

# Reducing Power Plant Emissions: the Interstate Air Quality Rule



*Presentation for*

**CAAAC Spring Meeting**

**Office of Air and Radiation**

**March 24, 2003**



# Benefits of the Interstate Air Quality Rule (IAQR)

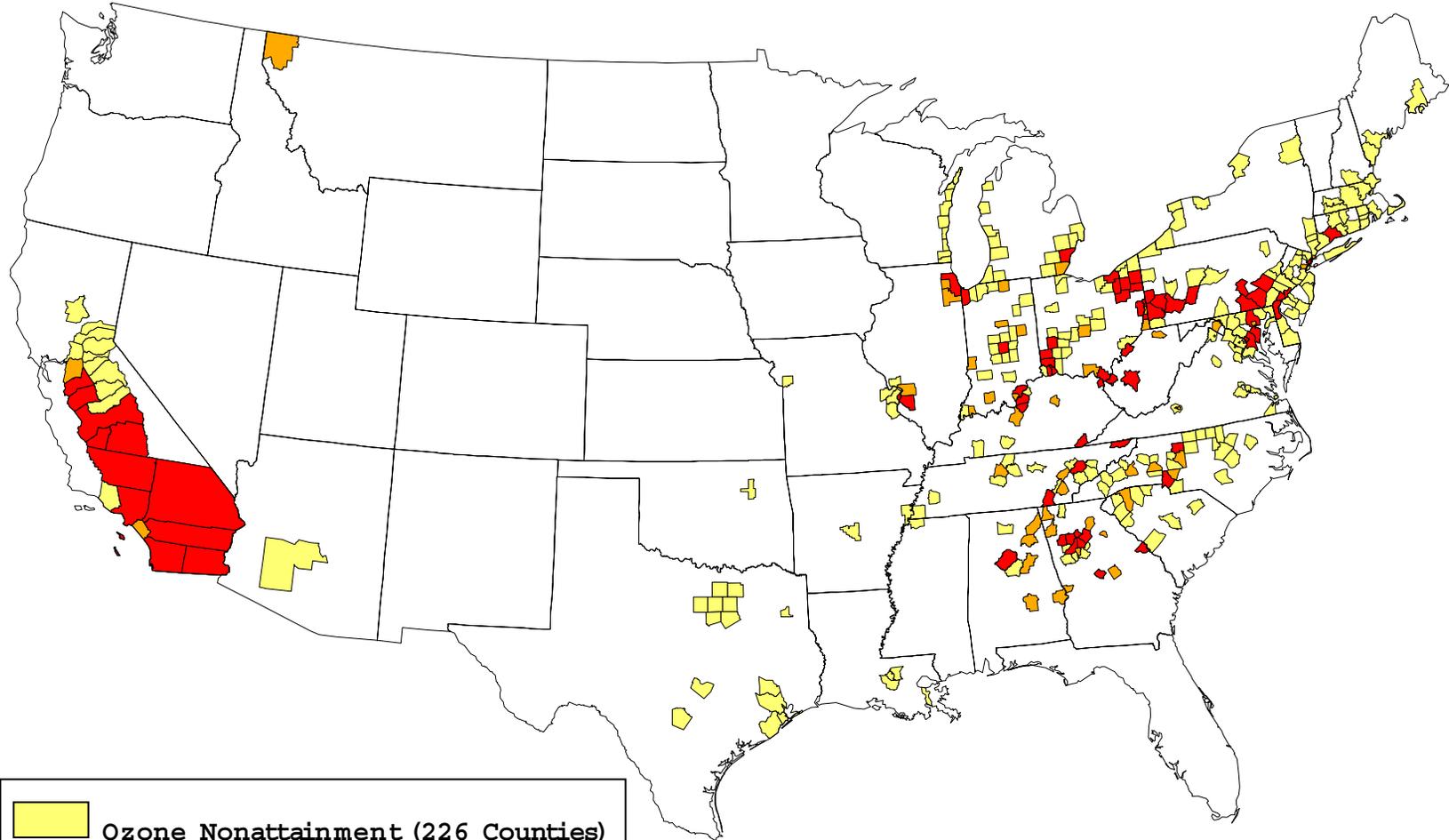
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- Helps cities and states in the East meet new, more stringent national ambient air quality standards for ozone and fine particles.
- Provides substantial health, welfare, and environmental benefits.
- Occurs while the economy continues to grow. US maintains both fuel diversity and low electricity prices.

...The most important step EPA can take now to improve air quality.

## Counties Exceeding the Ozone and PM<sub>2.5</sub> NAAQS in 2002

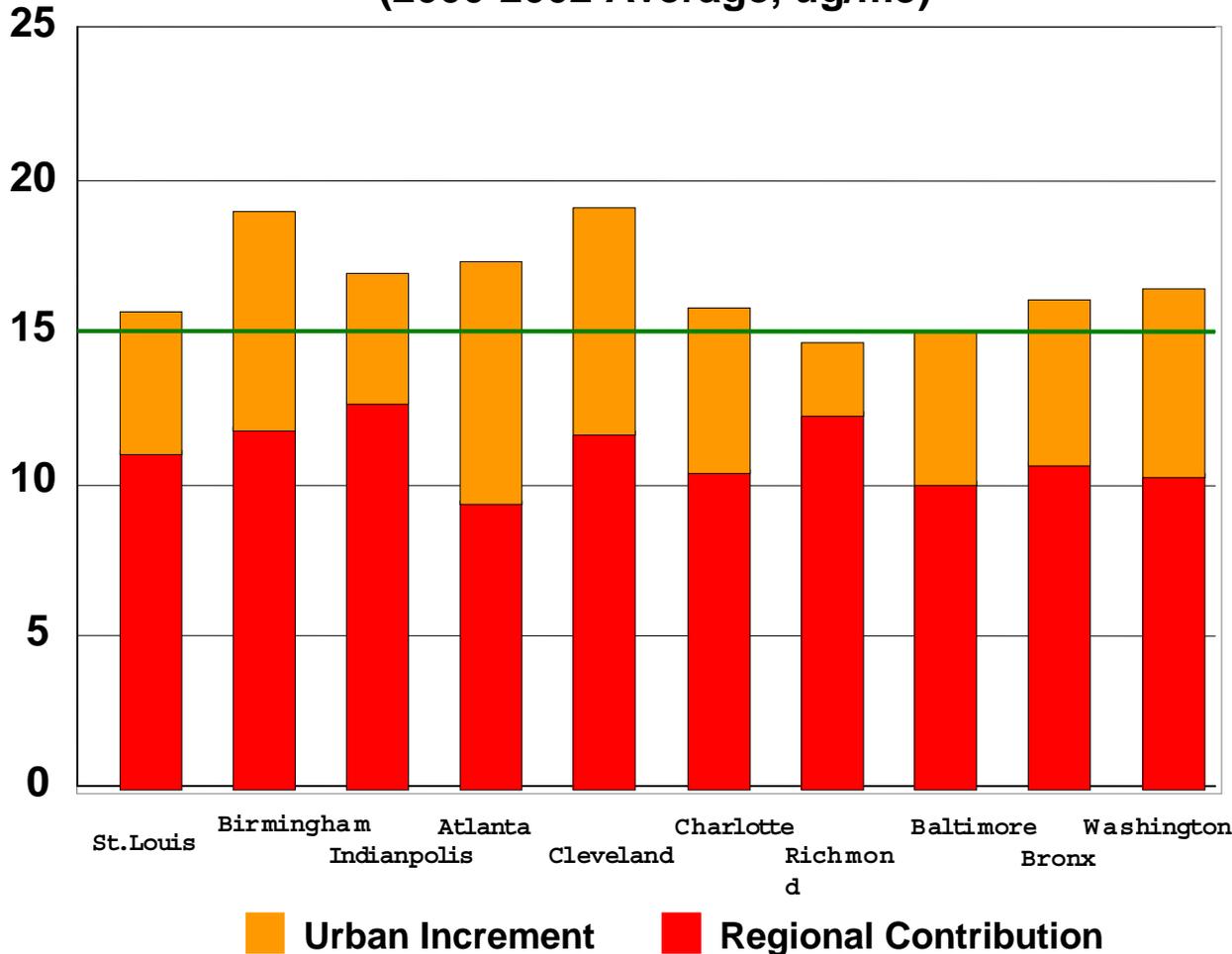
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-  Ozone Nonattainment (226 Counties)
-  PM<sub>2.5</sub> Nonattainment (49 Counties)
-  Both Nonattainment (71 Counties)

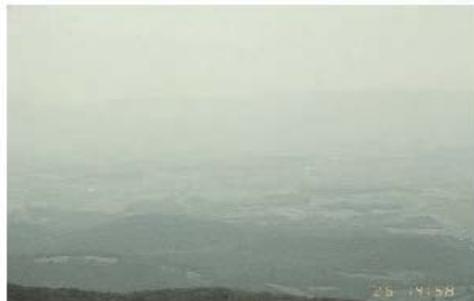
# Regional Emissions Contribute Significantly to Local Nonattainment Problems

Urban v. Regional Contribution to PM Concentrations  
(2000-2002 Average, ug/m3)



- Because emissions are often transported across state boundaries, both regional and local action is needed to address air quality issues.
- Federal action would significantly reduce the burden on state and local governments by addressing transport.

# Regional Haze and Visibility



**Shenandoah National Park under bad and good visibility conditions. The visual range in the top photo is 25 km while the visual range in the bottom photo is 180 km.**

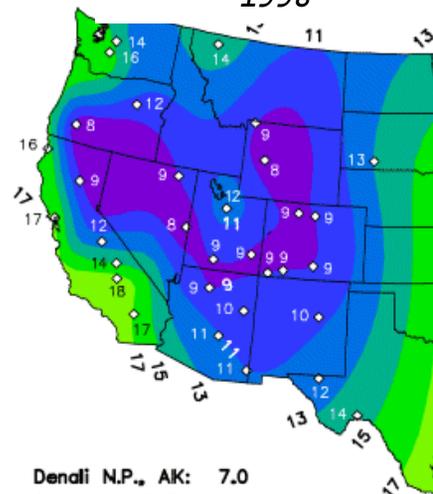


**Yosemite National Park under bad and good visibility conditions. The visual range in the top photo is 111 km while the visual range in the bottom photo is greater than 208 km.**

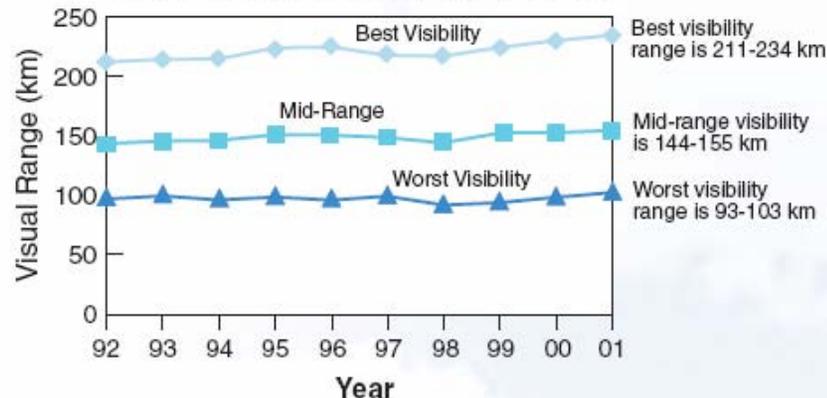


Source: 'Latest Findings on National Air Quality 2002.'

*Visibility in the West (Deciview) 1996-1998*



**Visibility Trends for Western U.S. Class I Areas, 1992-2001**

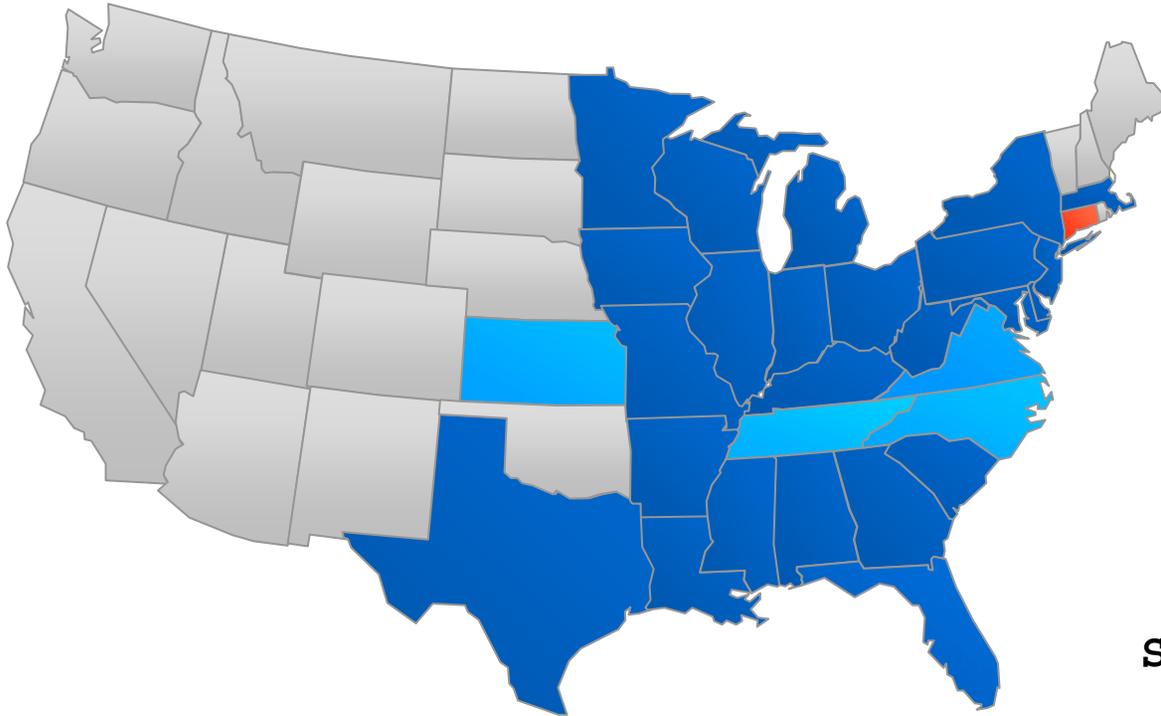


# IAQR: Key Elements

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- Program's **geographic coverage based on "significant contribution"** of State NOx and SO2 emissions to nonattainment of the 8-hour Ozone and PM2.5 standards.
- **Annual SO2 and NOx emissions caps** are set for region covered based on the determination that cap levels will be met **through highly cost-effective controls**.
  - Used the electric power sector to make determination.
  - Limits on construction labor for pollution control leads to **phased-in caps starting in 2010, and declining in 2015**.
  - Emissions caps are divided into **State NOx and SO2 budgets**.
- There is an **(optional) cap and trade program** based on successful Acid Rain trading program.
- Allows **states flexibility** on how to achieve the reductions, including which sources to control and whether to join the trading program.

# IAQR: Affected Region and Emission Caps



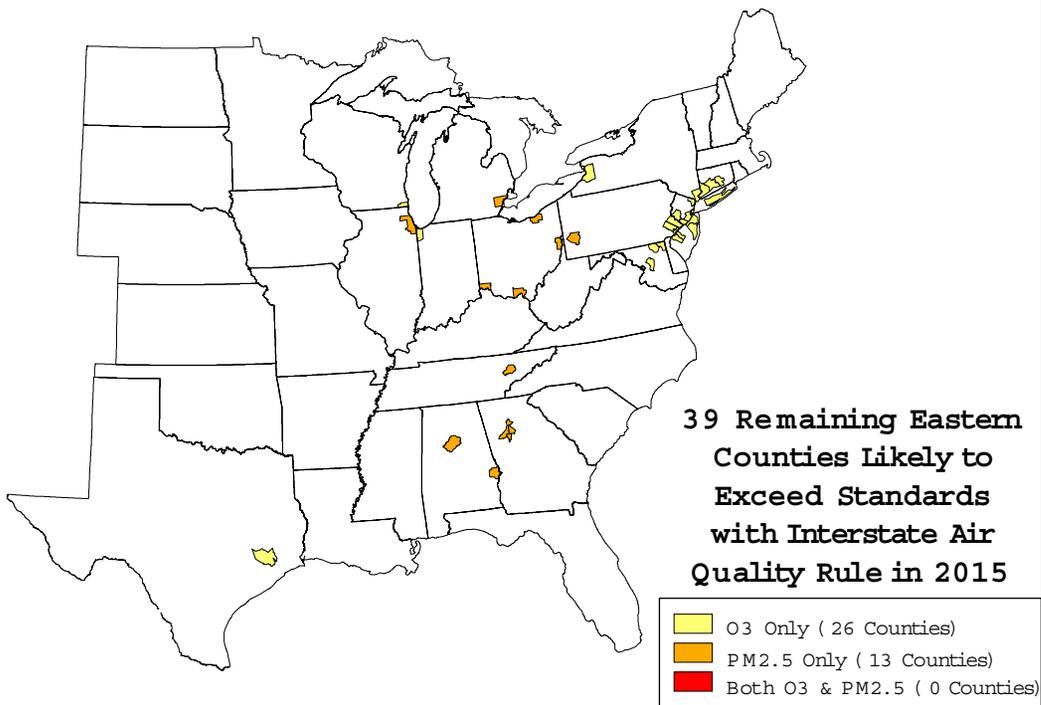
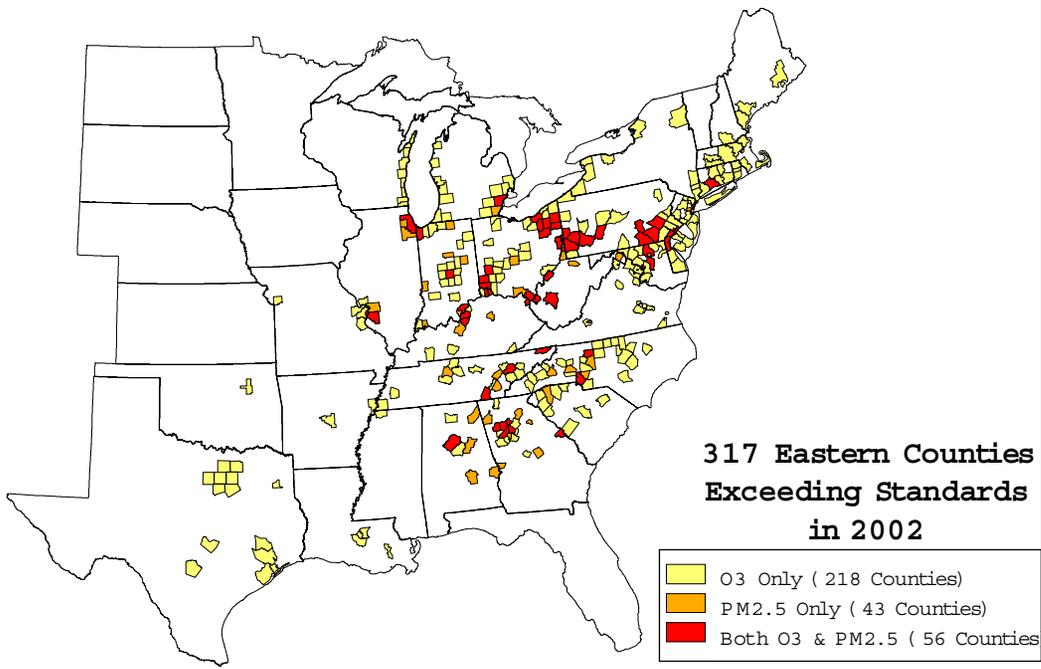
-  States controlled for both SO<sub>2</sub> and NO<sub>x</sub>
-  States controlled for ozone season NO<sub>x</sub> only
-  States not covered under the IAQR rule

## Emissions Caps\*

(million tons)

	2010	2015
<b>SO<sub>2</sub></b>	3.9	2.7
<b>NO<sub>x</sub></b>	1.6	1.3

*\*For the affected region.*



## Ozone and PM

**IAQR with Other Clean Air Programs, Brings Cleaner Air**

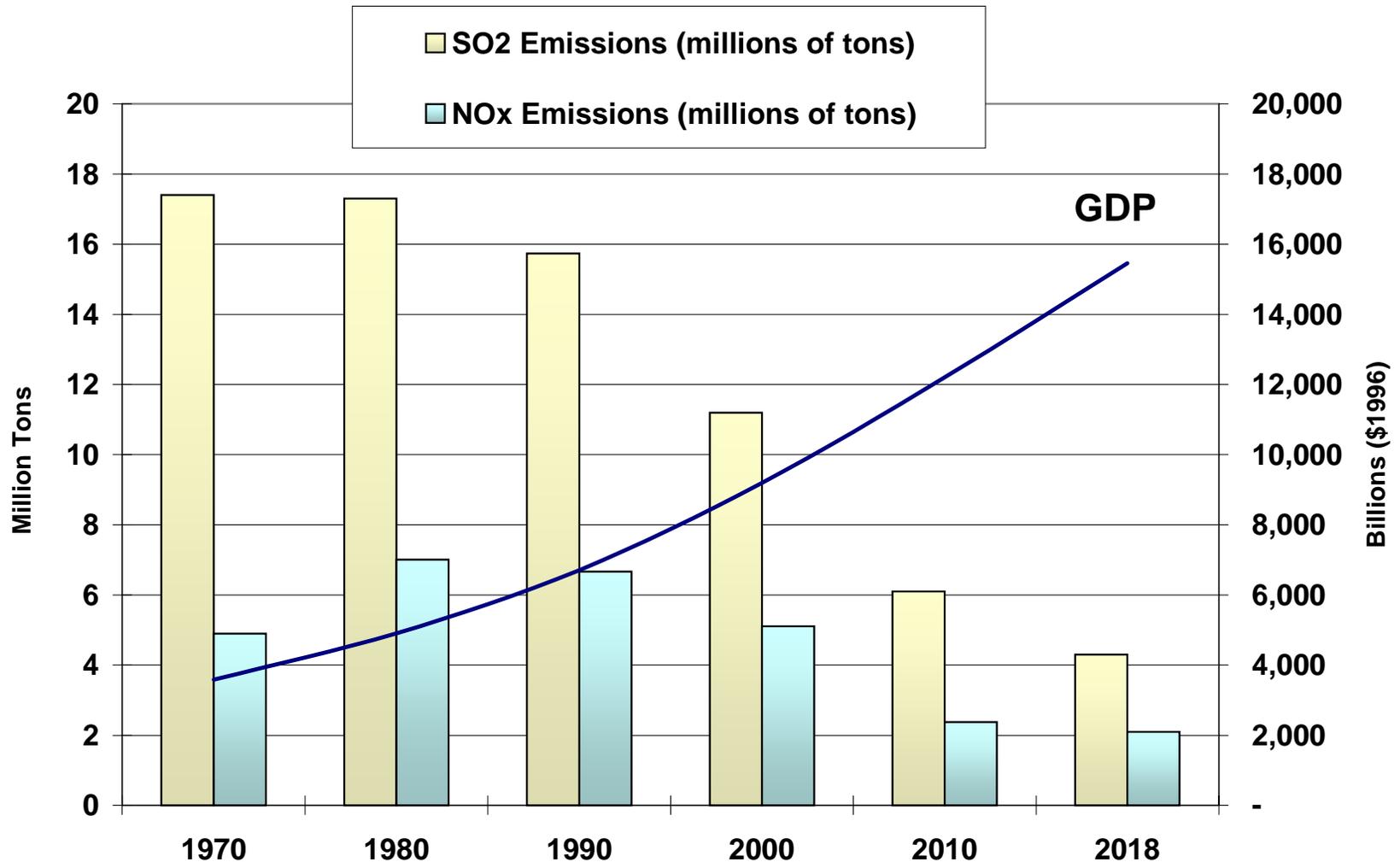
PM2.5 standard = 15  $\mu\text{g}/\text{m}^3$   
 8-hour Ozone Standard = .08 ppm

# Benefits at a Reasonable Cost

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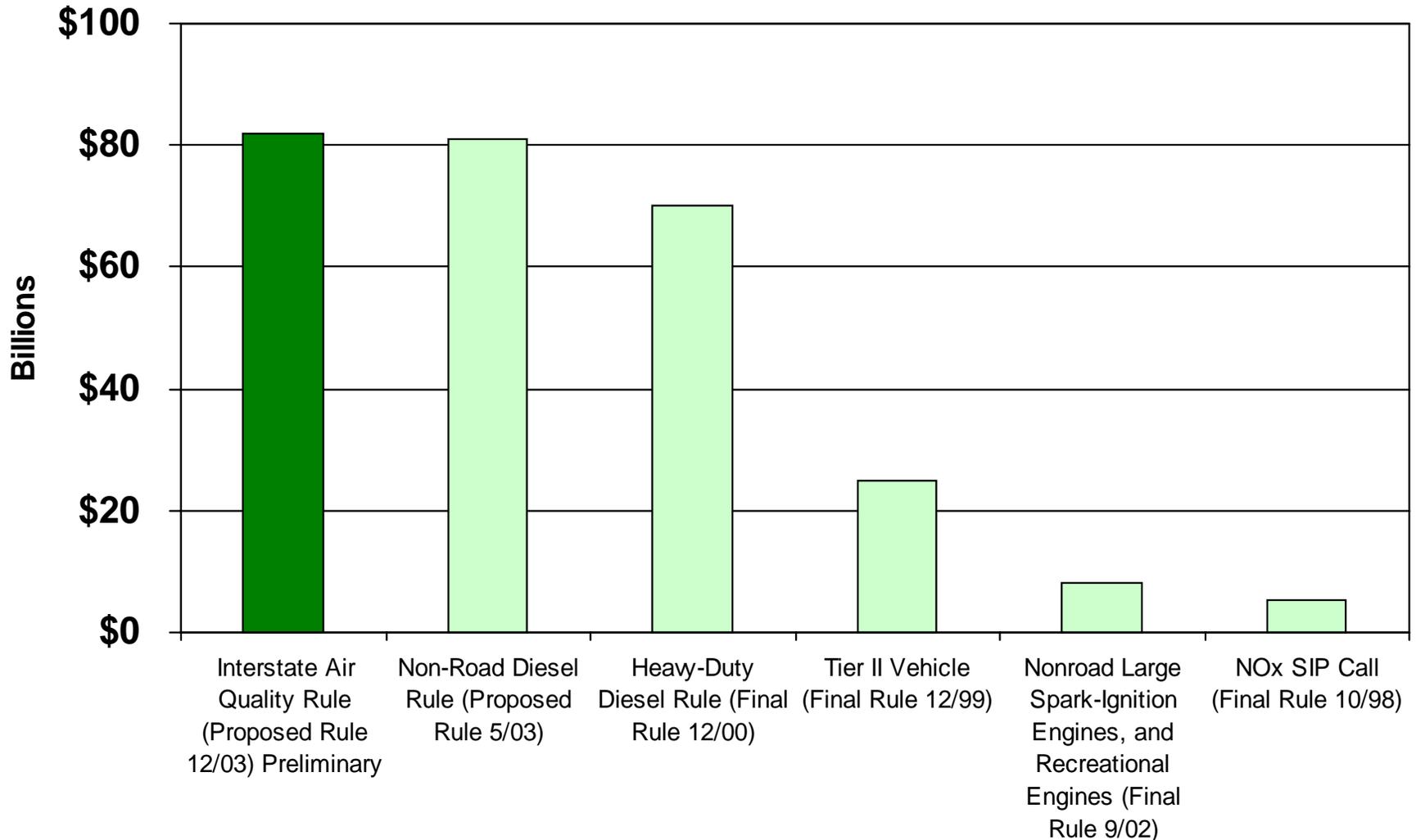
- 28 more counties would attain the  $PM_{2.5}$  standard and 8 more counties would attain the ozone standard in 2015 (compared to Base Case).
- Reduced fine particle and ozone exposures begin immediately and result in \$82.4 billion in annual health benefits in 2015, including:
  - 13,000 avoided premature deaths;
  - 6,900 fewer cases of chronic bronchitis;
  - 18,000 fewer non-fatal heart attacks;
  - 240,000 fewer asthma exacerbations;
  - 9.3 million fewer days with respiratory illnesses and symptoms;
  - 22,500 fewer hospitalizations and ER visits; and
  - 1.7 million fewer absences from work and school.
- In 2015, annual visibility benefits would be \$1.4 billion for improvements in Southeastern national parks and forests.
- Improve the quality of lakes, streams, and estuaries.
- Additional health & environmental benefits will result for the rule, but cannot be monetized (e.g., co-benefits of mercury reductions).
- **Benefits far exceed costs – over \$22 benefits for every dollar of costs.**
  - Annual costs by 2015 are \$3.7 billion

# Economic Growth Will Continue



Sources: 1970 - 1999 emissions data are from the National Air Pollutant Emissions Trend Report (EPA, March 2000). Projections for SO<sub>2</sub>, NO<sub>x</sub> and mercury are derived from the Integrated Planning Model (IPM). GDP data for 1970 - 2000 is from the Bureau of Economic Analysis, U.S. Department of Commerce. The GDP projection for 2010 is from OMB's Analytical Perspectives Report for 2003, Table 2-1. The 2010 to 2020 projection follows EIA's assumptions in AEO 2001 of 3% growth per year.

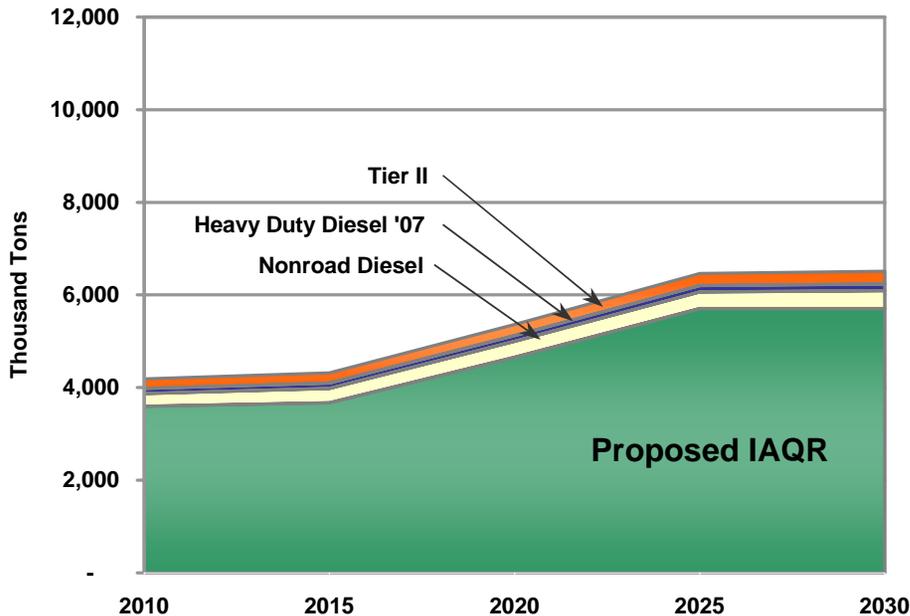
# Interstate Air Quality Rule and Other Major Air Pollution Rules Since 1990: Annual Benefits at Full Implementation



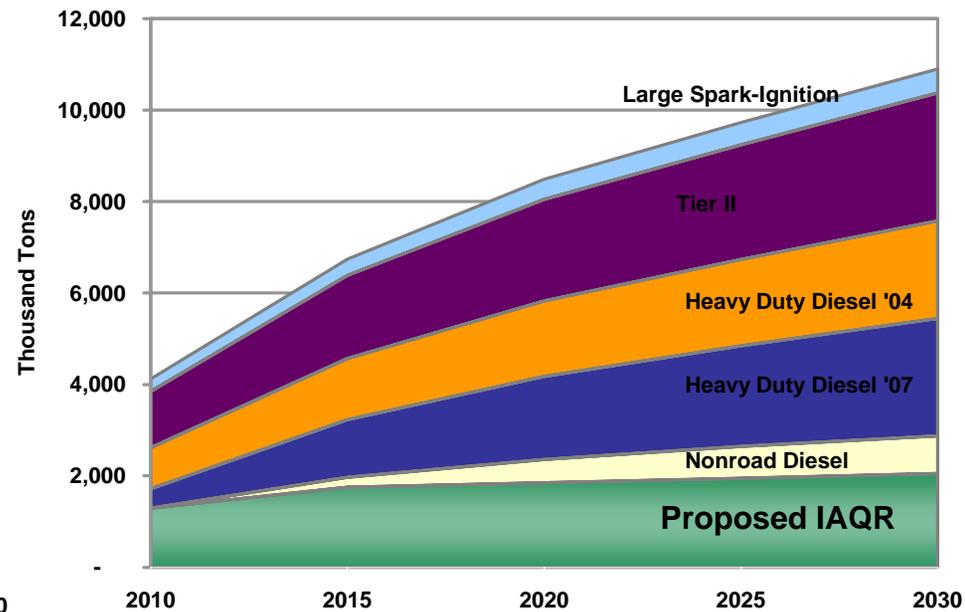
Notes: NOx SIP Call benefits are inflated from 1990 dollars and represent the higher range of projected final rule benefits. Full implementation for mobile source rules is 2030. Full implementation for the IAQR is 2020.

# Projected Emission Reductions of SO<sub>2</sub> and NO<sub>x</sub> under the Proposed IAQR and Recent Mobile Source Rules

## Annual SO<sub>2</sub> Reductions from Major EPA Rules



## Annual NO<sub>x</sub> Reductions from Major EPA Rules



Note: Mobile source rules also result in reductions of VOCs and PM. The IAQR also lowers mercury emissions. Projections for the proposed IAQR are from the Integrated Planning Model. Projections for mobile source rules are from either the MOBILE, NONROAD, MOVES, Fuels, or CALINE models. Notably, the Title IV and NO<sub>x</sub> SIP call programs have also lead to significant power sector emissions reductions for SO<sub>2</sub> and NO<sub>x</sub>.

# Perspective on Approach

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- Administration prefers Clear Skies.
  - Provides substantial health and environmental benefits with certainty, less complexity, and reasonable economic impacts.
- However, the Interstate Air Quality Rule will:
  - Help cities and states in the East meet new, more stringent national ambient air quality standards for ozone and fine particles.
  - Provide substantial health, welfare, and environmental benefits.
  - Occur while the economy continues to grow. US maintains both fuel diversity and low electricity prices. Benefits gained at a very reasonable cost.

***...It's the most important step EPA can take now to improve air quality...***

# Issues for Discussion

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1. Are the air emissions caps set at the right levels of control?
2. Are the dates of the annual phased-in air emissions caps well-matched with helping areas reach attainment?
3. Should we address regional haze requirements and establish a national cap and trading program to do so?
4. Can a regional or national trading program be sufficient to satisfy BART requirements?
5. What should local areas be required to do while waiting for the reductions from a regional or national program?