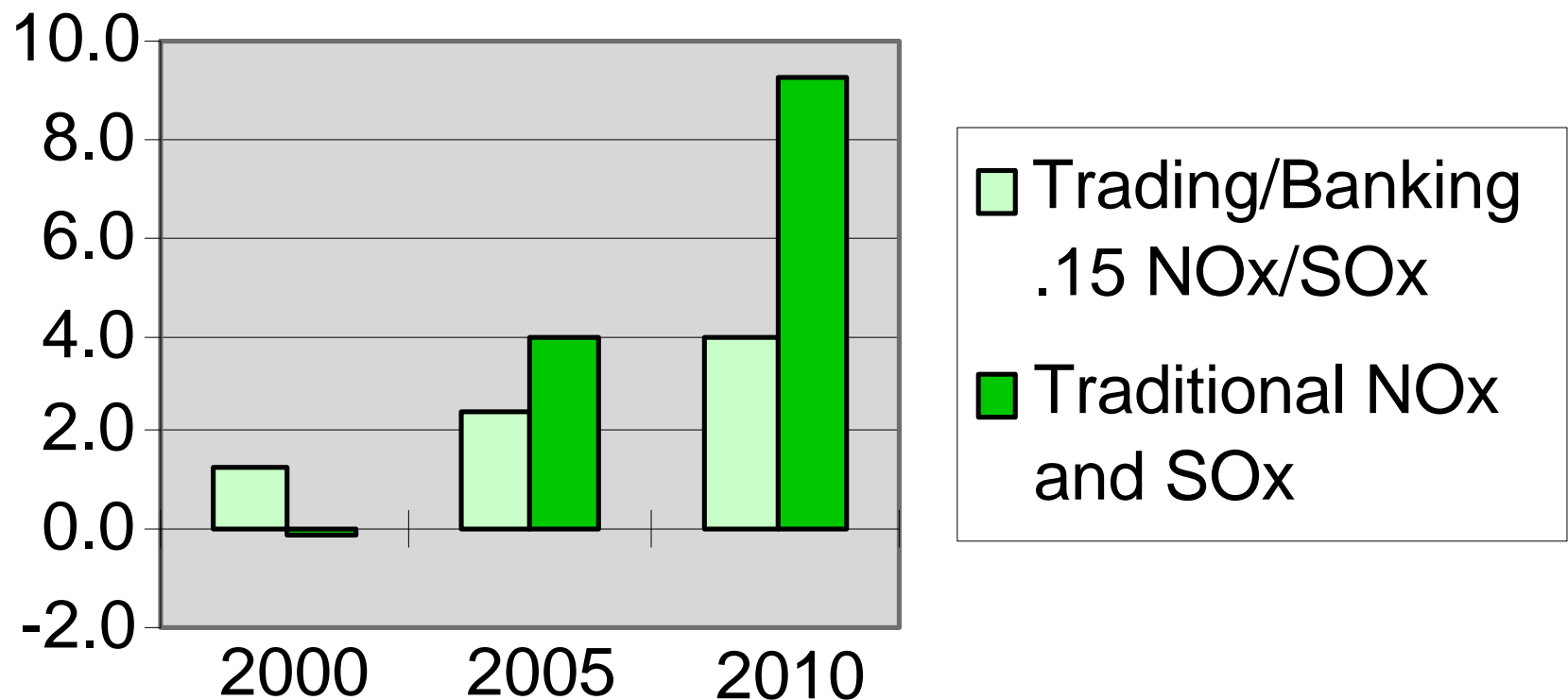


## SO<sub>x</sub> Emissions of the Traditional and 0.15 NO<sub>x</sub>/SO<sub>x</sub> 50% Options (million tons)





## Costs of Traditional vs Trading/Banking Approach to NO<sub>x</sub> and SO<sub>x</sub> (\$Billions)







# For More Information on The Acid Rain Program or CAPI

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Visit our Acid Rain Home Page:

<http://www.epa.gov/acidrain/ardhome.html>

Visit our CAPI Home Page:

<http://www.epa.gov/capi>