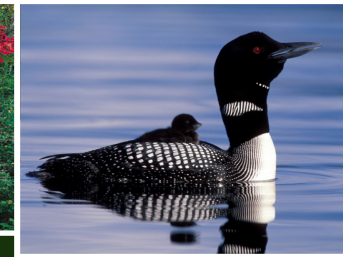




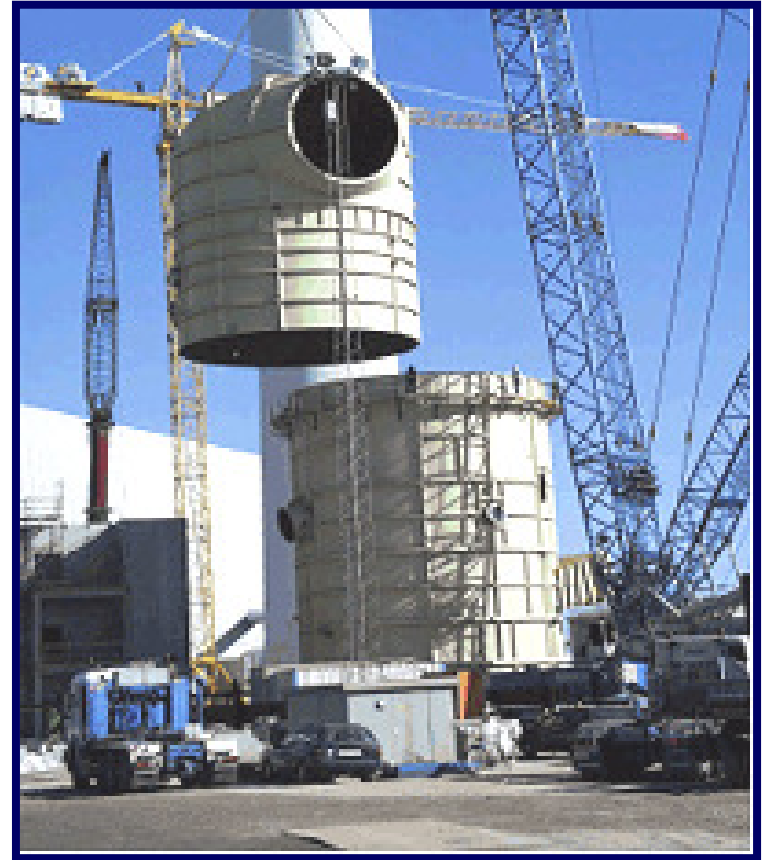
Utility and Industrial Boiler MACT: *“Lights, Camera, Action!”*



Robert J. Wayland, Ph.D.
Leader, Energy Strategies Group
Office of Air Quality Planning and Standards
U.S. Environmental Protection Agency
October 15, 2009

Overview

- **Overview of the Power Sector**
 - What's on the horizon?
- **Current Emissions from the Power Sector**
 - Have we made any progress?
- **Update on the Litigation response to the Clean Air Interstate Rule (CAIR) and the Clean Air Mercury Rule (CAMR)**
- **Update on the Status of the Industrial, Commercial and Institutional (ICI) Boiler MACT and Commercial, Institutional Solid Waste Incinerator (CISWI) Regulations**
- **Next Steps**

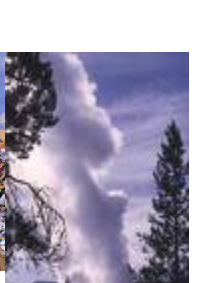


Electricity Generation in the United States



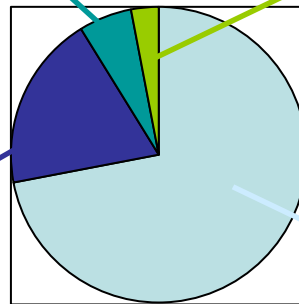
Hydro (6%):

- Climate Change



Renewables (3%):

- Biomass
- Energy Recovery
- Geothermal
- Wind/Solar



- Fossil
- Nuclear
- Hydro
- Renewable



Nuclear (19%):

- National Security



Transmission Grid:

- Aging infrastructure
- Smart Grid



Fossil (72%):

- Coal (50%)
- Natural Gas (21%)
- Oil (2%)

Regulatory and Legislative Impacts on the Industrial and Power Industrial Sectors

**National Standards
Under the
Clean Air Act**

**Other Environmental
Programs
NPDES, RCRA**

**Clean Air
Transport Rule**

**Renewable Energy
Policies, Waste to
Energy**

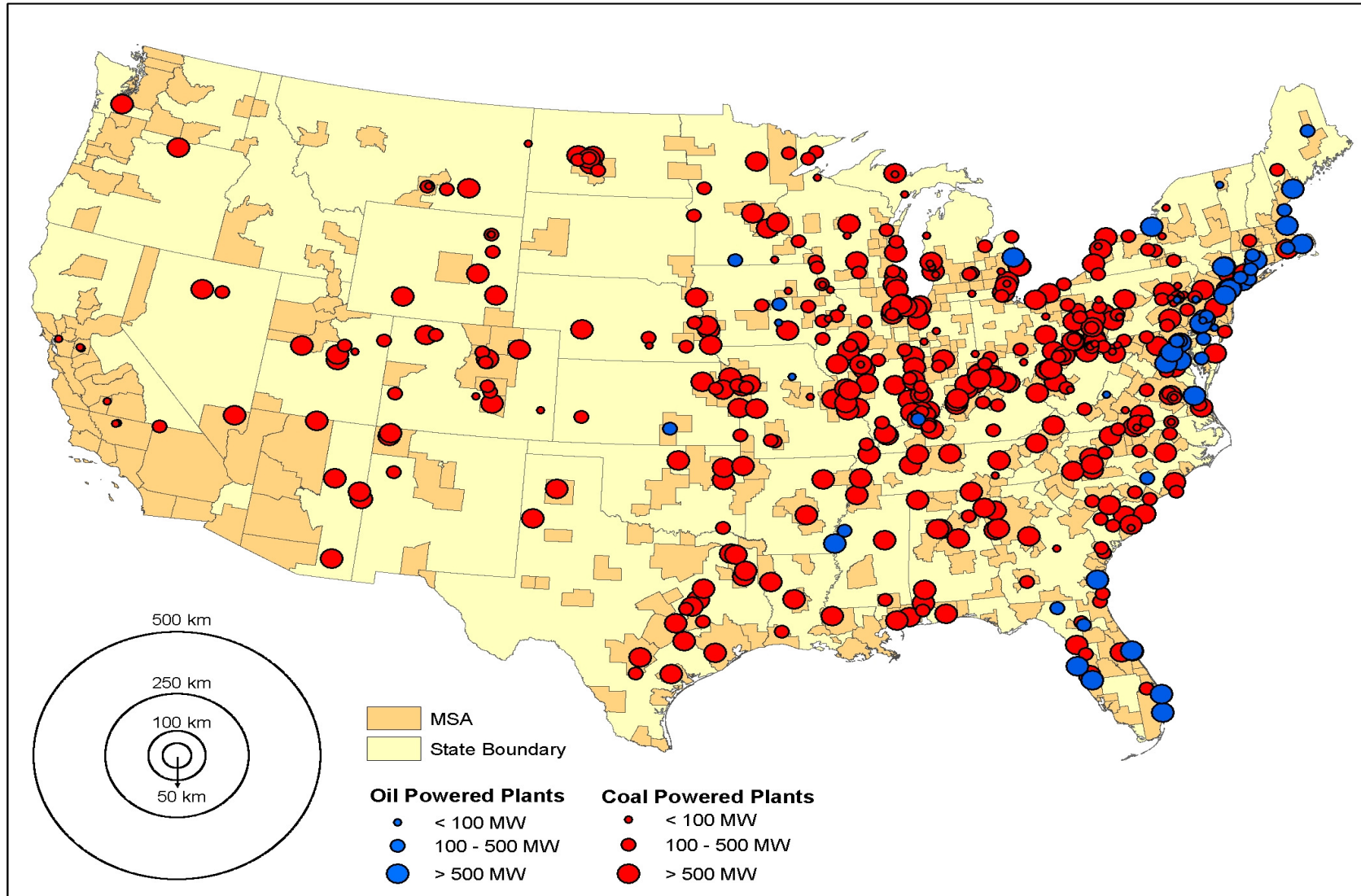
**Legislative Proposals
ACES, Carper 3-P**

**Permit Requirements
NSR, PSD, Title V**

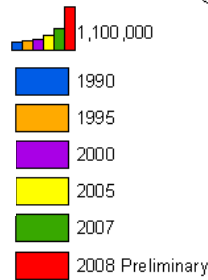
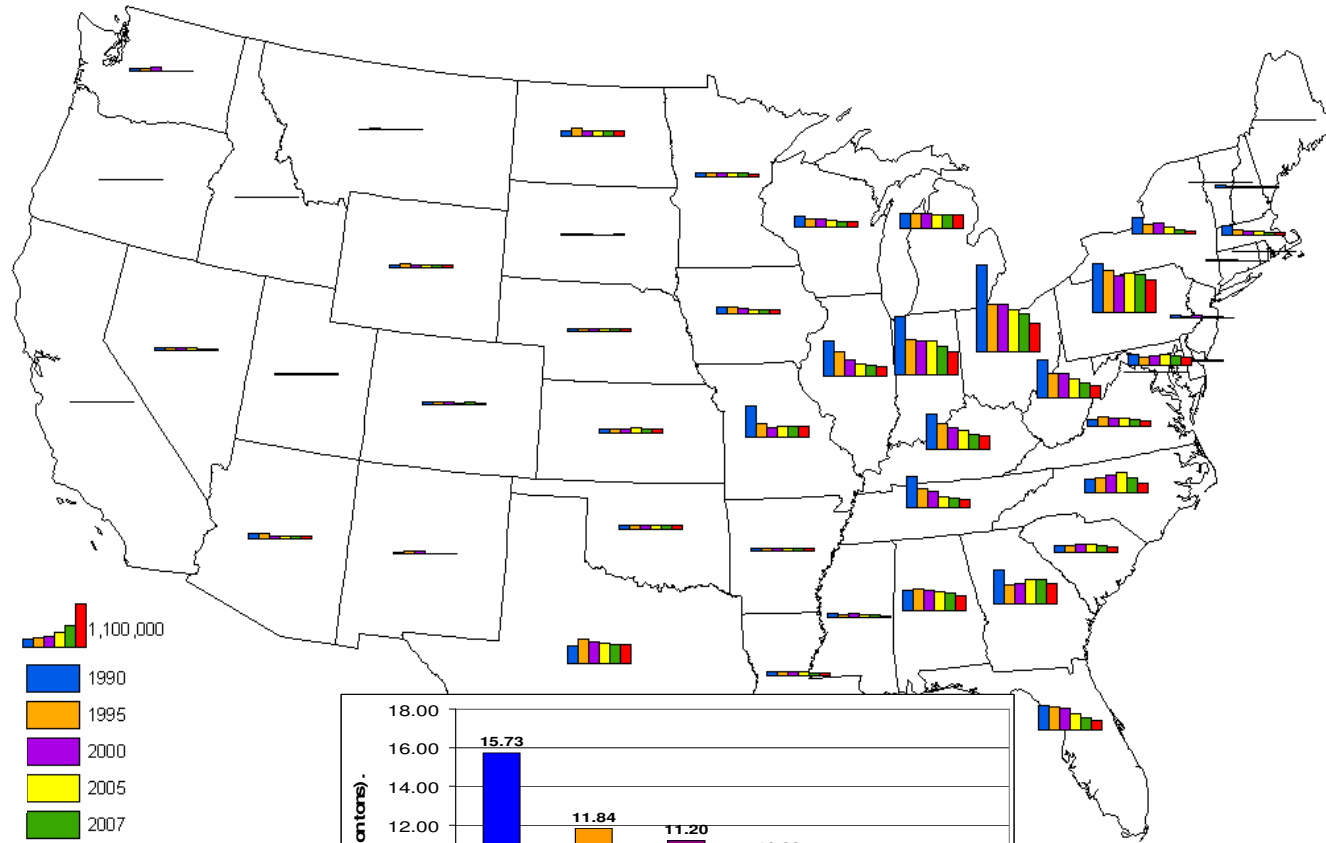
**Other Clean Air Act
Requirements
NAAQS, Regional Haze**



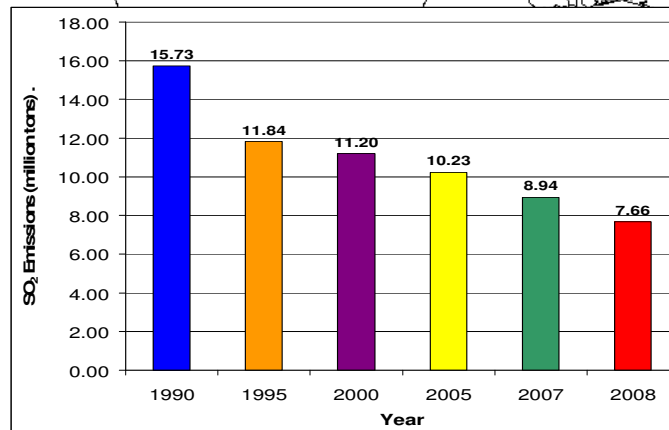
U.S. Coal and Oil-Fired Plants



SO₂ Emissions Declined from 1990-2008

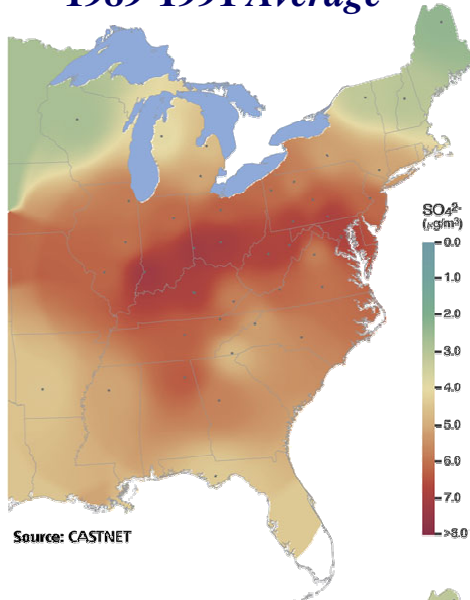


Scale: Largest bar equals 2.2 million tons of SO₂ emissions in Ohio, 1990
Source: EPA, 2009



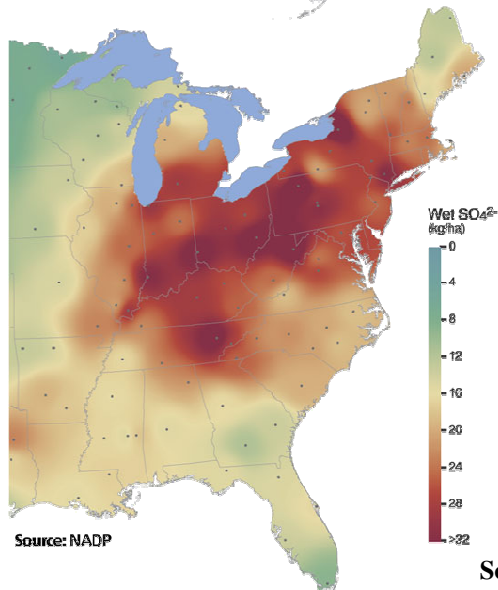
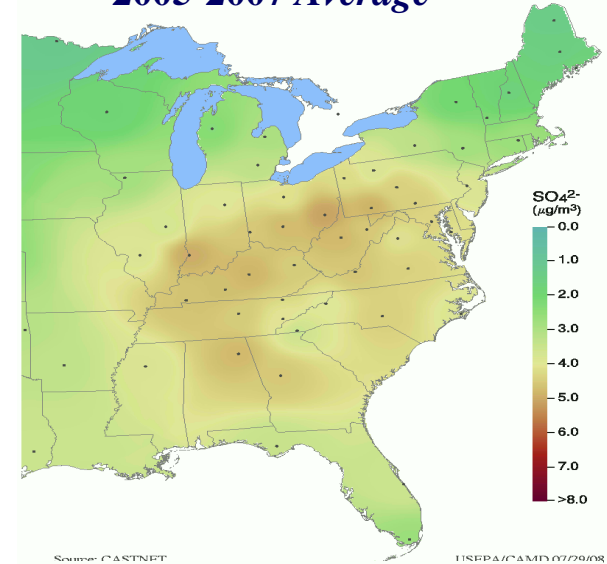
Fine Particle Pollution (Sulfate) and Acid Rain (Sulfur) Decreased

1989-1991 Average

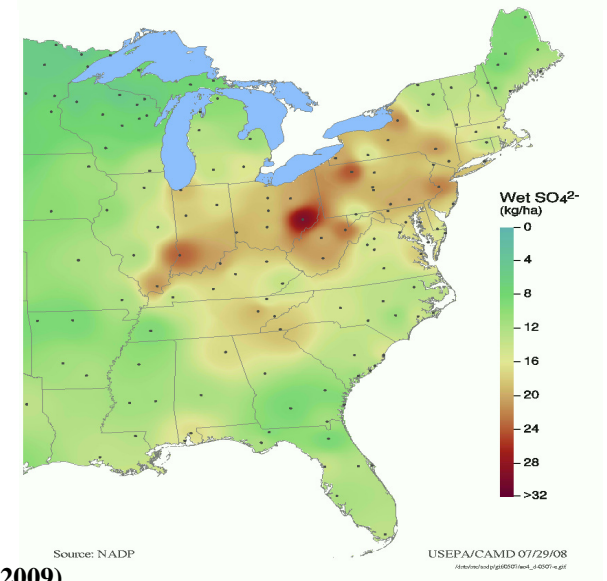


Fine Particles
Annual Mean Ambient
Sulfate Concentration

2005-2007 Average

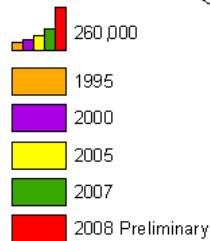
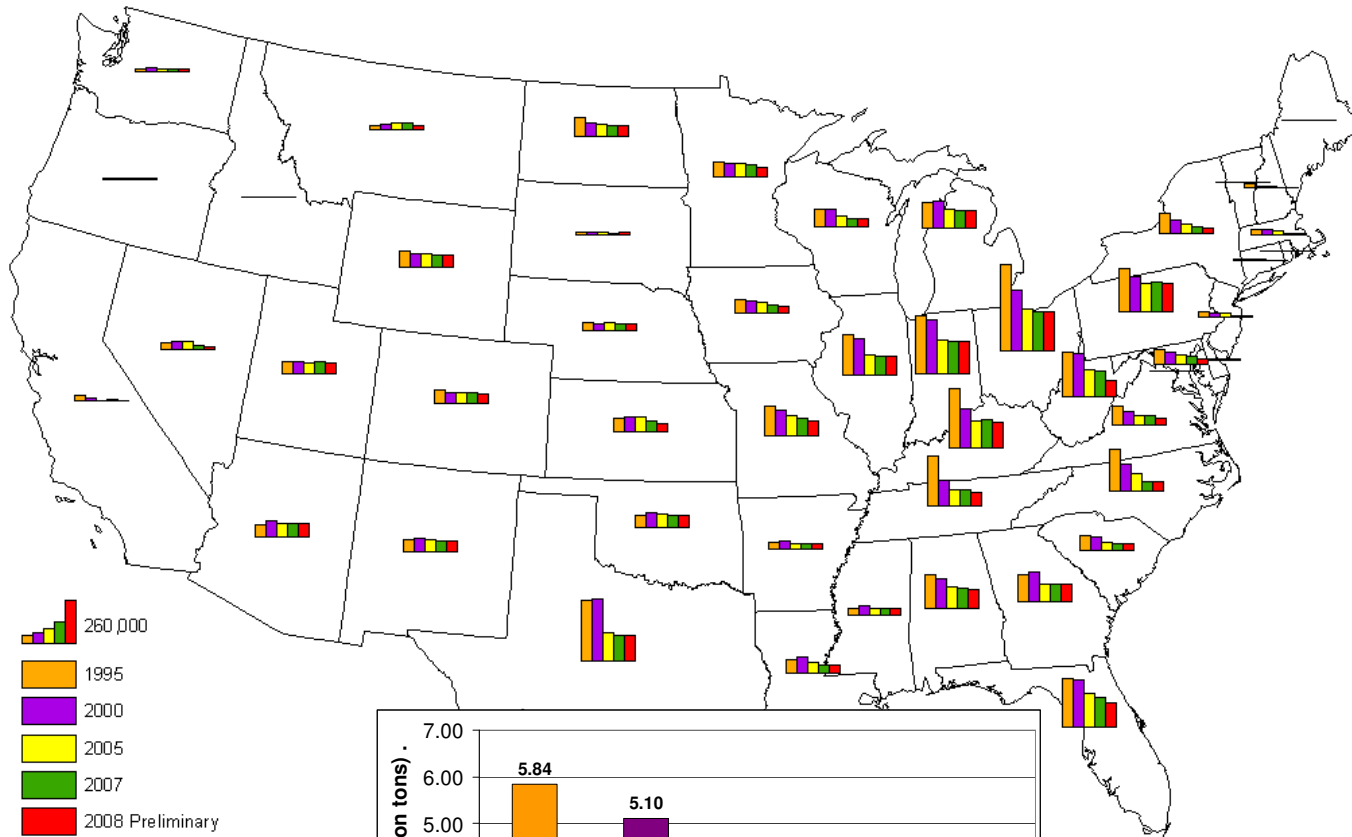


Acid Rain
Annual Mean Wet Sulfate
Deposition

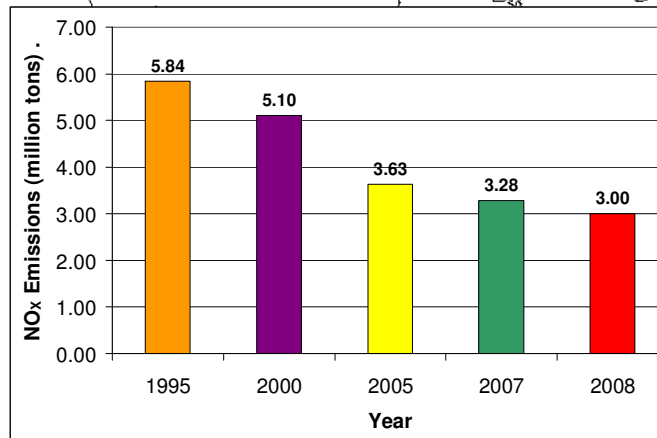


Source: EPA's Office of Atmospheric Programs (2009)

NO_x Emissions Declined from 1995-2008

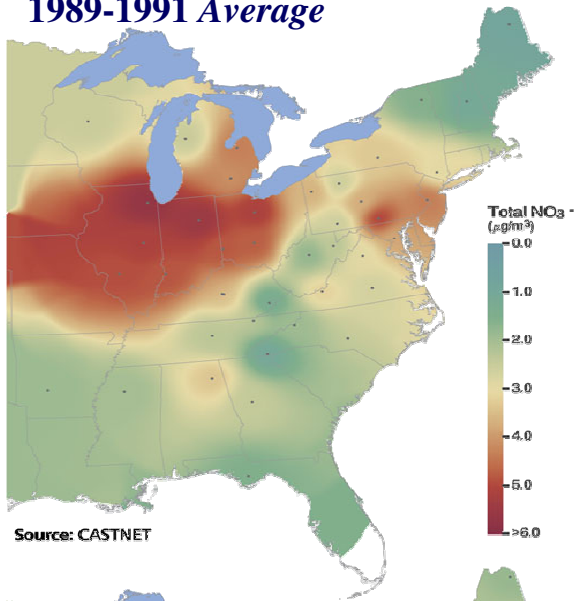


Scale: Largest bar equals 529 thousand tons of NO_x emissions in Ohio, 1995
Source: EPA, 2009



Fine Particle Pollution (Nitrate) and Acid Rain (Nitrogen) Decreased

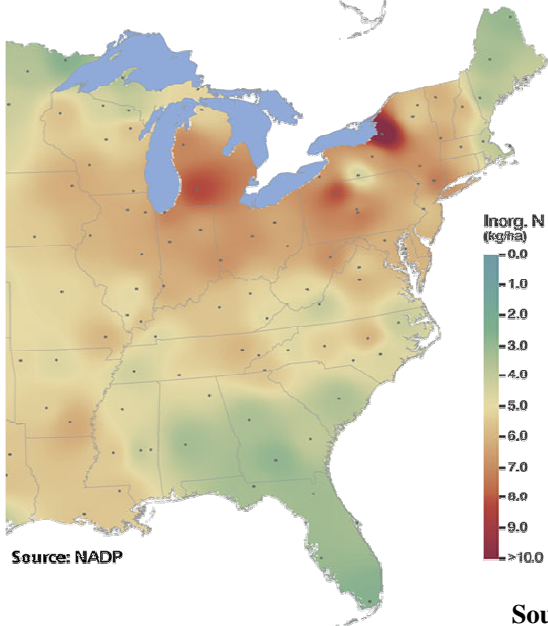
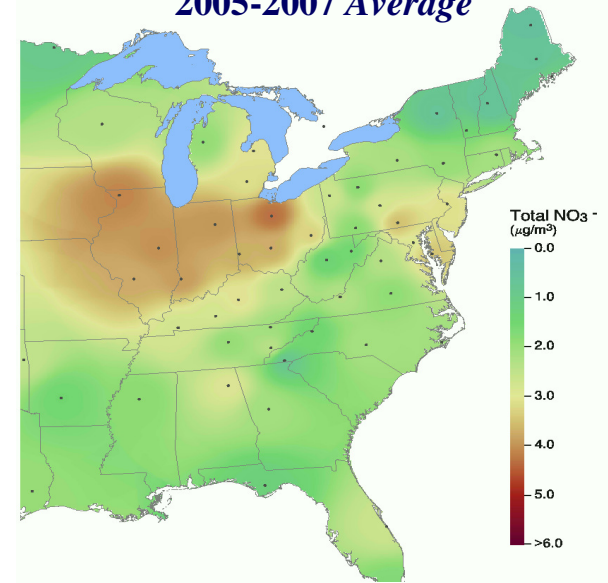
1989-1991 Average



Fine Particles

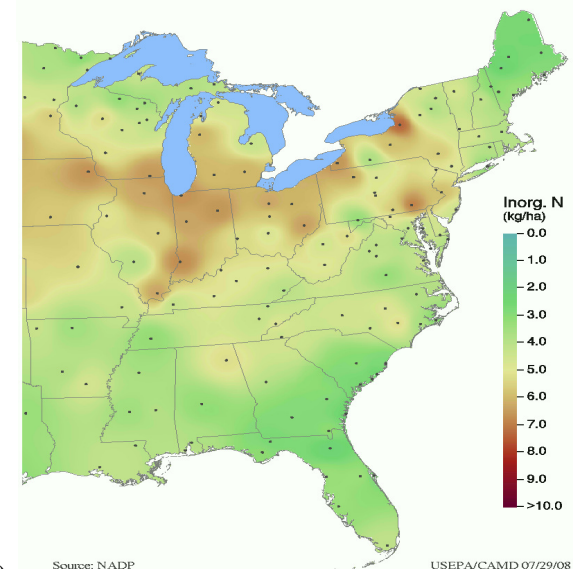
Annual Mean Total Nitrate
Ambient Concentration

2005-2007 Average



Acid Rain

Annual Mean Wet Inorganic
Nitrogen Deposition

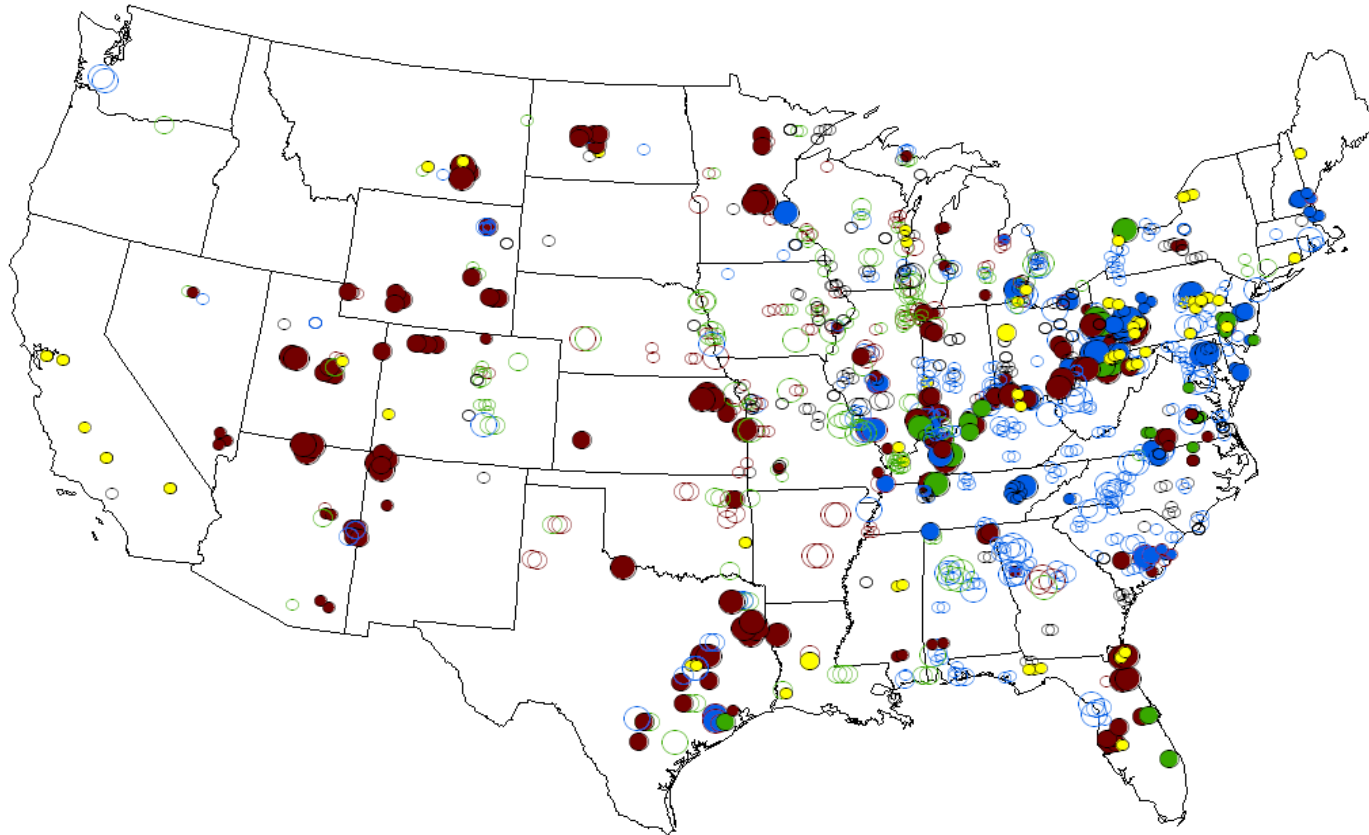


Source: EPA's Office of Atmospheric Programs (2009)

Source: NADP

USEPA/CAMD 07/29/08
http://nadp.epa.gov/60501/comp_+0501+.gif

2000 Coal Controls for SO₂ and NO_x



Scrubber and SCR/SNCR Scrubber

- Under 300 MW
- 300 MW to 600 MW
- Over 600 MW

- Under 300 MW
- 300 MW to 600 MW
- Over 600 MW

SCR/SNCR

- Under 300 MW
- 300 MW to 600 MW
- Over 600 MW

FBC/IGCC

- Under 300 MW
- 300 MW to 600 MW
- Over 600 MW

LNB and Under 1.0 lb SO₂/mmBtu Under 1.0 lb SO₂/mmBtu

- Under 300 MW
- 300 MW to 600 MW
- Over 600 MW

LNB

- Under 300 MW
- 300 MW to 600 MW
- Over 600 MW

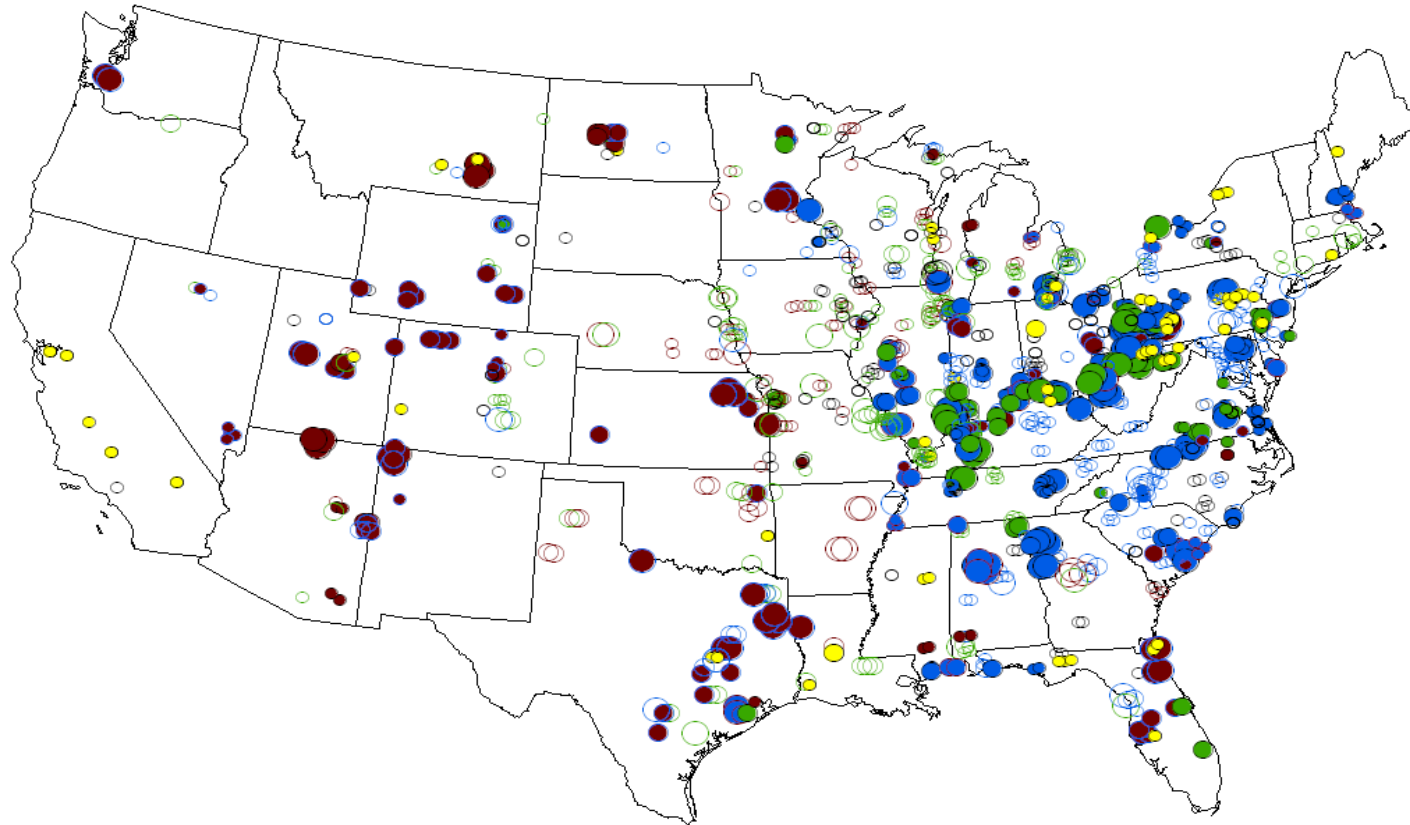
None

- Under 300 MW
- 300 MW to 600 MW
- Over 600 MW

Virtually all coal-fired units have electrostatic precipitators, baghouses, or other advanced controls for high levels of particulate removal.

Source: Updated NEEDS and Data & Maps, EPA, 2009

2005 Coal Controls for SO₂ and NO_x



Scrubber and SCR/SNCR Scrubber

- Under 300 MW
- 300 MW to 600 MW
- Over 600 MW

- Under 300 MW
- 300 MW to 600 MW
- Over 600 MW

SCR/SNCR

- Under 300 MW
- 300 MW to 600 MW
- Over 600 MW

FBC/IGCC

- Under 300 MW
- 300 MW to 600 MW
- Over 600 MW

LNB and Under 1.0 lb SO₂/mmBtu Under 1.0 lb SO₂/mmBtu

- Under 300 MW
- 300 MW to 600 MW
- Over 600 MW

- Under 300 MW
- 300 MW to 600 MW
- Over 600 MW

LNB

- Under 300 MW
- 300 MW to 600 MW
- Over 600 MW

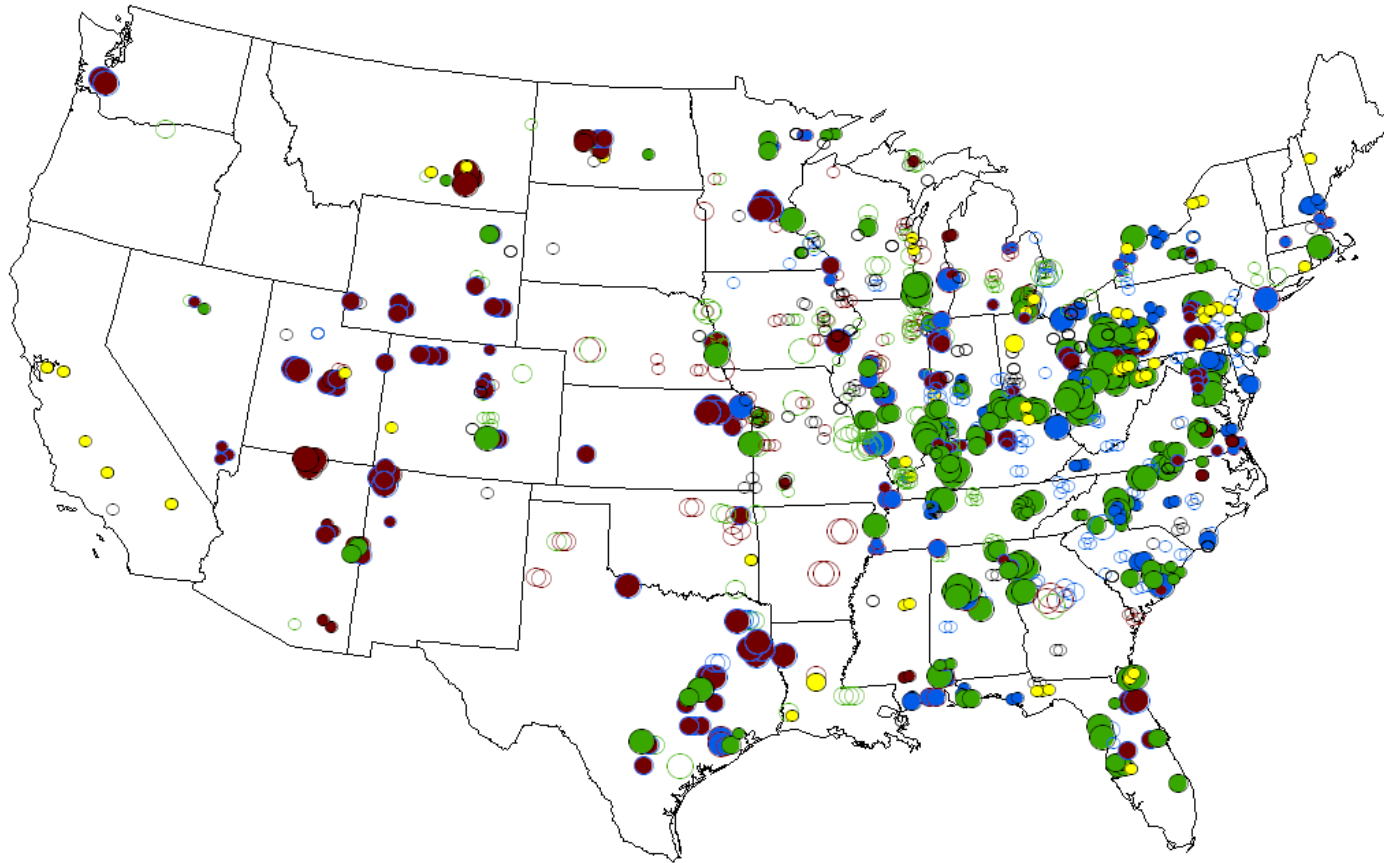
None

- Under 300 MW
- 300 MW to 600 MW
- Over 600 MW

Virtually all coal-fired units have electrostatic precipitators, baghouses, or other advanced controls for high levels of particulate removal.

Source: Updated NEEDS and Data & Maps, EPA, 2009

2010 Coal Controls for SO₂ and NO_x



Scrubber and SCR/SNCR Scrubber

- Under 300 MW
- 300 MW to 600 MW
- Over 600 MW

- Under 300 MW
- 300 MW to 600 MW
- Over 600 MW

SCR/SNCR

- Under 300 MW
- 300 MW to 600 MW
- Over 600 MW

FBC/IGCC

- Under 300 MW
- 300 MW to 600 MW
- Over 600 MW

LNB and Under 1.0 lb SO₂/mmBtu Under 1.0 lb SO₂/mmBtu

- Under 300 MW
- 300 MW to 600 MW
- Over 600 MW

- Under 300 MW
- 300 MW to 600 MW
- Over 600 MW

LNB

- Under 300 MW
- 300 MW to 600 MW
- Over 600 MW

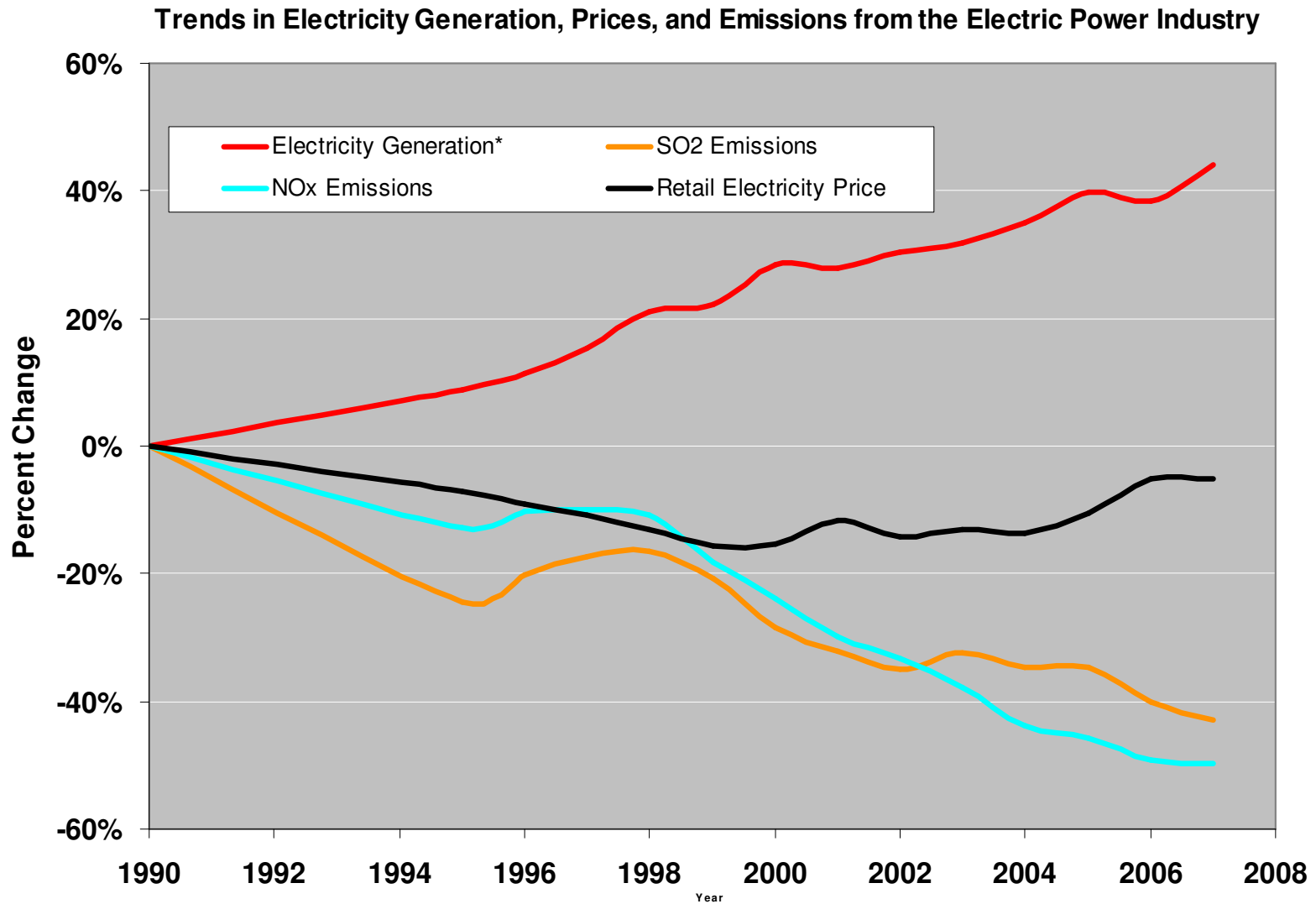
None

- Under 300 MW
- 300 MW to 600 MW
- Over 600 MW

Virtually all coal-fired units have electrostatic precipitators, baghouses, or other advanced controls for high levels of particulate removal.

Source: Updated NEEDS and Data & Maps, EPA, 2009

Pollution Decreased While Electricity Use Increased



Source: EPA (Emissions) and EIA (Generation and Price)

Source: EPA's Office of Atmospheric Programs (2009)

Utility MACT - Status



- **02/08/2008** – D.C. Circuit Court of Appeals vacated the Section 112(n) Revision Rule and CAMR
- **10/17/2008** – U.S. Government filed a petition for writ of certiorari with the U.S. Supreme Court
- **12/18/2008** – Mandatory duty suit filed by *American Nurses Assn., et al.*, for failure to establish MACT standards for coal- and oil-fired electric generating units by 12/20/2002
- **02/06/2009** – U.S. Government moves to withdraw its petition for writ of certiorari
- **02/23/2009** – U.S. Supreme Court denies industry petition for *writ of certiorari* and grants U.S. Government's request to withdraw its petition



Utility MACT Status

- **Have entered into confidential settlement negotiations with plaintiffs on mandatory duty suit**
 - Response provided to the Court on 07/27/2009
 - No response yet
 - If agreement is reached, statute requires a section 113(g) notice and comment process via the Federal Register

- **Announced in the Federal Register on 07/02/2009 (74 FR 31725) that EPA will be seeking OMB approval of a section 114 information collection request (ICR)**
 - 60-day public comment period on this draft ended 08/31/2009
 - Next steps
 - Review comments received and revise ICR
 - Provide second period of public comment (30 days)
 - OMB review and approval
 - Submit ICR to industry

Utility ICR - Summary

- **Current draft version requires**
 - Update of “what you look like” information (e.g., fuels utilized, controls installed, etc.)
 - Available data obtained over past 5 years
 - All pollutants
 - Includes CEM data
 - 1,325 units required to respond

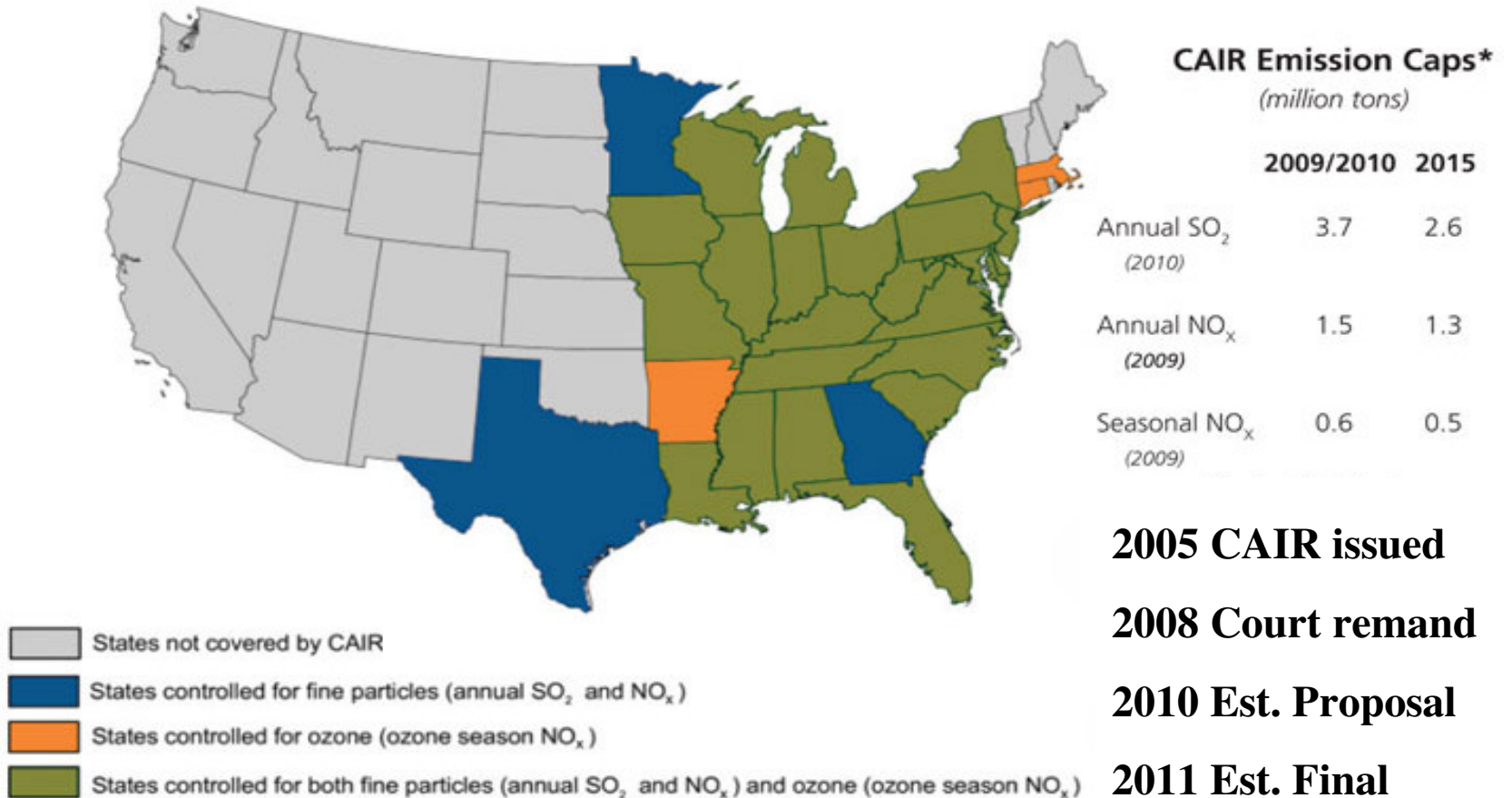
- **880 units proposed to conduct required testing for variety of pollutants to establish surrogacy relationships and develop MACT floor limits**
 - 217 coal-fired units for acid gas HAP (e.g. HCl/HF/HCN)
 - 149 coal-fired units for dioxin/furan organic HAP
 - 184 coal-fired units for non-dioxin/furan organic HAP
 - 214 coal-fired units for metallic HAP (e.g., Hg, As, Se, PM (fine+total) radionuclides)
 - 116 oil-fired units for all HAP (i.e., acid gas, organic, metallic)

- **Final ICR subject to change as a result of comments received and OMB review**

Clean Air Interstate Rule (CAIR)

- **On appeal, the D.C. Circuit Court remanded, rather than vacated, CAIR.**
 - EPA represented to the Court an approximate schedule of 2 years to complete a revised rulemaking.
- **EPA is granting a stay to Minnesota sources based on Court's decision.**
- **CAIR uncertainty, specifically in the East has caused:**
 - Additional delays in submission of some PM_{2.5} attainment SIPs and Regional Haze/BART SIPs
 - Has also caused delays in EPA's review of those SIPs that have been submitted
- **Working to develop a replacement rule for the CAIR that is consistent with the Court's decision. Will need to address issues on:**
 - Emissions trading
 - Attainment and maintenance of standards
 - PM_{2.5} and ozone standards (1997, 2006, 2010)
 - Budget and/or allowance allocations
 - Significant contribution and remedy

CAIR Remains In Effect



Source: EPA, 2007

Major Issues for CAIR Replacement Rule

- **Whether/how to address ozone and PM_{2.5} NAAQS beyond 1997 standards**
 - Single rule vs. multiple rules
- **Approaches to defining significant contribution and interference with maintenance**
 - Determines which states will be in the program and stringency of rule
- **Methods for identifying upwind to downwind linkages**
- **Regulatory approaches to “prohibit emissions that significantly contribute” to nonattainment or interfere with maintenance**
- **Which states should be covered?**
- **Which source categories to include in the program?**
- **What is the right combination of SIPs and FIPs to achieve reductions expeditiously?**
- ***Several of the issues are interrelated.***

Technical, Policy, Legal, and Programmatic Analyses

- **Analyses include:**
 - Upwind state contributions to downwind areas
 - New air quality modeling based on emissions projected for 2012
 - Costs and other impacts of various regulatory approaches; technical feasibility; distributional effects; potential for non-air quality impacts
 - Remedy options
 - Human health and environmental impacts
 - RIA and other analyses in support of statutes and E.O.s that affect rulemaking
 - Estimate of administrative burden (ICR)
 - Analysis of legal risks associated with various technical and policy options
- **Coordination with other air program activities:**
 - Consideration of utility MACT, revised NAAQS (possibly including greenhouse gases), BART, RACT, Section 126 petitions of NC and DE, interactions with Title IV

ICI Boiler Rulemakings

- **Boiler MACT**
 - Industrial, Commercial, and Institutional Boiler and Process Heater NESHAP
 - Subpart DDDDD of part 63
 - Promulgated – September 13, 2004
 - Vacated by Court – July 30, 2007
 - Applies to boilers at major sources of HAP

- **Area Source Rulemaking for Boilers**

Vacated Boiler MACT - Litigation

- **Litigation**

- Jointly filed by NRDC and Sierra Club
- Combined with litigation on the CISWI Definition Rule

- **Issues**

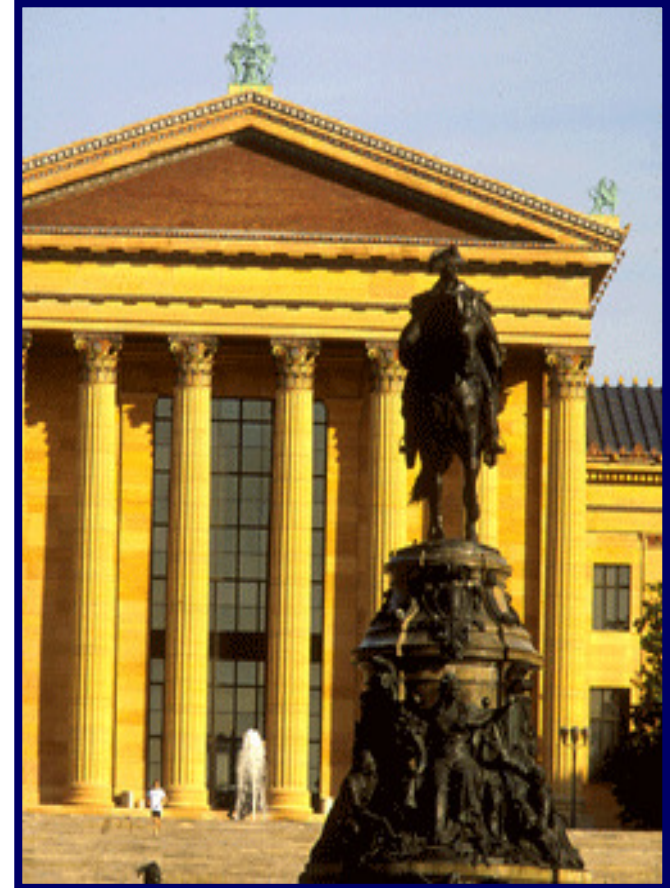
- Failed to establish limits for all subcategories and HAP
 - “No emission reductions” MACT floor
- Adopted individualized risk-based exemptions
 - Health-based compliance alternatives (“HBCA”)
- Regulated solid waste incineration units under the Boiler MACT, instead of the CISWI rule



Litigation Issues

- **March 13, 2007 - Brick Decision**
 - “no emission reduction” MACT floors unlawful
 - Cannot use work practice option without making finding required by 112(h)
 - Not practicable to enforce due to technical or economic limitations

- **June 19, 2007 – Boiler MACT Decision**
 - Vacated CISWI Definition Rule
 - Could not define “solid waste” based on type of combustion unit
 - Vacated Boiler MACT
 - Court concluded that the Boiler MACT would be substantially revised due to vacatur of CISWI Definition Rule
 - Did not rule on Boiler MACT issues



Boiler MACT – “Take Two”

- **Schedule**

- Parallel court-ordered schedules for Boiler MACT, area source boiler rule and CISWI regulations
 - Proposal – **April 15, 2010**
 - Promulgation – **December 16, 2010**


- **Revisions**

- Define solid waste
 - EPA’s Office of Solid Waste is leading the development of a definition of non-hazardous solid waste
 - OSW issued ANPR on waste definition January 2, 2009
 - Proposal scheduled by April 15, 2010
 - Remove waste-burning units from Boiler MACT database
- Reassess emission limits
 - In accordance with recent court decisions
- Develop MACT floor “emission limits” for subcategories and HAP currently having no emission standards
 - Replace “no control floors”

Information Collection Request (ICR)

- **ICR purpose is to address the court decisions**
 - Revise population of affected units under section 112 and 129
 - Update existing emissions database
- **ICR is for major source facilities with boilers and facilities with CISWI units**
- **ICR has two phases**
 - First phase: survey
 - Questionnaire to collect info on materials combusted, controls, and emissions
 - Timing
 - Mail out August 15, 2008
 - Sent to all facilities (~3,000) that were subject to Boiler MACT
 - Sent to about 500 CISWI facilities
 - Second phase: testing
 - About 300 facilities (200 Boiler MACT, 100 CISWI)
 - **Results due October 15 – November 15, 2009**
 - Testing needed:
 - » Fill data gaps
 - » Determine appropriate surrogates
 - » Determine variability

Summary of Survey Database (Boiler MACT)

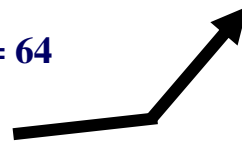
- **No. of facilities = 1549**
 - Small entities = 144
 - Breakdown by industry sector 

- **No. of units = 13,100**
 - Units > 10MMBtu/hr
 - Boilers = 4265
 - Coal – 537
 - Oil – 669
 - Natural Gas – 1998
 - Biomass 338
 - Process Heaters = 2144
 - Units < 10MMBtu/hr
 - 6694 gas-fired

Industry Sector	Number of Facilities
Utilities	161
Food Manuf.	107
Wood Product Manuf.	188
Paper Manuf.	165
Petroleum Manuf.	71
Chemical Manuf.	216
Plastics & Rubber Products Manuf.	82
Primary Metals & Metals Product Manuf.	96
Transportation Equip. Manuf.	90
Furniture Manuf.	45
Educational Services	27
National Security	22

Summary of Boiler MACT Test Program

- **Data requested include CO, THC, dioxins, formaldehyde, HCl, HF, Hg, 11 non-mercury metals, PM (filterable, condensable, PM2.5), NO_x, and SO₂, and fuel analysis**
- **No. of facilities requested to conduct testing = 158**
 - 5 facilities are testing 2 units
 - 6 facilities conducting 30-day CEM test for CO/THC/methane/NO_x
 - 2 coal units, 2 biomass units, 2 gas units
 - Breakdown of fuels being tested
 - 30 natural gas units
 - 48 coal units
 - 37 biomass units
 - 32 liquid fuel units
 - 11 process gas units (refinery, coke oven gas, blast furnace gas, landfill gas)
 - 5 nonfossil liquid/solids units
- **No. of facilities withdrawn (but replaced by others) = 64**
 - Reasons varied for withdrawal/replacement



Reason for Withdrawal	Number of Facilities
Shutdown	22
Not burning listed fuel	9
Not boiler or process heater	6
Hardship	5
No sampling ports	5
Subject to another MACT	3
Common Stack	2
Area Source	3
CISWI Unit	2
Seasonal – not currently operating	2
Not listed boiler type	2

Most Common Boiler Rulemaking Questions

- **How will we subcategorize boilers and process heater?**
 - By boiler type?
 - By fuel type?
 - By industry?
- **Will surrogates be used?**
 - CO (or THC) for organic HAP?
 - PM (or PM_{2.5}) for metals?
 - HCl for acid gases (HF)?
- **What HAP will be regulated for gas-fired units?**
- **Will the HBCA be included in the proposal?**
- **Will emission data from units that installed controls to meet the vacated Boiler MACT be used (i.e. MACT on MACT)?**



Information and Contact

- **Information on the MACT and area source rulemakings for industrial, commercial, and institutional boilers is available on EPA's web site at:**
 - www.epa.gov/ttn/atw/combust/list.html
- **Newest version of the ICR survey database is posted at:**
 - <http://survey.erg.com/ss/wsb.dll/s/7g8d/>
- **Contact: Jim Eddinger**
919-541-5426
eddinge.jim@epa.gov

Policy Challenges for New Industrial and Power Generation

• Statutory

- New Source Performance Standards (NSPS)
 - Criteria Pollutants (NO_x, SO₂, PM (direct, secondary))
 - GHGs?
- Maximum Achievable Control Technology (MACT)
 - 112(g) – “Case by Case MACT”
 - 112(f) – “Residual Risk”
- National Ambient Air Quality Standards (NAAQS)
 - State Implementation Plans (SIPs)
- National Permitting Issues
 - New Source Review (NSR)
 - Prevention of Significant Deterioration (PSD)
 - Title V Reform
- Definition of Solid Waste
 - Non-Hazardous Solid Waste – Section 129 Incineration Regulations
 - Fuels – Section 111 and 112 Requirements

• Legislative

- Carper 3P Bill
 - NO_x, SO₂ and Hg
- Waxman-Markey Climate Bill
 - Capped Sources (> 25,000 tpy)
 - Non-Capped Sources

• Hybrid Approaches



Many Policies, Many Potential Directions – Stay Tuned!