Boilers, Process Heaters & Environmental Issues

Robert D. (Bob) Bessette
Council of Industrial Boiler Owners

PENC November Seminar

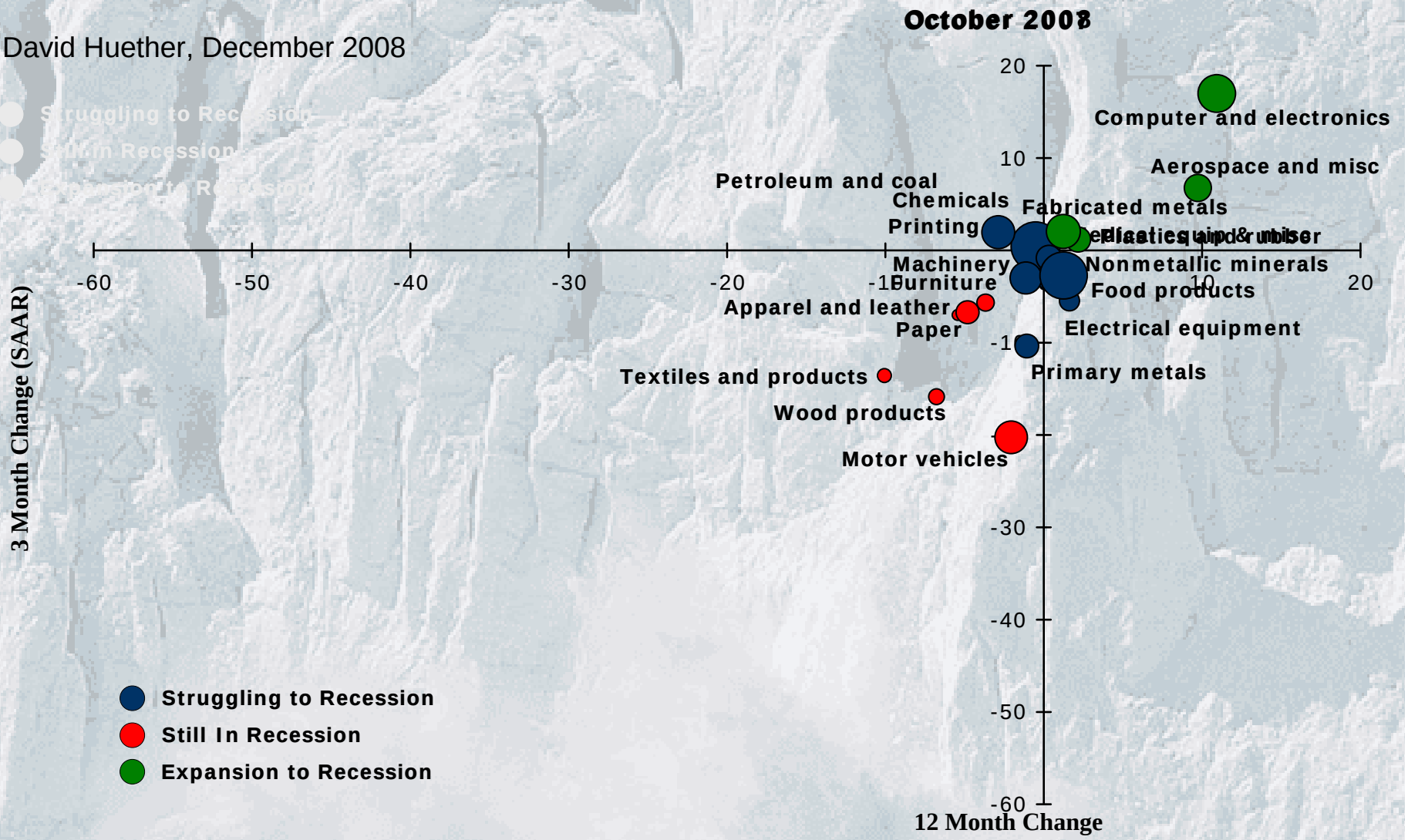
Statesville, North Carolina
November 10, 2009

What are we talking about today(.)(?)

- Where are we today?
- Boiler MACT & Environmental Uncertainty.
- The litany of Environmental Issues
  - Green House Gas Regulation
  - NAAQS: $PM_{2.5}$, Pb, NO_2, SO_2, Ozone & CO
  - Combustion: CAIR, CAMR, NSPS & Boiler MACT
  - Waste: Coal Combustion Byproducts & TDS
- The Laws of Physics, Boilers & Combustion
- Where's the Energy?
- Industrial Energy Owner Needs

National Associations of Manufacturers

David Huether, December 2008



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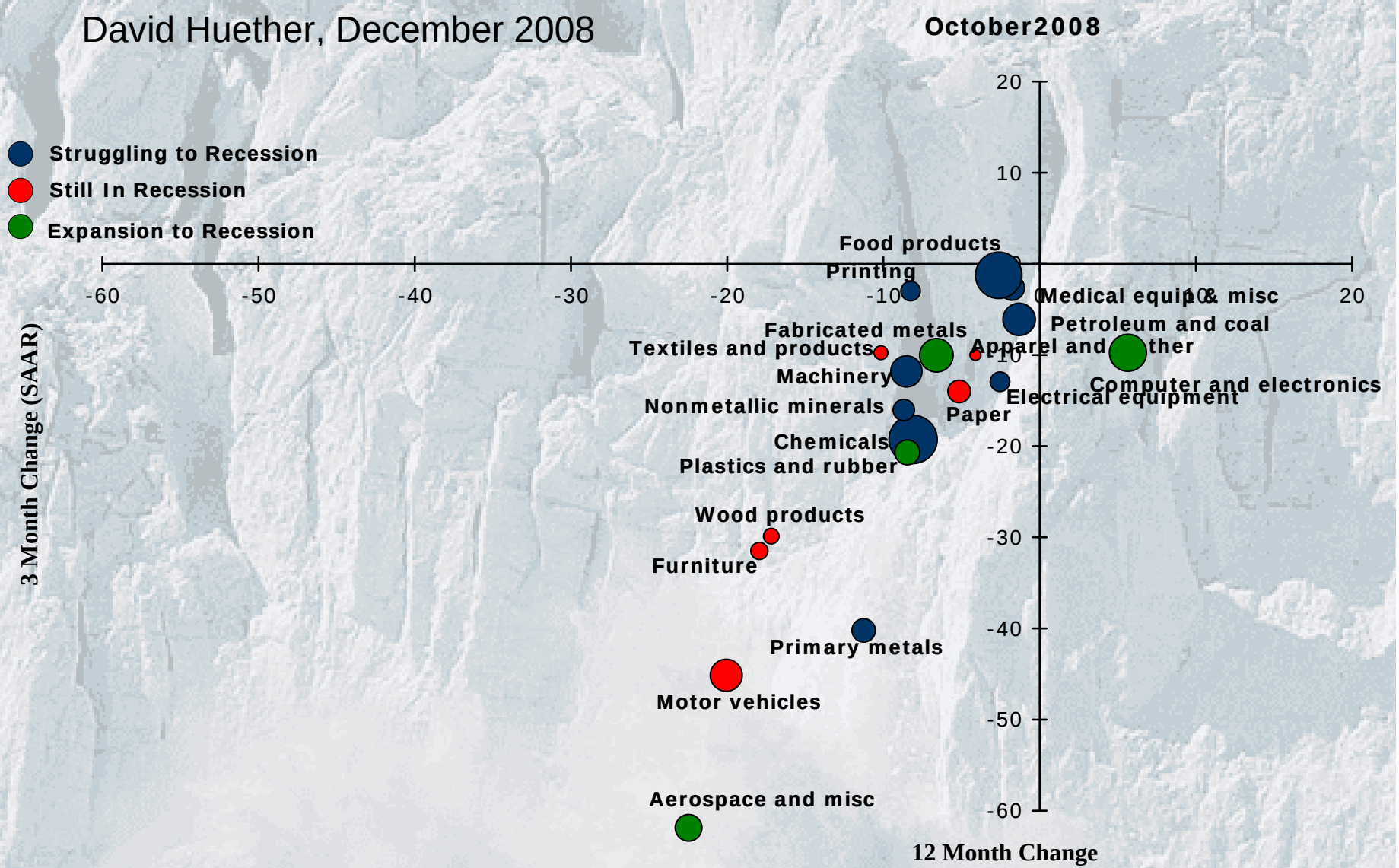


Greenhouse Gas Regulation

- Topics to cover today:
  - Final EPA GHG reporting rule
  - EPA Endangerment finding
  - EPA's proposed GHG tailpipe standards
  - EPA's proposed Johnson *Deseret* guidance reconsideration rule
  - EPA's proposed Prevention of Significant Deterioration (PSD) & Title V tailoring rule
  - EPA's new Clean Air Act Advisory Committee (CAAAC) work group on GHG Best Available Control Technology (BACT)
  - EPA review of GHG New Source Performance Standards (NSPS) for utility/industrial boilers

EPA Final GHG Reporting Rule

- Industry comments led to a more flexible rule, but concerns remain
  - **Biogenic CO2 not included in 25K tonnes threshold calculation, reported separately**
  - **No reporting from industrial wastewater & landfills (yet)**
  - **Annual reporting, not quarterly**
  - **No 3rd party verification, but higher level of inquiry than Title V required as part of self-certification**
  - **Can drop out of rule if below 25K tonnes for 5 years or 15K tonnes for 3 years**
  - **CBI to be addressed through separate rulemaking**

EPA Final GHG Reporting Rule

- Key combustion source issues:
  - **Can use best available monitoring methods 1/1/10 through 3/31/10 if infeasible to acquire, install, operate required equipment; extension available through 12/31/10**
  - **Otherwise, 4 tier system still in place. Helpful flexibility:**
    - **If comb. sources only, abbreviated reports for 2010**
    - **If CEMs required but not up and running by 1/1/2010, can wait until 1/1/2011**
    - **Common stack sources can measure and report consolidated emissions**
    - **Where 2 or more units of 250 mm Btus/hr or less, can consolidate reporting**
    - **Can back-calculate biomass/solid fuel emissions**
    - **Nat gas and distillate units >250 mm Btus/hr can use Tier 2**
    - **Vendors can supply heat rates**

EPA Endangerment Finding

- Key issues (2 part test): 1) can GHGs be reasonably anticipated to endanger public health or welfare? 2) do emissions from relevant source categories cause or contribute to this air pollution?
- Final finding "will not itself impose any requirements on industry"
- Timing: within next 2 months (Gina McCarthy at 10/7 CAAAC) or delayed to March?
- Key questions:
  - Public health, welfare, or both?
  - Sufficient record for decision?

EPA GHG Tailpipe Standards Proposal

- Companion piece to proposal to make CAFE` standards more stringent (DOT)
- Directly responds to Mass v EPA Supreme Court case
- Part of deal with California, auto manufacturers
- Due to go final by end of March 2010
- Issues:
  - What's the hurry?
  - CAFÉ` standards alone will have same impact

EPA Reconsideration of Johnson *Deseret* Guidance Proposal

- **Irony: Obama EPA proposes to agree with Bush administration viewpoint**
- **EPA preferred view: GHGs become "regulated pollutants" under the CAA only when regulations require actual control**
- **Petitioners view: GHGs become "regulated pollutants" when EPA requires monitoring or reporting**
- **EPA arguments:**
  - **EPA needs time to assess need for regulation of new pollutants, monitoring part of that assessment**
  - **Provides opportunity for notice & comment**
  - **Allows EPA to develop process to set PSD standards**
  - **Follows literal reading of CAA**
  - **Otherwise could lead to absurd results (O2 as regulated pollutant)**

EPA Proposed PSD & Title V Tailoring Rule

- Issue: combination of final endangerment finding and final GHG tailpipe standards make GHGs regulated pollutants, immediately triggering PSD and Title V requirements for major stationary sources
- Problem: without EPA assistance PSD major source threshold is 100/250 tons of GHGs per year, Title V threshold is 100 tons of GHGs, and addition of new equipment or modification of existing equipment that increases GHG emissions by “any amount” triggers PSD and BACT

EPA Proposed PSD & Title V Tailoring Rule

- Projected impacts without EPA rules: TOTAL CHAOS
  - 41,000 PSD permits vs. 280 today; cost impacts > $250 million; permit authorities would need on average12 new FTEs each, without them PSD permits would take at least 3 years; hiring and training new FTEs would take 3 years
  - 6.1 million new Title V permits would be required vs. 14,700 today; $15 billion of new costs; 57 new FTEs would be needed per agency, and without them Title V permit processing would take 10 years; 29 additional enforcement & judicial staff would be needed; hiring & training staff would take 3 years

EPA Proposed PSD & Title V Tailoring Rule

- What EPA proposes to do:
  - Raise PSD & Title V major source thresholds to 25,000 tons (would only eliminate 7% of stationary source emissions)
  - Raise PSD significance thresholds to between 10,000 and 25,000 tons
  - Over next 5 years after rule goes final, investigate streamlining options, including revisions to calculation of PT especially for smaller sources; general permits; and presumptive BACT
  - In 6th year, promulgate new rule with revised applicability a significance thresholds, and various streamlining methods

EPA Proposed PSD & Title V Tailoring Rule

- Legal justification for these changes:
  - "absurd results" doctrine: results would contravene Congressional intent and undermine purpose of programs
  - Administrative necessity: state programs would be impossible to administer
- Problem areas
  - Legal justification vulnerable to challenge
  - Some streamlining techniques may be legally vulnerable (presumptive BACT)
  - Lower PSD & Title V thresholds remain on the books under state law
  - Retroactive liability if rules are overturned

New CAAAC GHG PSD BACT Work Group

- BACT for GHGs is not addressed in the "PSD Tailoring" rule
- However, states will need to be ready to address BACT requirements by the end of March 2010
- EPA is planning "guidance" to the states, but due to the short time available to define BACT for GHGs EPA is looking for assistance from stakeholders through the CAAAC; new Work Group was formed at the 10/7 CAAAC meeting

New CAAAC GHG PSD BACT Work Group

- Work Group charge:
  - Evaluate GHG reduction technologies, costs, performance
  - Encourage cost-effective, high-performing new technologies
  - Look at multi-pollutant reduction opportunities
- Work Group membership: EPA, NACAA, NRDC, ED, Clean Air Trust, states, autos, paper, utilities, oil, lawyers
- EPA staff leads: Peter Tsirigotis, David Solomon, Lisa Conner, Teresa Clemons, Anna Wood

New CAAAC GHG PSD BACT Work Group

- Work Group issues:
  - Few BACT experts, too few industries represented?
  - Design changes on the table
  - Fuel switching on the table
  - Truly “outside the box” thinking discouraged due to short time frame; only look at traditional BACT
  - Top-down policy will be employed
  - Work Group reports to CAAAC, which is only group that can formally “advise” EPA, so WG decisions may be rehashed by CAAAC
  - Are right EPA staff involved?

NSPS for GHGs

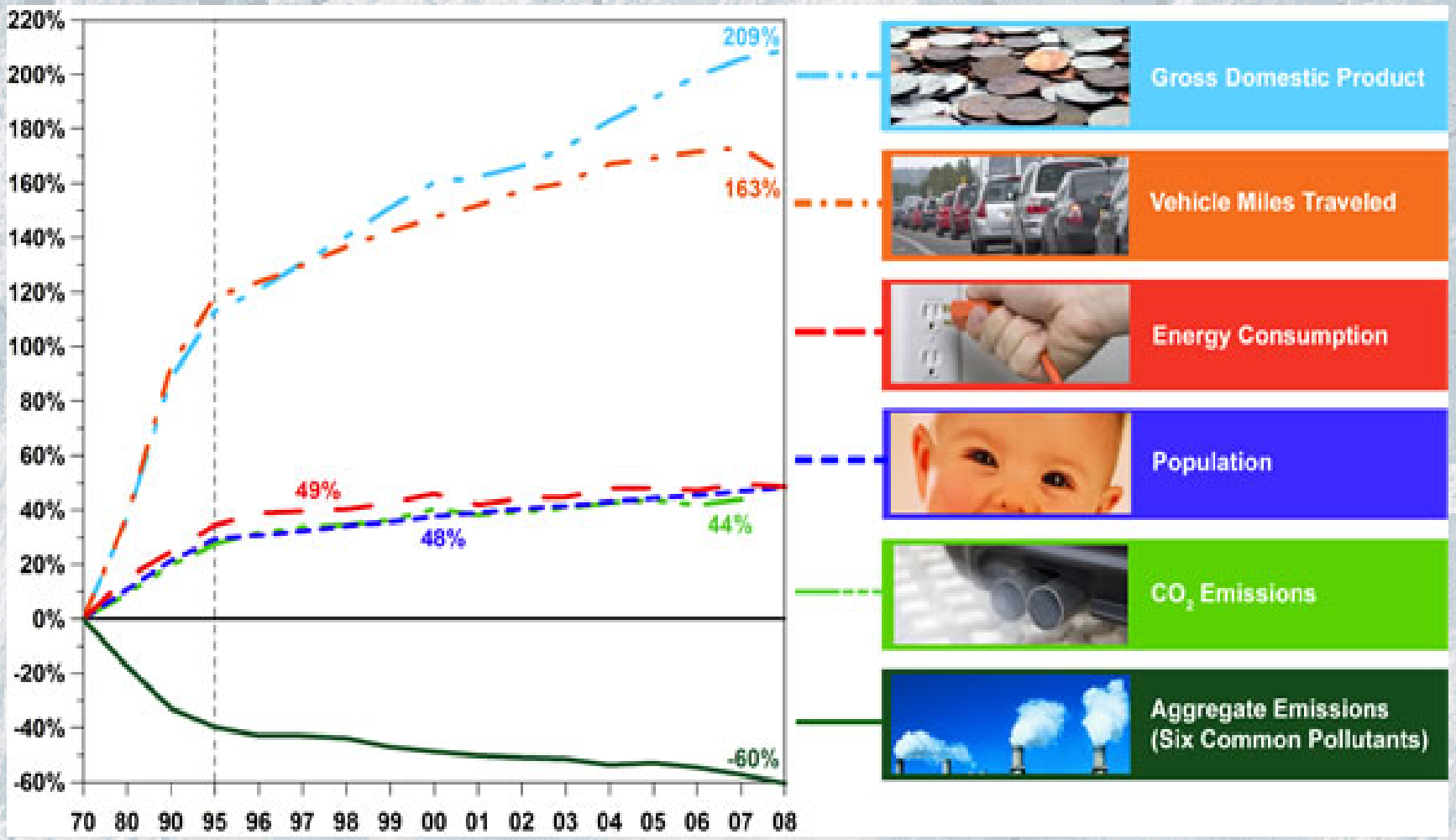
- Boiler NSPS (Subparts Da, Db, Dc) currently under a voluntary remand; EPA interested in integrating utility MACT and NSPS revisions, possibly including GHGs. Utility boilers appear to be the initial focus, but EPA has noted that industrial boilers are the second largest emission source.
- Other categories being considered: refineries, cement, adipic acid
- Big question: what should boiler NSPS look like for GHGs? BACT work will be important

NAAQS Issues

- Background
- Current Challenges
- A look at what's coming…

Background: Air Quality

Comparison of Growth & Emissions - 1970 to 2008



How did we get here? Current Control Measures

Stationary Sources:

- New Source Performance Standards
- Major & Minor New Source Review
- SIP Rules Limiting Emissions
- State RACT & BART requirements
- Acid Rain Requirements – SOx, NOx
- NOx SIP call – Eastern US
- Regional Haze Requirements
- MACT & NESHAP requirements – air toxics

How did we get here?
Current Control Measures

Stationary Sources

- MACTs – MON, HON, Pharma
- Solvent and Coating Rules
- OTC/NOx SIP Call

Utilities

- Acid Rain Program
- OCT/NOx SIP Call

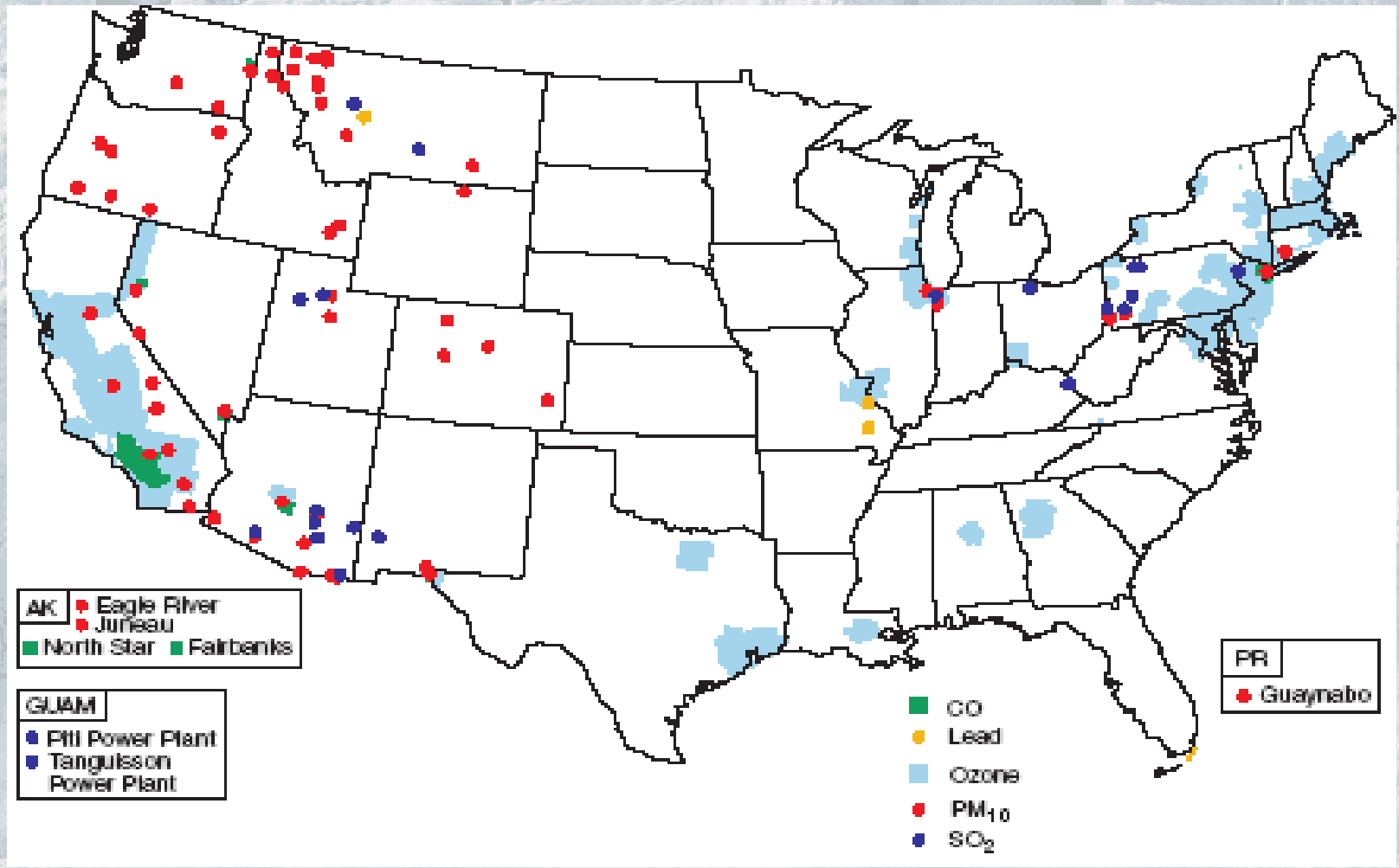
How did we get here?
Current Control Measures

Mobil Sources

- Tier I Emission Controls
- Reformulated Gasoline
- National Low Emission Vehicle Program
- Inspection/Maintenance Programs
- Reid Vapor Pressure Controls
- Evaporative Controls

NAAQS Improvement Results

Non-Attainment Areas through 2002

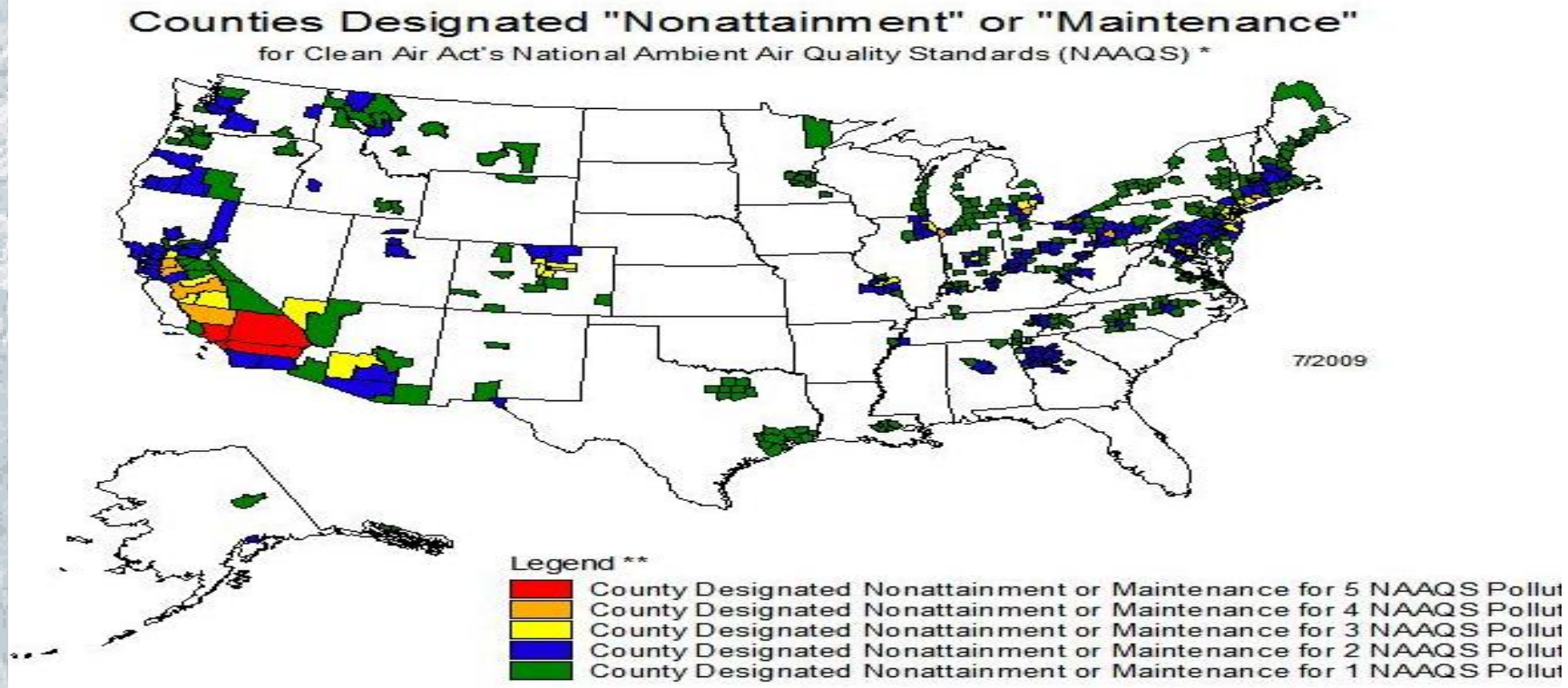


NAAQS Issues

Since then:

- 1997 8-hr Ozone NAAQS Standard Tightened
  - Non-Attainment areas designated
- 1997 PM2.5 NAAQS Standard Tightened
  - Non-Attainment areas designated
- 2006 PM 2.5 NAAQS Standard
  - Tightened the 24-hr standard. Maintained annual.
  - Non-Attainment areas just designated
- 2008 8-hr Ozone Standard promulgated
  - Non-Attainment areas yet to be designated

Non-Attainment Current Status



Guam - Piti and Tanguisson Counties are designated nonattainment for the SO2 NAAQS
Puerto Rico - Mun. of Guaynamo is designated nonattainment for the PM10 NAAQS

* The National Ambient Air Quality Standards are health standards for lead, carbon monoxide, sulfur dioxide, ground level 8-hr ozone, and particulate matter (PM-10 and PM2.5). There are no nitrogen dioxide nonattainment areas.

** Partial counties, those with part of the county designated nonattainment and part attainment, are shown as full counties on the map.

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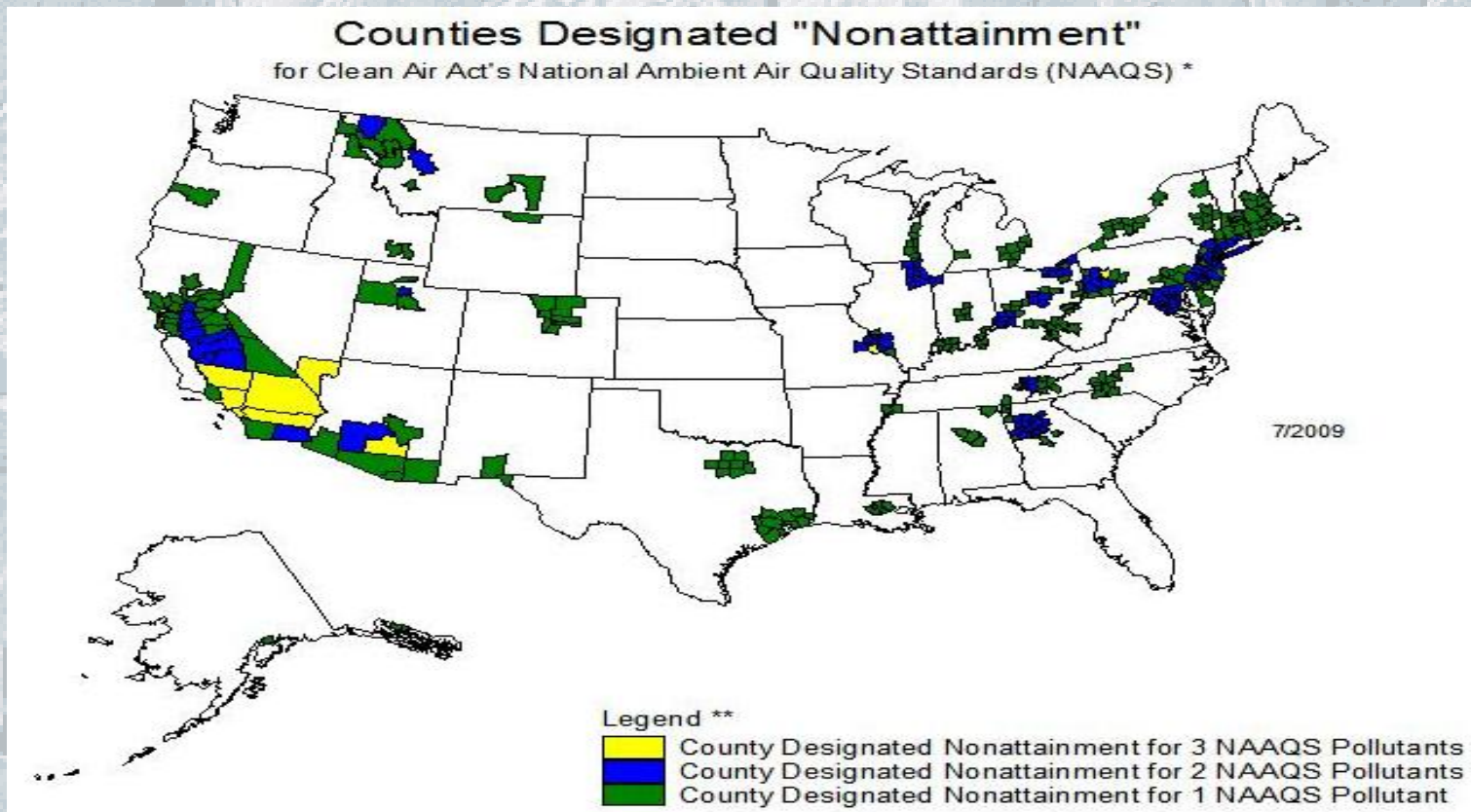

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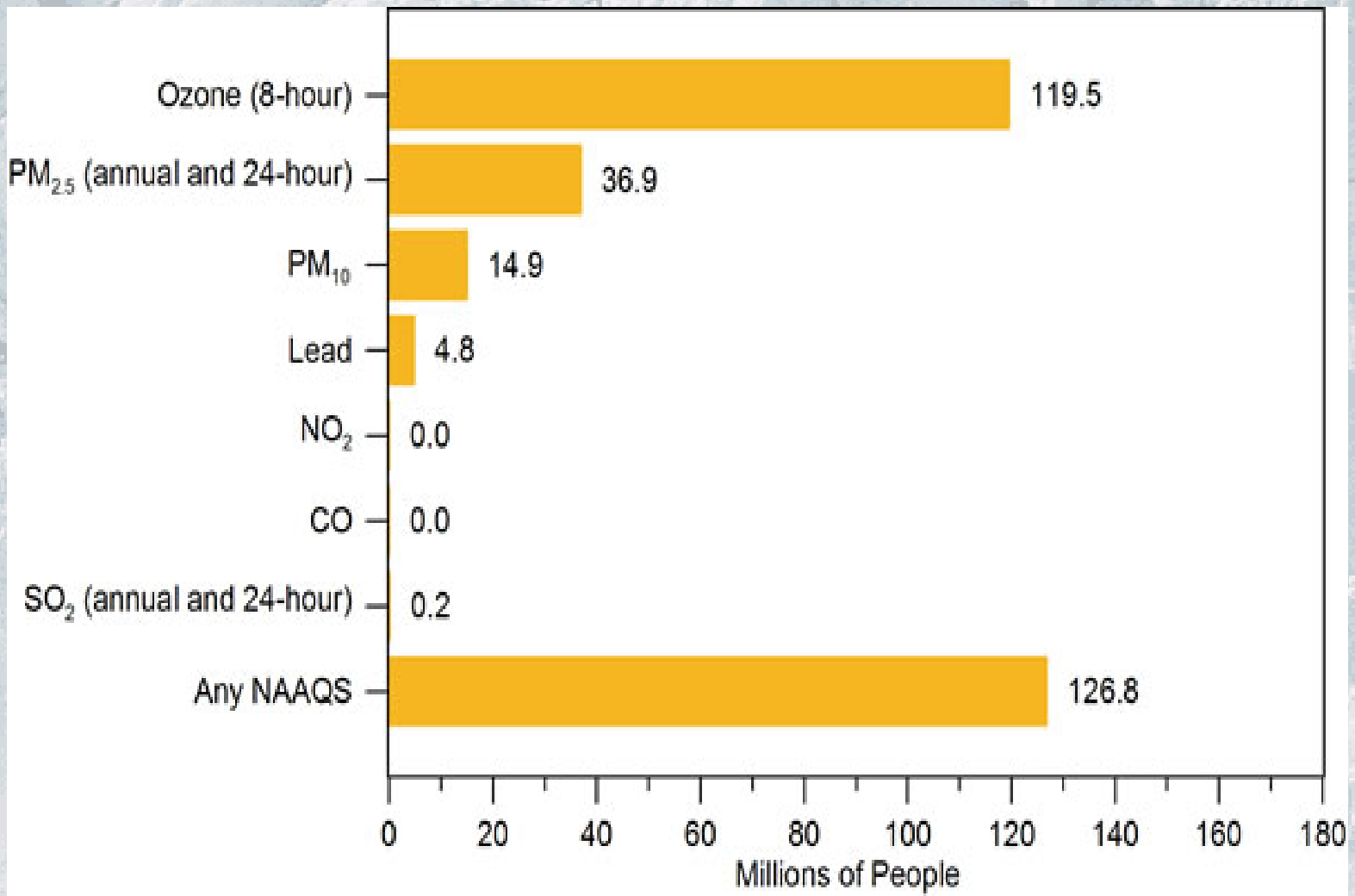
The Non-Attainment Problem: Impacts on Business

- **Retrofit Controls on Sources**
  - Lower emission limits
  - Increased site compliance cost for RACT and RACM
- **Permitting:**
  - Costly LAER vs. BACT controls on new/modified sources
  - Emission offsets needed (Issue – cost & availability)
    - States need to develop emission trading mechanisms
  - Lower NSR & Title V permitting thresholds
  - Higher emission offset ratios in Subpart 2 areas

The Current Non-Attainment Problem: Heath Impact



The Increasing Stringency of the Ozone Standard

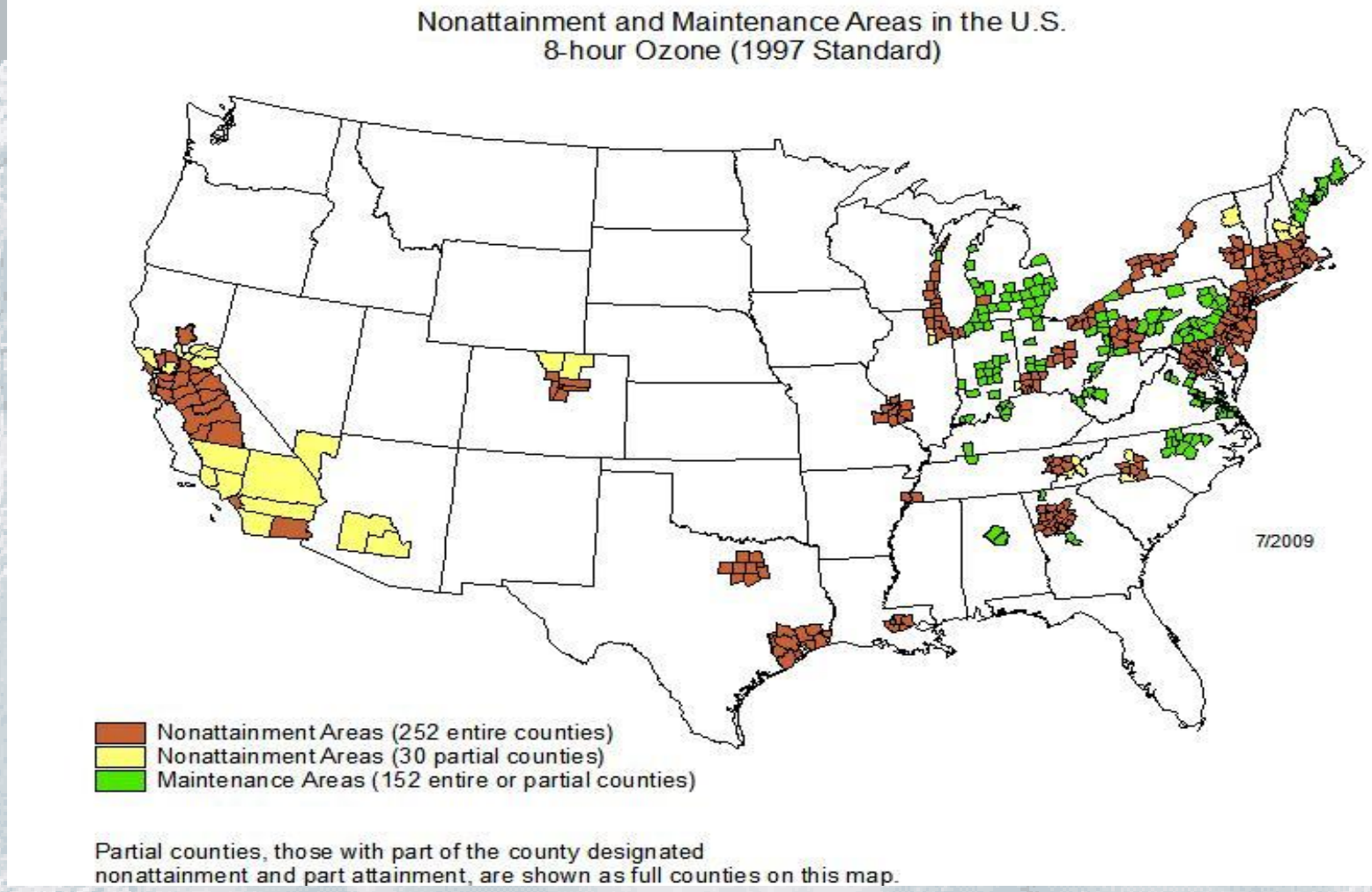
1-hr ozone standard:

- 1-hr standard was 0.12 ppm (4th highest ozone level at monitor over past 3 years)

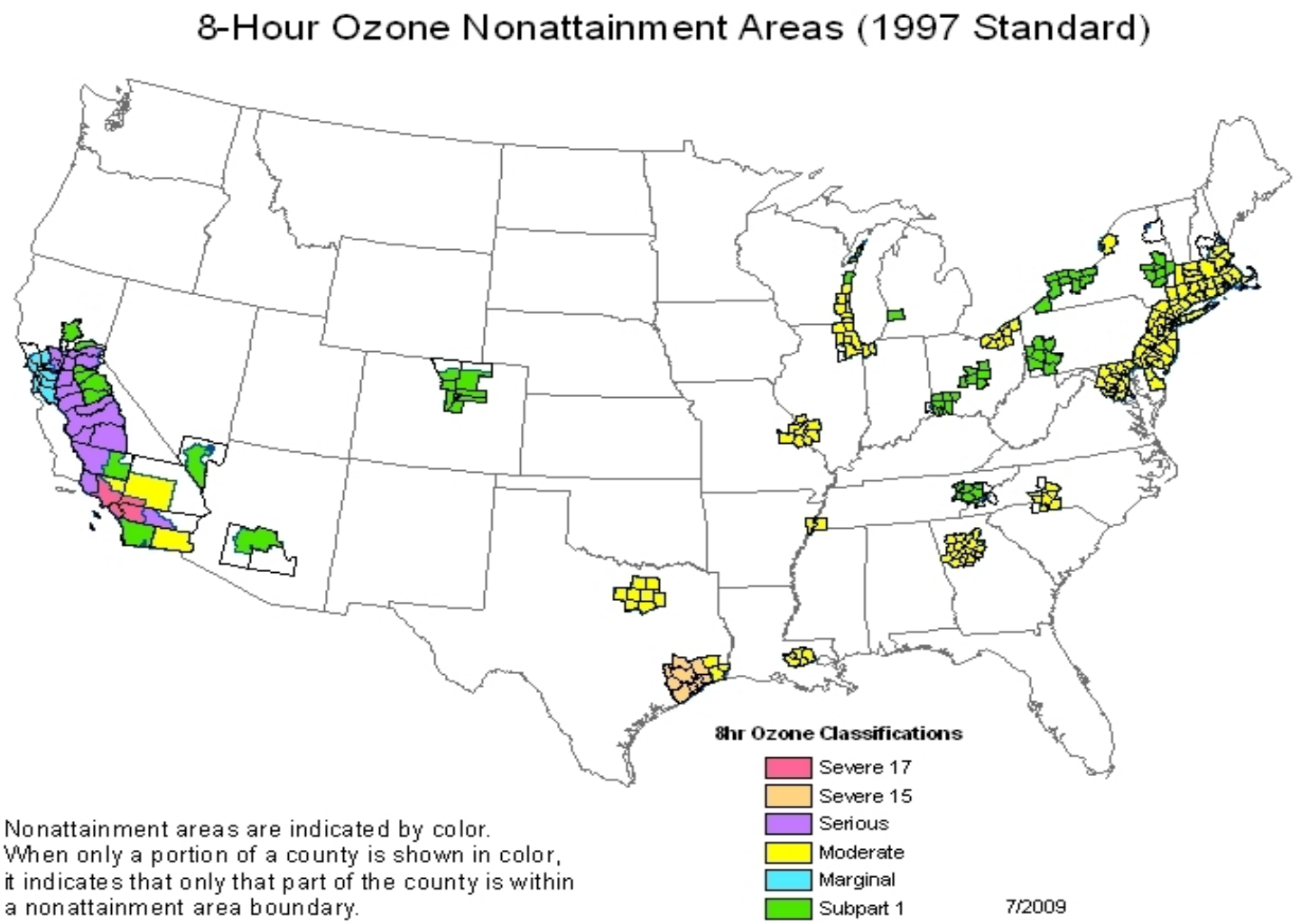
8-hr ozone standard (1997):

- 8-hr standard is 0.08 ppm (eff. 0.084)
  - 6/15/2004 Designations Final
  - 6/07 – State Implementation Plans were due
  - 2007 to 2021 – Attainment Required

NAAQS Issues - Ozone



Ozone Non-Attainment Status

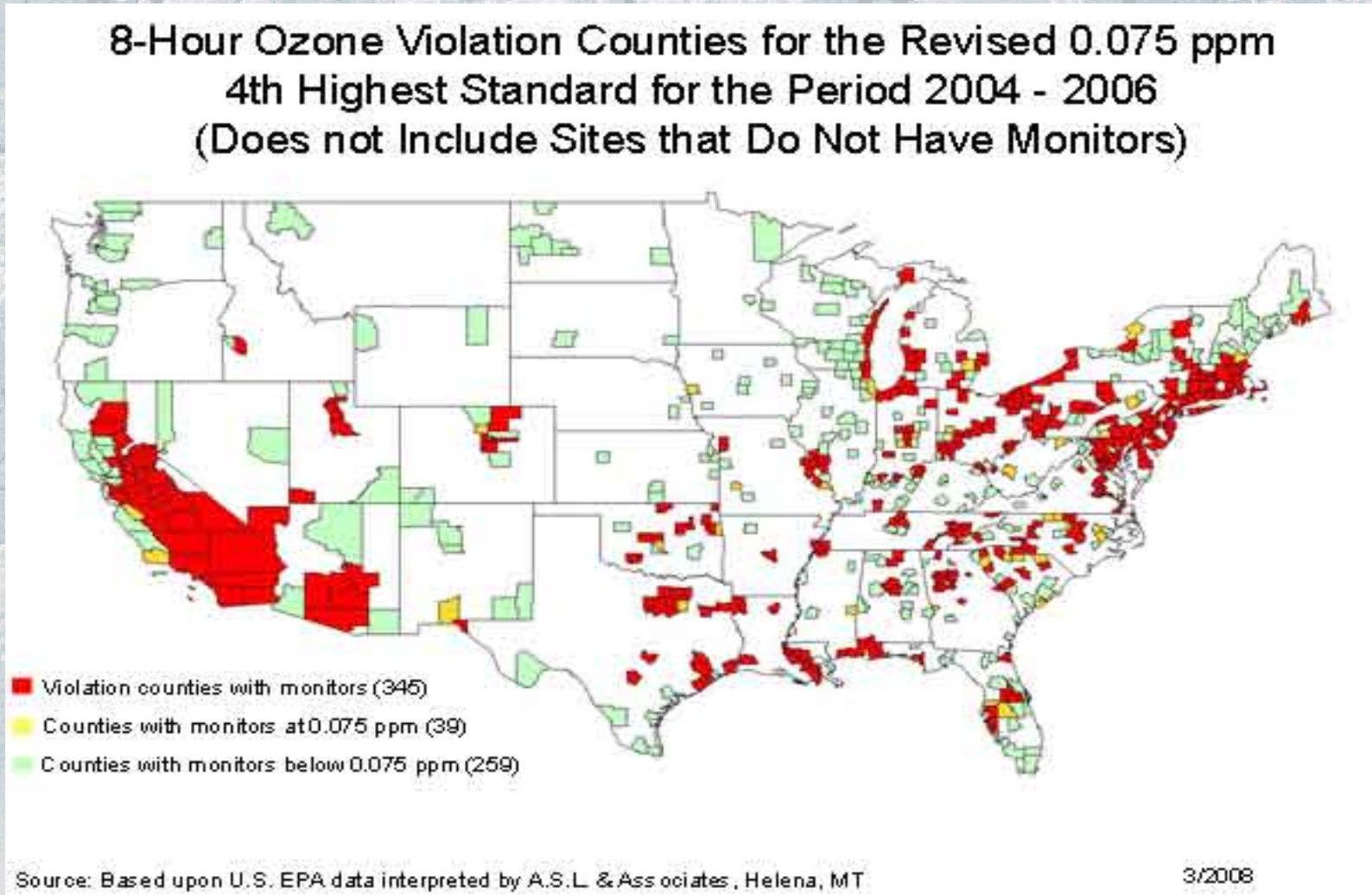


The 2008 Ozone NAAQS

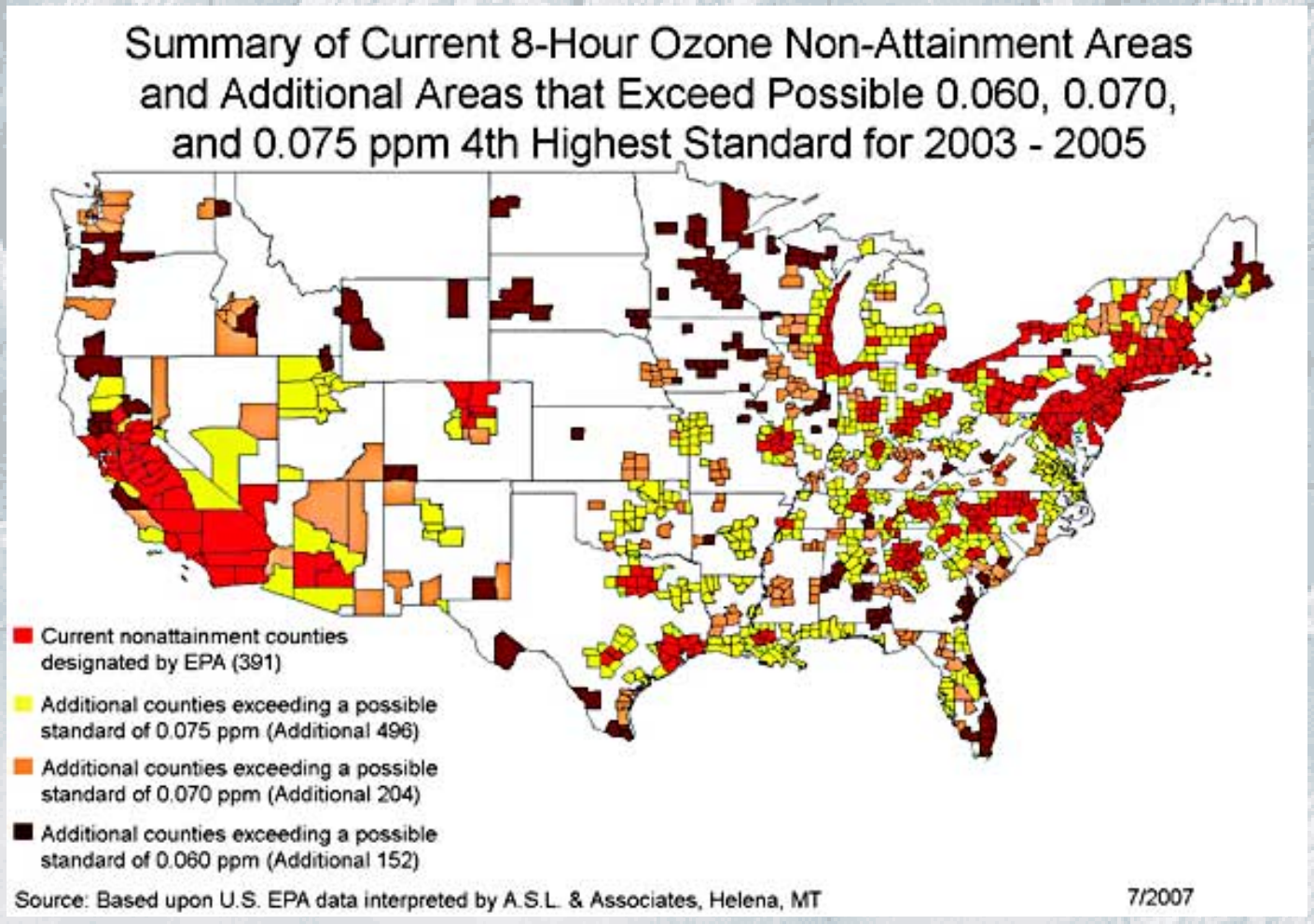
New 8-hr ozone standard established:

- 8-hr standard - 0.075 ppm
  - 3/08 - Final Ozone NAAQS Standard Set
  - 3/09 – States Recommend non-attainment areas
  - 3/10 – EPA finalizes Non-attainment designations
  - 2013 – State Implementation Plans due
  - 2013 to 2030 – Attainment Required

The 3/08 Ozone Standard Projected Designations



EPA Reconsidering 3 08 Ozone NAAQS



The Increasing Stringency of the PM 2.5 Standard

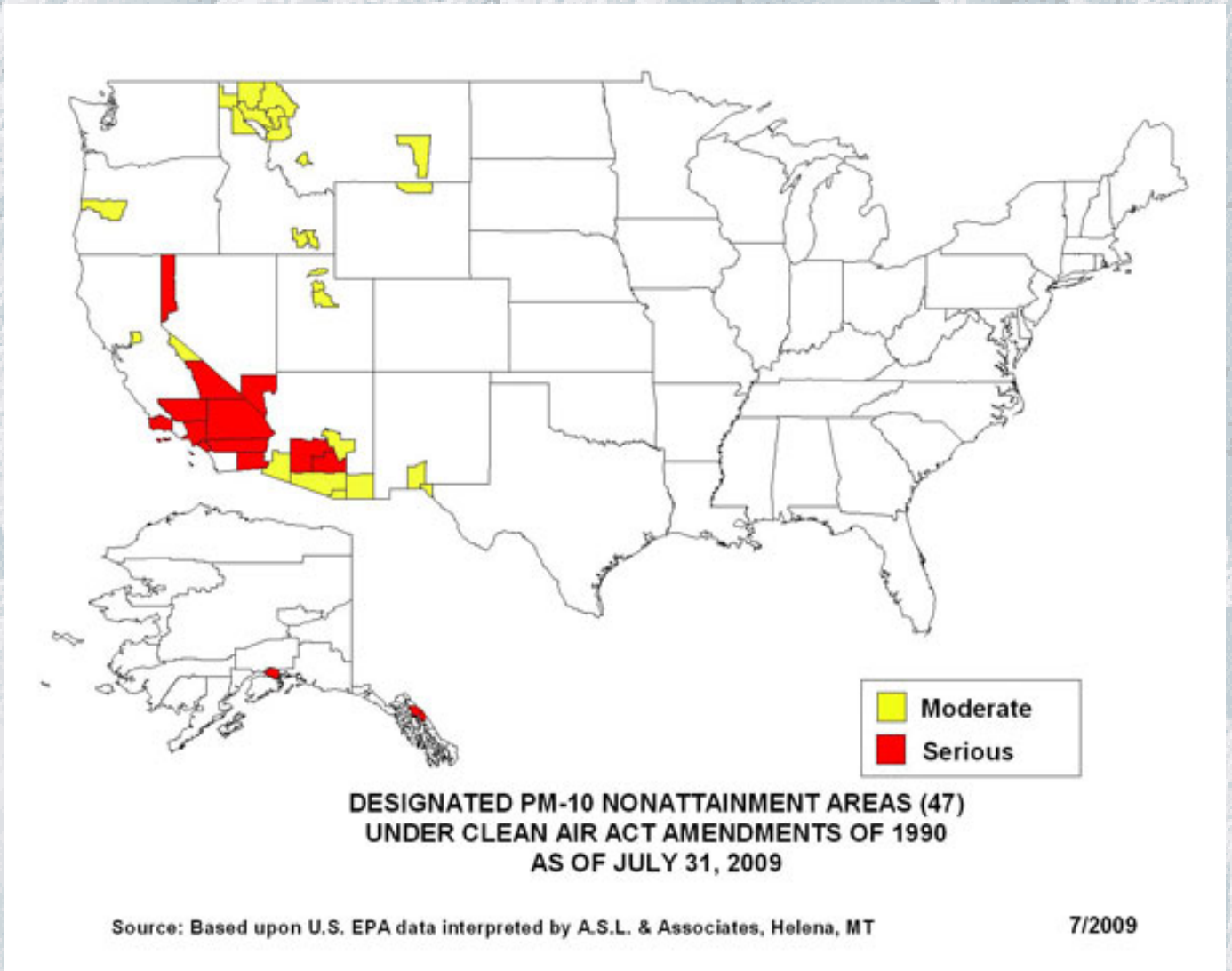
PM-10 standards

- 24-hr standard is 150 ug/m3
- Annual standard is 50 ug/m3

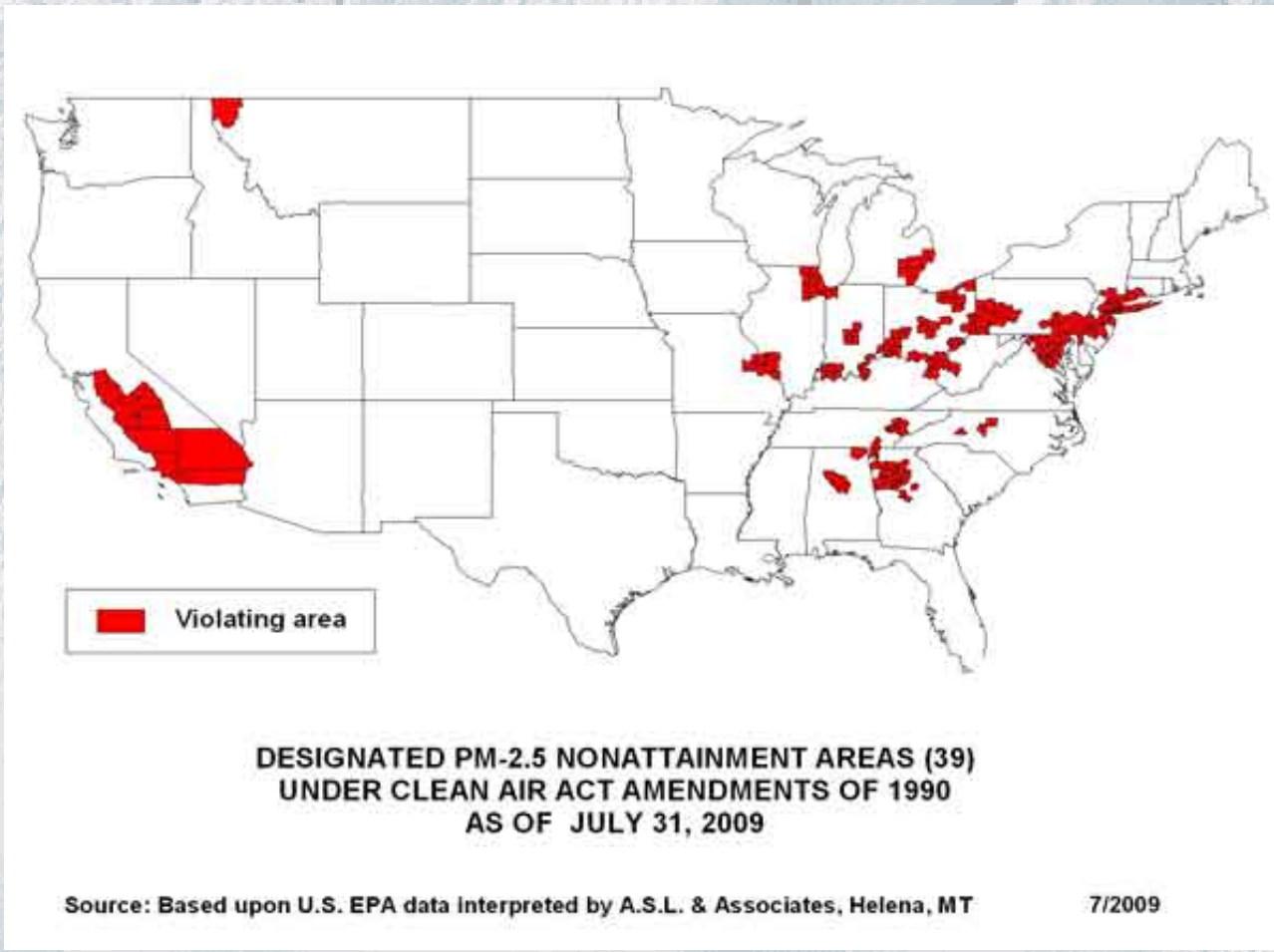
PM 2.5 standard (1997):

- 24-hr Standard is 65 ug/m3
- Annual Standard is 15 ug/m3
  - 2005 – Designations finalized and effective
  - 4/08 – State Implementation Plans due
  - 2010 – Attainment Required

PM 10 Non-Attainment 2009



New Challenge: The 1997 PM 2.5 NAAQS Standard

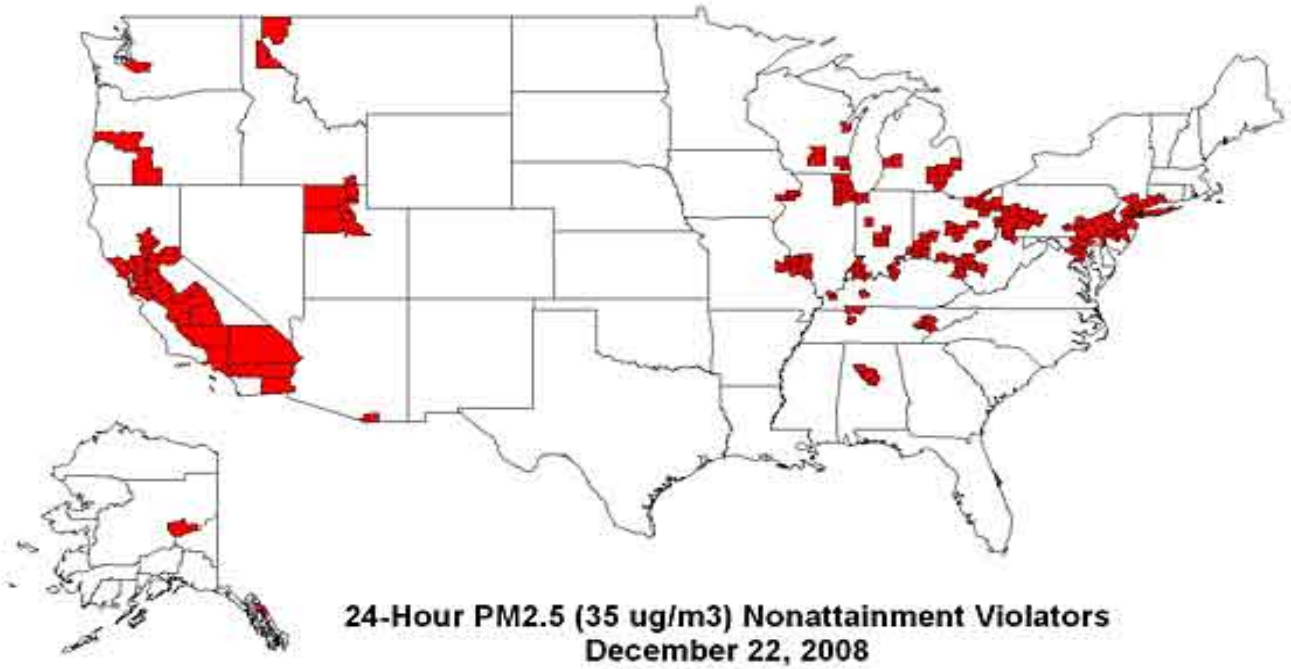


New Challenge: The 2006 PM 2.5 NAAQS Standard

New 24-hr PM2.5 standard (11/06):

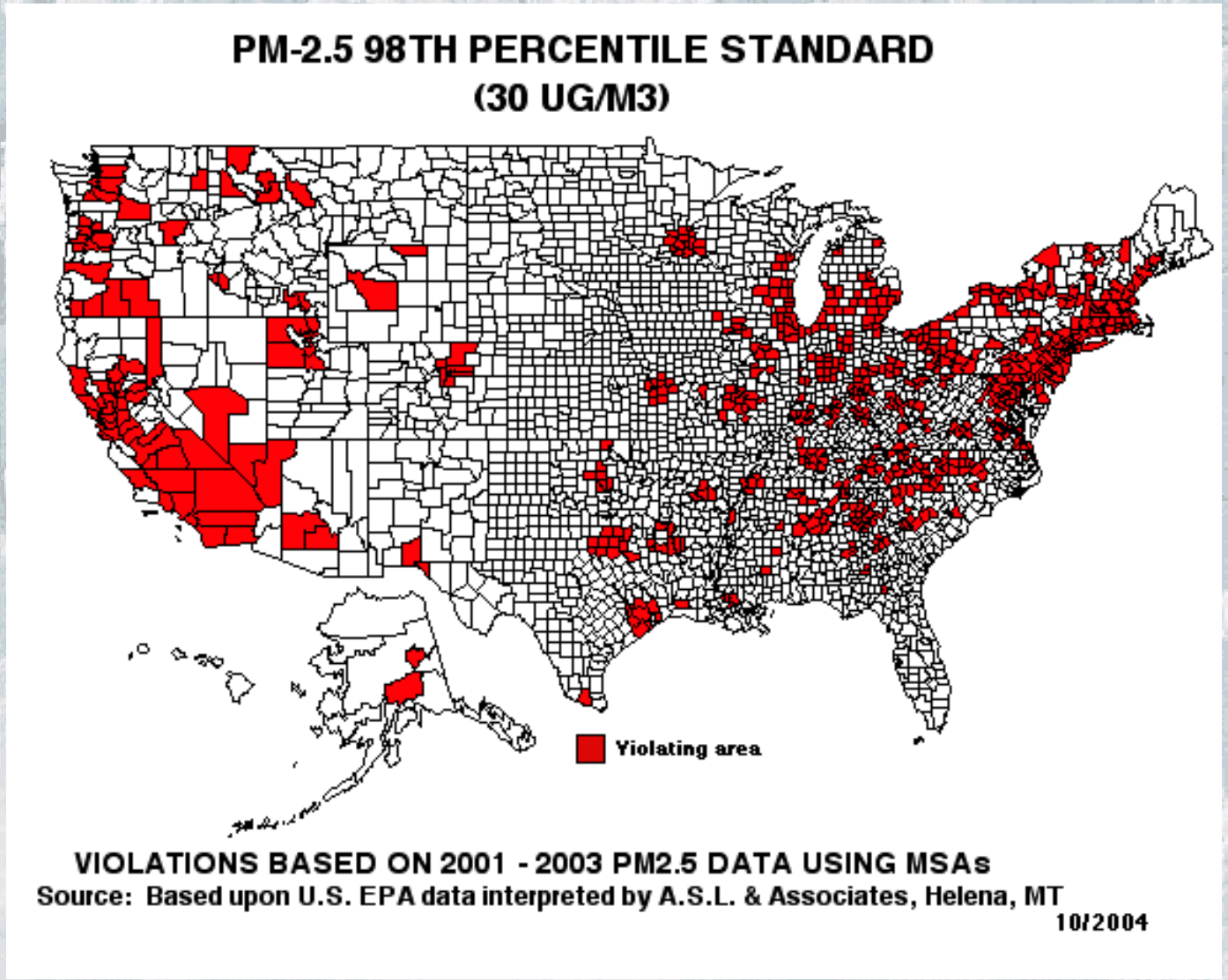
- 24-hr standard reduced from 65 to 35ug/m3
  - 12/07 State non-attainment recommendations to EPA
  - 8/08 – EPA non-attainment recommendations
  - 12/18/09 – Final Non-attainment designations made by EPA
    - Delayed by Obama Admin – Finalized 10 8 09
  - +60 days FR – State Designations effective
  - +3 yrs - State Implementation Plans due
  - +5 yrs – Attainment Required

New Challenge: The 2006 PM 2.5 NAAQS Standard

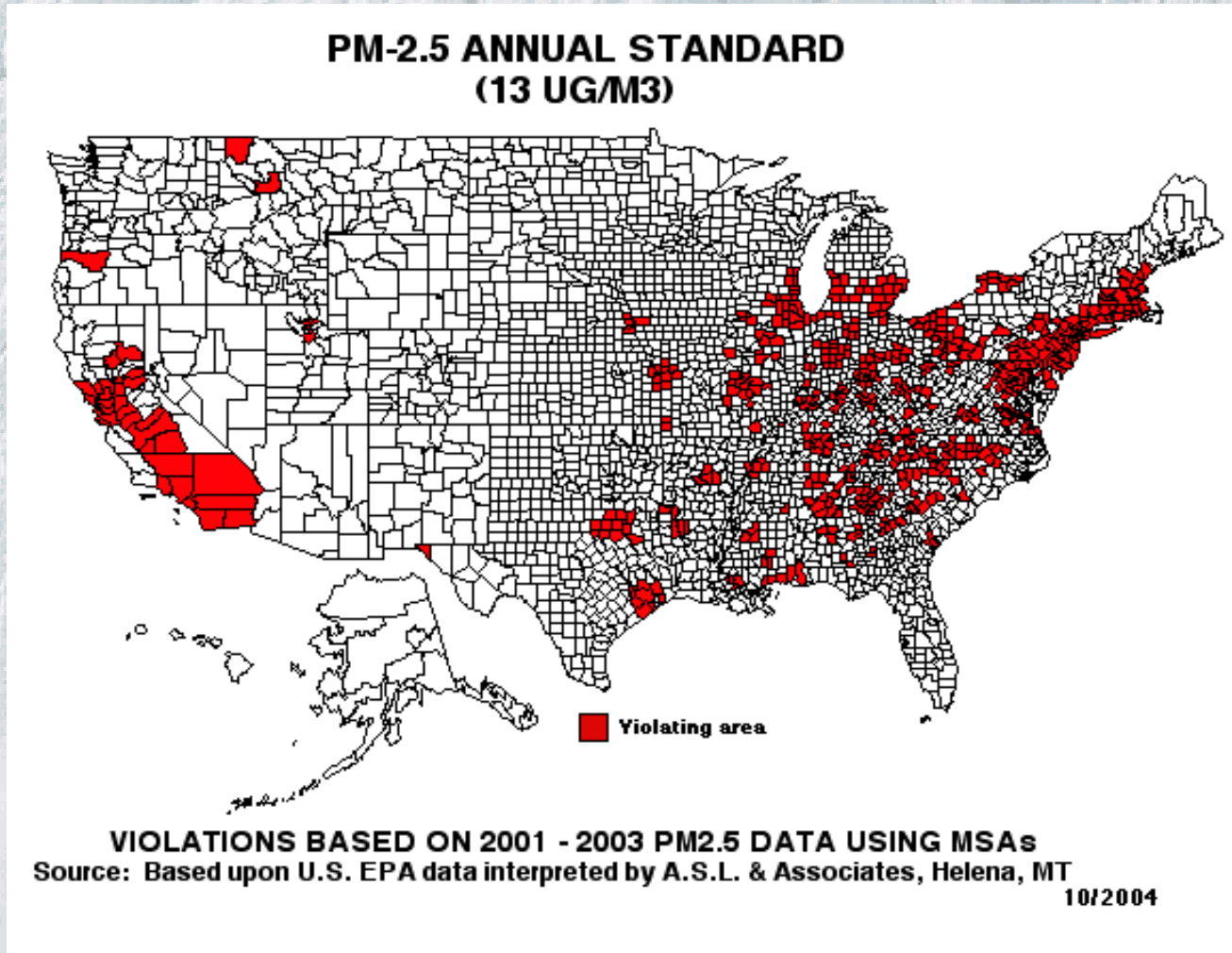


Source: Based upon U.S. EPA data interpreted by A.S.L. & Associates, Helena, MT 12/2008

PM 2.5 Standard: It Could be Worse



PM 2.5 Standard: It Could be Much Worse



NAAQS Issues: Other Pollutants?

Lead NAAQS:

- Was 1.5 ug/m3 (quarterly average)
- Now - 0.15 ug/m3 (3 month rolling average)
- Timeline:
  - State Designation Recommendations due 10/09
  - EPA designations final 6/2012

NAAQS Issues: Other Pollutants?

NO2 Primary NAAQS:

- Was 0.053 ppm annual average
- Proposed revisions 6/29/09
  - Keep annual standard at 0.053 ppm
  - Add a new 1-hr standard of between 80-100 ppb
- Timeline: Final Rule by 1/22/2010 (court order)

NAAQS – Future Revisions

SO2 Primary Standard:

- Proposal by 11/16/2009 (court order)
- Final NAAQS due 6/2/2010 (court order)

NO2/SO2 Secondary Standard:

- Proposal 2/12/2010 (court order)
- Final 10/19/2010 (court order)

CO NAAQS

- Final 5/13/2011 (court order)

NAAQS – Future Revisions
5 year schedule

PM2.5 Standard:

- Final NAAQS update due 10/2011

Ozone Standard:

- Final NAAQS update due March 2013

Lead Standard

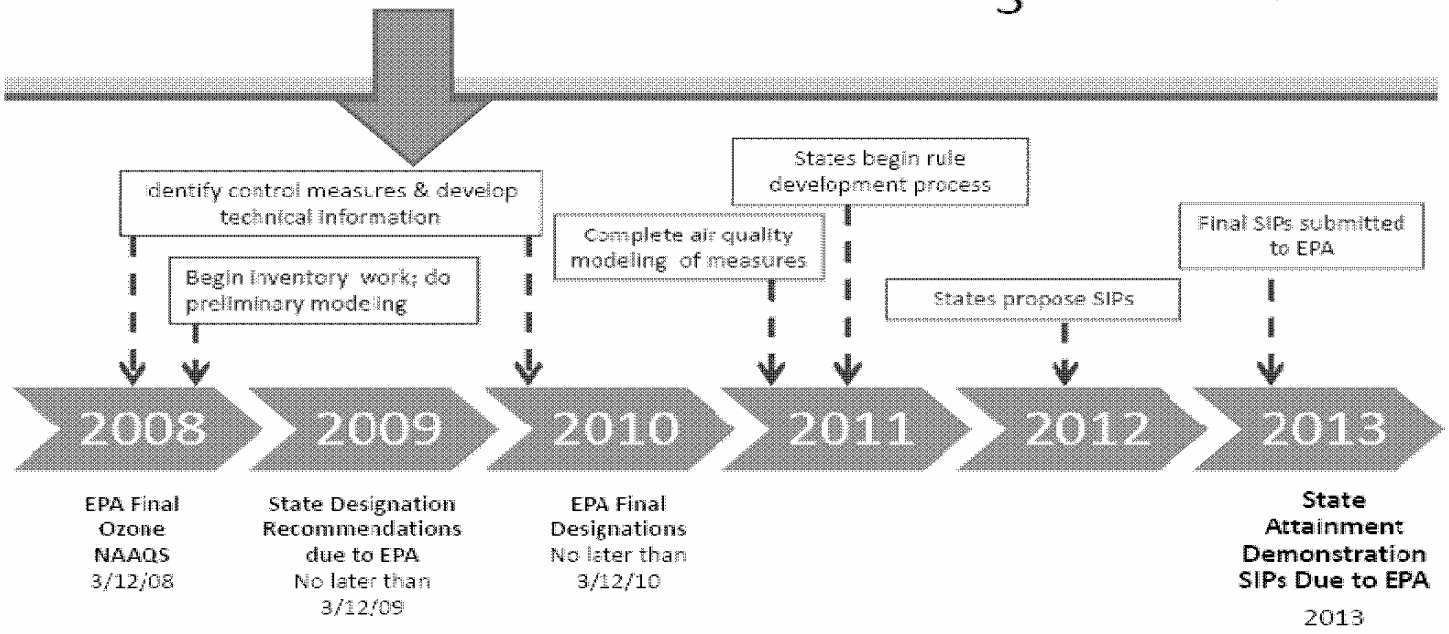
- Final NAAQS update due October 2013

Anticipated NAAQS Implementation Milestones

Pollutant	NAAQS Promulgation Date	Designations Effective	Attainment Demonstration Due	Attainment Date
$PM_{2.5}$ (2006)	Sept 2006	Nov 2009	Nov 2012	Nov 2014/2019
Pb	Oct 2008	Nov 2010/2011 (extra time for new monitors)	June 2012/2013	Nov 2015/2016
NO_2 (primary)	Jan 2010	Feb 2012/2013 ("unclassifiable" possible for most areas)	Aug 2014/2015	Feb 2017
SO_2 (primary)	June 2010	July 2012	Jan 2014	July 2017
Ozone	Aug 2010	Aug 2011	Dec 2013	Aug 2017 (Moderate)
CO	May 2011	June 2013	Nov 2014	May 2018
$PM_{2.5}$ (2011)	Oct 2011	Nov 2013	Nov 2016	Nov 2018/2023

June 2008 OTC Meeting

SIP Timeline for New O_3 NAAQS



2008 Ozone NAAQS Attainment Dates 2013 - 2030

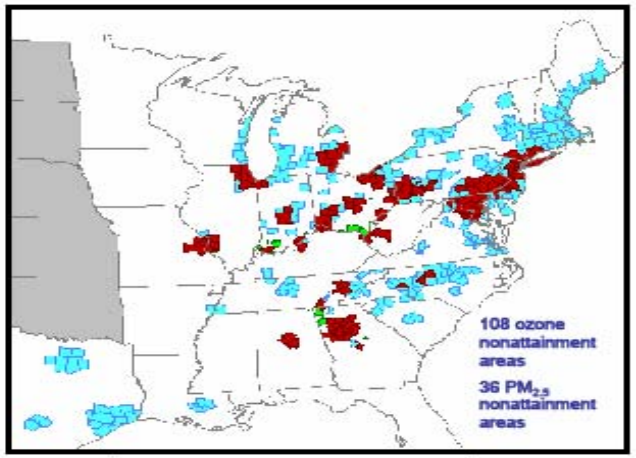
Combustion Issues

- CAIR
- CAMR
- NSPS
- Boiler MACT Issues

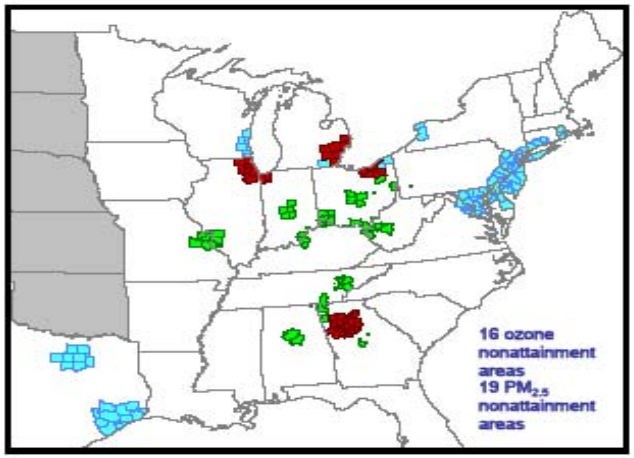
Impact of CAIR in 2010 1997 NAAQS

Ozone and Particle Pollution: CAIR, together with other Clean Air Programs, Will Bring Cleaner Air to Areas in the East - 2010

Ozone and Fine Particle Nonattainment Areas (April 2005)



Projected Nonattainment Areas in 2010 after Reductions from CAIR and Existing Clean Air Act Programs



Nonattainment areas for 8-hour ozone pollution only

Nonattainment areas for fine particle pollution only .

Nonattainment areas for both 8-hour ozone and fine particle pollution

Projections concerning future levels of air pollution in specific geographic locations were estimated using the best scientific models available. They are estimations, however, and should be characterized as such in any description. Actual results may vary significantly if any of the factors that influence air quality differ from the assumed values used in the projections shown here.

Impacts of CAIR – 2015 on 1997 NAAQS

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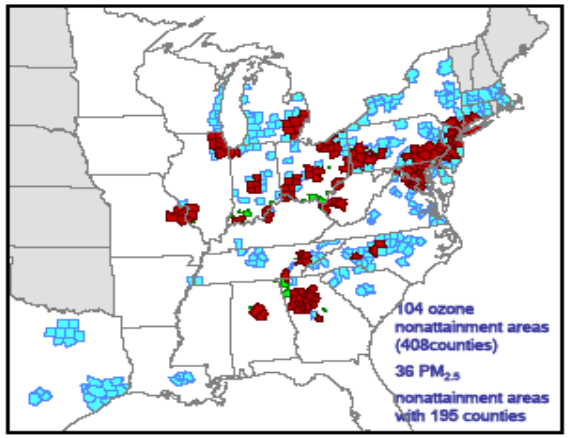

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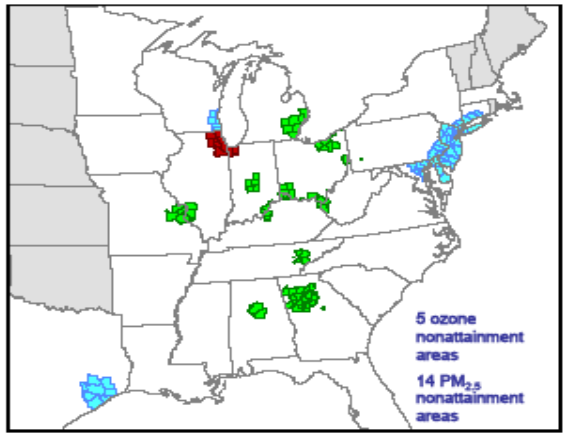

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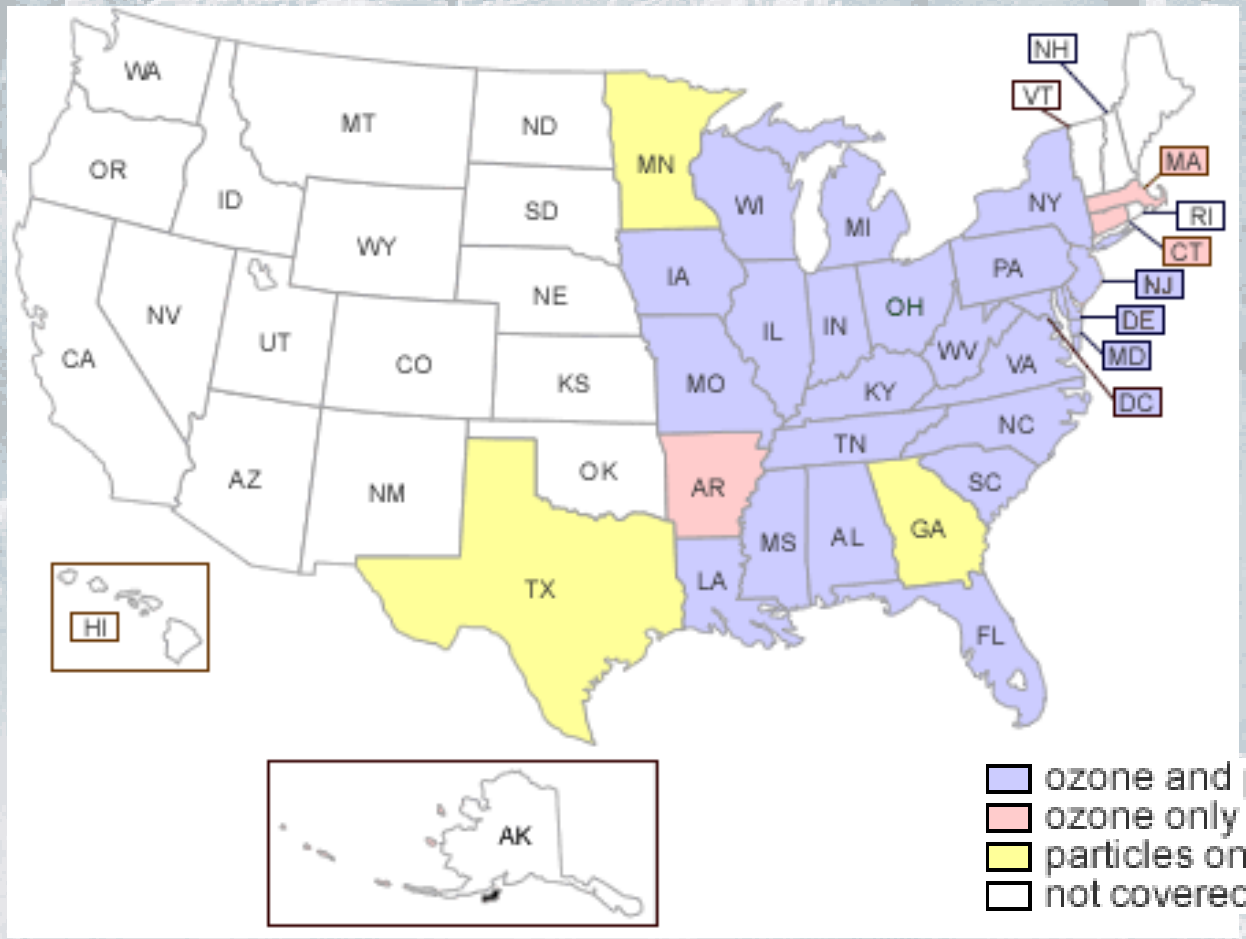
CAIR (Clean Air Interstate Rule)

- Utility rule for phased SO2/NOx reductions intended to help with O3 and PM 2.5 attainment
  - Extended use of Acid Rain allowances
- CAIR emission reductions also intended to provide Regional Haze improvement
  - CAIR = BART for utility units
  - CAIR also key to meeting visibility glide slope demonstrations for many areas

States Covered by CAIR



Court Remand of CAIR

- Significant contribution issue
  - Based on highly cost effective control levels
  - Not used as the basis for state budgets
- Phase 2- 2015 deadline failed to ensure downwind states had time to achieve attainment
- EPA did not have authority to change Title IV Acid Rain allocations

Related Issues

- CAMR- Clean Air Mercury Rule
  - Used CAIR co-benefits for Phase 1
  - 70% reduction for Phase 2
  - Also vacated/remanded by DC Circuit Court
- Revised NAAQS drive need for increased emissions reductions
- Regional Haze in limbo/progressing slowly
- Carper Bill in the wings (90% Hg reduction)
- Climate Change legislation
- Continued enforcement initiatives

CAIR Replacement Rule

- EPA is working to propose a new CAIR replacement rule early in 2010
- Serious consideration of including ICI boilers in the rule
  - Strong push by NACAA and states
  - OTC & LADCO also pressing for ICI boiler controls
  - CIBO and other industrial groups met with EPA early in 2009 to discuss potential inclusion and issues

CAIR EGU Issues

- Potential level of SO2/NOx reductions
  - Likely more stringent than CAIR
- Whether BAT should be required on every unit or just largest
- Timing of controls
- Whether trading (including intrastate trading) is allowed per the court decision
- Can new CAIR forestall Sec. 126 petitions
- Utility MACT- Hg plus other HAPs- more stringent without trading

EGU Approach
Impact on Industry

- Increased cost of electricity to cover utility control costs
- Potential inclusion of certain cogen units in utility requirements
- Strong driver toward increased natural gas generation driving up demand and price
- However, would assist in attainment

Potential ICI Boiler Limits

- OTC and LADCO pressing for reductions
- Much analysis and modeling
- CIBO had provided input regarding technology and costs
- Looking for phased reductions
  - Phase 1 2012-2015
  - Phase 2 2015-2018

OTC Workgroup NOx Limits

Phase 1- 2012-15 Phase 2- 2015-18

		Boiler Size (MMBTU/Hour)		
Fuel Type		**< 50**	**50-100**	**> 100**
Gaseous Fuels (natural gas, rofinory gas, blast furnace gas, coke oven gas)	Phase I	Comb. Tuning	Comb. Tuning	0.10 or 50%
	Phase II	0.05 - 0.10 or 50%	0.05 - 0.10 or 60%	0.05 - 0.10 or 60%
Distillate Oil (#1.#2)	Phase I	Comb. Tuning	Comb. Tuning	0.10 or 50%
	Phase II	0.08 - 0.10 or 50%	0.08 - 0.10 or 60%	0.08 - 0.10 or 60%
Residual Oil (#4,#5,#6)	Phase I	Comb. Tuning	Comb. Tuning	0.20 or 60%
	Phase II	0.20 or 50%	0.20 or 60%	0.20 or 70%

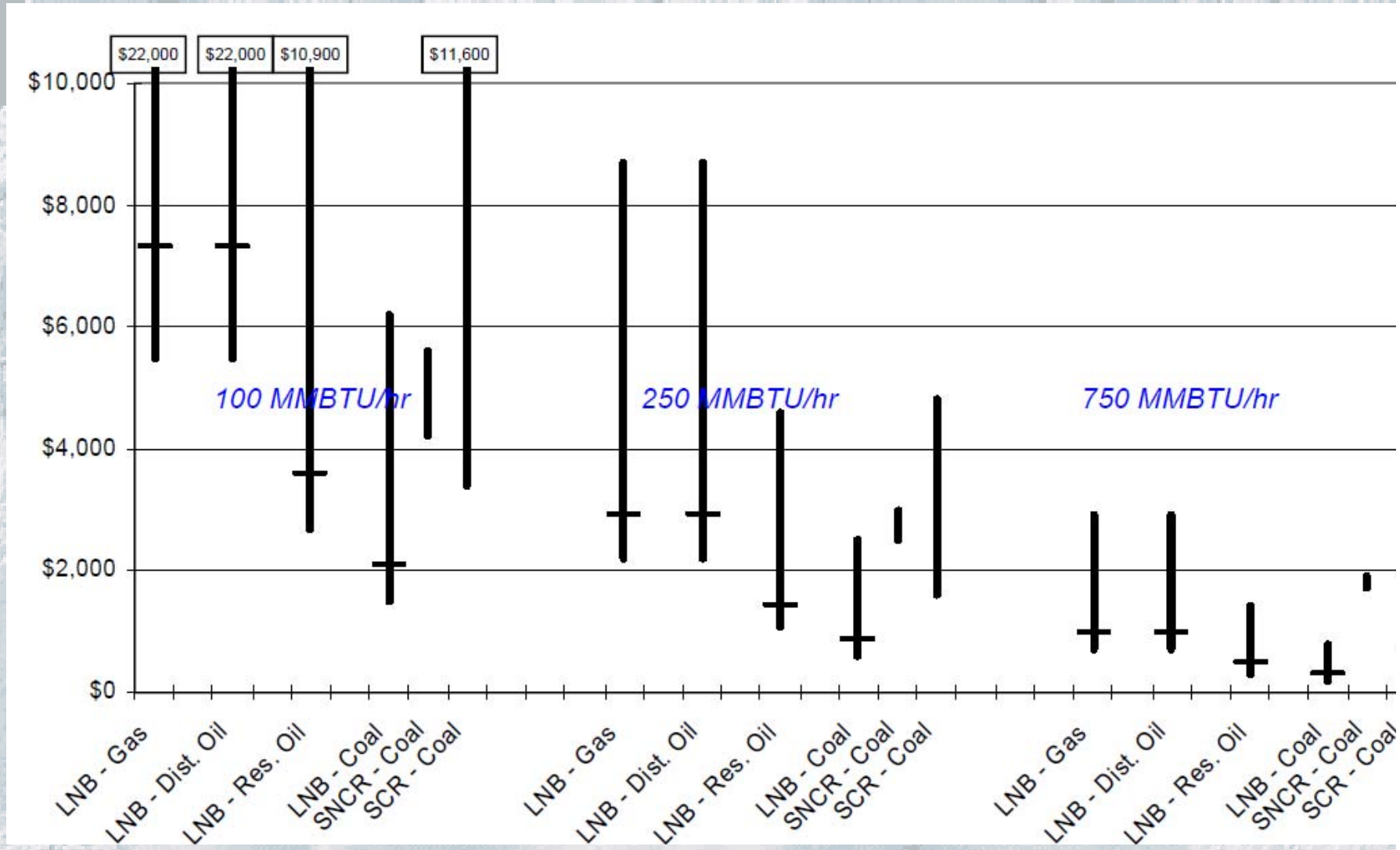
OTC Workgroup NOx Limits

Phase 1- 2012-15 Phase 2- 2015-18

Fuel Type		Boiler Size (MMBTU/Hour)		
		< 50	50-100	> 100
Coal - Wall	Phase I			0.30
	Phase II			0.10 - 0.14
Coal - Tangential	Phase I			0.30
	Phase II			0.10 - 0.12
Coal - Cyclone	Phase I			0.19
	Phase II			0.19
Coal - Stoker	Phase I		Comb. Tuning	0.30
	Phase II		0.30	0.22
Coal - FBC	Phase I		Comb. Tuning	0.15
	Phase II		0.08	0.08
Wood and Non-Fossil Solid Fuel	Phase I		Comb. Tuning	0.30
	Phase II		0.30	0.22

NOx Cost Effectiveness

66% Capacity Factor



OTC Workgroup SO2 Limits

Phase 1- 2012-15 Phase 2- 2015-18

Fuel Type		Boiler Size (MMBtu/Hour)			
		< 50	50-100	100-250	> 250
Distillate Oil (#1, #2)	Phase I	0.05%S (500ppm), or 0.05 lb/MMDTU	0.05%S (500ppm), or 0.05 lb/MMDTU	0.05%S (500ppm), or 0.05 lb/MMDTU	0.05%S (500ppm), or 0.05 lb/MMDTU
	Phase II **Northeast States Inner Zone**	Further reduce Sulfur content to 15ppm by 2016	Further reduce Sulfur content to 15ppm by 2016	Further reduce Sulfur content to 15ppm by 2016	Further reduce Sulfur content to 15ppm by 2016
	Phase II **Elsewhere**	Further reduce Sulfur content to 15ppm by 2018	Further reduce Sulfur content to 15ppm by 2018	Further reduce Sulfur content to 15ppm by 2018	Further reduce Sulfur content to 15ppm by 2018
Residual Oil (#4, #5, #6)	Phase I	0.5%S (or 0.54 lb/MMBTU)	0.5%S (or 0.54 lb/MMBTU)	0.5%S (or 0.54 lb/MMBTU)	0.5%S (or 0.54 lb/MMBTU)
	Phase II **Northeast States Inner Zone**	#4 Fuel Oil 0.25%S no later than 2012	#4 Fuel Oil 0.25%S no later than 2012	#4 Fuel Oil 0.25%S no later than 2012	#4 Fuel Oil 0.25%S no later than 2012
		#6 Fuel Oil 0.3-0.5% no later than 2012	#6 Fuel Oil 0.3-0.5%S no later than 2012	#6 Fuel Oil 0.3-0.5%S no later than 2012	#6 Fuel Oil 0.3-0.5%S no later than 2012
	Phase II **Elsewhere**	#4 Fuel Oil 0.25-0.5%S no later than 2018	#4 Fuel Oil 0.25-0.5%S no later than 2018	#4 Fuel Oil 0.25-0.5%S no later than 2018	#4 Fuel Oil 0.25-0.5%S no later than 2018
		#6 Fuel Oil 0.5%S no later than 2018	#6 Fuel Oil 0.5%S no later than 2018	#6 Fuel Oil 0.5%S no later than 2018	#6 Fuel Oil 0.5%S no later than 2018

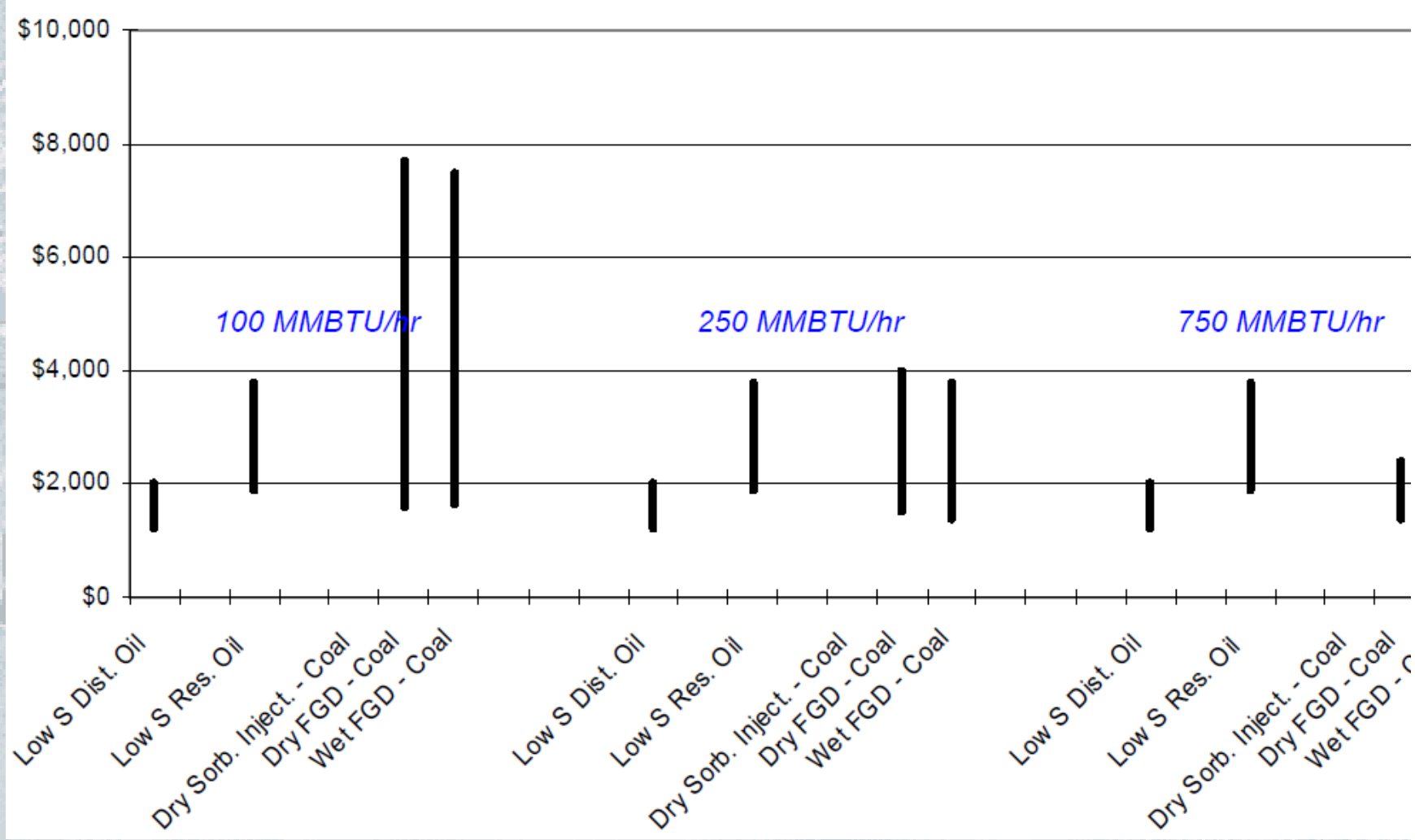
OTC Workgroup SO2 Limits

Phase 1- 2012-15 Phase 2- 2015-18

		Boiler Size (MMBtu/Hour)			
Coal (and other solid fuels)	Phase I		2.0 lb/MMBtu or 30% reduction*	1.2 lb/MMBtu or 85% reduction*	0.25 lb/MMBtu or 85% reduction*
	Phase II		2.0 lb/MMBtu or 30% reduction*	0.25 lb/MMBTU or 85% reduction*	0.25 lb/MMBTU or 85% reduction*
			* = % reduction based on uncontrolled emissions in base year (2002)		

SO2 Cost Effectiveness

66% Capacity Factor



CIBO General Position

- Non-EGU sources should be modeled to see actual downwind impact
- Do not require general reductions from non-EGU sources
- Allow non-EGU sources to opt-in to CAIR replacement program
- Target emissions reductions through state SIP process if a significant downwind impact is shown

NSPS

- EPA is reviewing utility unit NSPS
  - Determining whether CO2 limits to be included
  - Probably reviewing other limits as well
- Wholly within their ability to also review and modify industrial boiler requirements
- Climate change bills require NSPS for most non-covered sources

Boiler MACT Issues

- Solid waste definition
- Emissions test data
- MACT Floor methodology
- SSM
- Timing and 112(j) implementation

Boiler MACT Issues- Status

- Timing of proposal on Boiler/Process Heater revised MACT & CISWI tied to Industrial Boiler Area Source Rule
  - Drives common timing through court orders
- Latest extension- propose by April 15, 2010; final promulgation by December 16, 2010
  - Typical MACT compliance 3 years following promulgation
- EPA OSW Solid Waste definition critical for MACT vs CISWI applicability

Solid Waste Definition

- EPA requiring many units to test for CISWI emissions t cover potential inclusion in CISWI
- Conventional biomass likely not solid waste vs sludges likely solid waste
  - Dependent on how material is handled- discard
- Tremendous number of shades of gray that need to be classified
- Can have major impact on fuel availability and materials disposal
- Proposed rule should be prior to MACT proposal to allow Floor determinations

Emission Test Data

- Verification/analysis of new emissions data
  - Potential interferences with FTIR
  - How to use with existing database
- Need to do independent analysis of data
- Need to evaluate variability of emissions vs independent variables such as fuel quality
- Need to evaluate HAP emissions vs surrogates
  - PM vs metal HAPs
  - CO and THC vs organic HAPs

MACT Floor Methodology

- Portland Cement MACT; HMIWI MACT
- "EPA estimation of 99 percent confidence intervals for MACT floor data sufficiently accounts for variability"
- Floor levels established independently
  - MACT Floor for existing sources no less stringent than emission level achieved by average of best performing 12% of existing sources for subcategories with 30 or more sources
  - For new sources- no less stringent than best controlled similar source
- Likely loss of HBCA approach
- Methodology combined with data will likely result in significantly lower emissions limits

MACT- SSM

- Court decision determined General Provisions SSM approach is not allowed
- EPA is providing limits during SSM periods
- Emissions test data may provide limited data on performance during SSM periods
  - But full testing is not feasible during SSM for combustion equipment
- Operating practices are most appropriate for boiler SSM periods

Boiler MACT Decision (7-19-07)

- Vacated CISWI Definition Rule
- CAA language is unambiguous; solid waste incineration unit = distinct operating unit of any facility which combusts any solid waste
- Vacated Boiler MACT
- Did not address merits of "other" Boiler MACT issues

Does 112(g)/(j) apply?

- 4 possible answers:
  - No; it was a one-time provision that became moot when EPA adopted standards.
  - Yes; any standards adopted by EPA under the Act must meet the statutory requirements and if a court vacates the standard in its entirety.
  - No; The vacated standard essentially removes the source category. Therefore, no category exists for which the hammer may fall!
  - Maybe; Some believe it is self initiating at Title V reopening

To Revise the Boiler MACT

- 112(j) Still at OMB
- EPA received OMB approval to issue CAA Section 114 Request for data from Boiler MACT covered sources to write revised Boiler MACT (8/01/08) over 2500 responses to date -- Part II responses from around 300 sources – Mos are Due October 15, 2009.
- EPA has proposed a Rule Making time line for Boiler, CISW and Area Source MACTs -- Proposed Rule by 4/16/10 and a Final Rule by 12/16/10
- OSW issued ANPR on a Fuel/Waste Definition 1/2/09

To Do What????

- **Industry could have 5 different standards regulat their boilers:**
  - State Boiler MACT Standards
  - EPA 112(g)/(j) – Hammer Process
  - Re-written Federal Boiler MACT Standard (Will the MA floors be lowered?)
  - Re-written Commercial Industrial Solid Waste Incinera (CISWI) Standard
  - Area source MACT Standard

State Activity Under 112(g)/(j)

- **No consistency among states or EPA Regions**
- **States anticipating EPA guidance or rule, and some are delaying action pending that guidance or a Proposed Rul**
- **EPA guidance rumored to be forthcoming**
- **A rule is coming (When?)**
- **NACAA comes to the Rescue**

Timing and 112(j) Implementation

- Delay in EPA rule proposal/promulgation might give incentive to states to push Title V permit modifications to include Boiler MACT provisions
- Some states are moving on 112(j) case-by-vase MACT for Boilers and Process Heaters
  - NC
  - NJ
    - Required to submit application for Title V significant modification by January 1, 2010
    - Comply with presumptive MACT or prepare a case-by-case MACT
    - Comments on draft presumptive MACT by 10/21/09

NC Part 2 MACT "Hammer" Application Guidance

- While the North Carolina Part 2 MACT "Hammer" Application Guidance is reasonable and could be a good guide for all states to follow, there are concerns. Here are a couple:
  - There is very little coal capable of meeting the Hg limit as set forth in the guidance, with no guarantees.
  - Older stoker and biomass fired boilers could have problems meeting CO limits for any solid fuel firing when trying to meet NOx emission limits at maximum efficiency.

Waste Issues

- Two Issues
  - Managing Coal Combustion Byproducts
  - High TDS Waste Water

Coal Combustion Byproducts

- A Lesson in the Art of Political **"Science"**
- From EPA's failure to promulgate regulations for the management of CCBs under to Subtitle D of RCRA
- To EPA proposing to regulate CCBs under Subtitle C of RCRA

What happened?

- First EPA put the development and promulgation of regulations for the management of CCBs on the back burner.
- The Industry pushed for a non-regulated program using guidance not regulations
- The State Regulators were improving their regulatory programs
- A major push for recycling and beneficial use of CCBs

What happened? (continued)

- The Environmental Community
  - pushed and were rewarded an NAS study
  - continued to research and fine situations to criticize the on-going management of CCBs
  - made allegations of pollution problems
  - Made allegations of failure to enforce
  - CONTINUED TO QUOTE (FROM THEIR PERSPECTIVE) WHAT THEY BELIEVED TO BE THE RECOMMENDATIONS MADE IN THE NAS STUDY ON CCBs IN MINES
  - TVA's DAM FAILURES RELEASING CCBs UNCONTROLLED INTO THE ENVIRONMENT

What is the key driver?

- A key recommendations in the NAS Study was to develop a Federally Enforceable Permit utilizing either RCRA or SMCRA
- The Environmental Community, EPA staff, and Congress were calling for Federally Enforceable Permits

Timing and Expectations

- EPA Administrator Lisa Jackson promised Congress to propose regulations governing CCBs by the end of 2009
- IT is anticipated that EPA will send to OMB a draft to regulate CCBs under Subtitle C
- At the same time EPA will solicit comments on regulating CCBs under Subtitle D or maybe a hybrid of C and D
- Finalize the regulation package by October, 2010

Other Actions

- The Environmental Integrity Project had given EPA a 60-day notice of its intent to sue over failure to review and update effluent guidelines for the Electric Power Generating Units
- The Citizens Coal Council had given DOI/OSMRE a 60-day notice of its intent to sue over OSMRE failure to insure that Pennsylvania was implementing it approved program and directed it comments that both PA-DEP and OSM were allowing toxic ash to be illegally disposed in coal mines.

High TDS Waste Water

- Water Quality Standards for Surface Water generally contain protections for potable water supply intakes of 500 mg/l of TDS, 250 mg/l of sulfates, and 250 mg/l of chlorides.
- There are watershed problems regarding these pollutants.
- The issue has been evaluated by a few states. However, the development of new oil and gas reserves has focused regulators to look at the situation more closely.

Issue for PA and WV

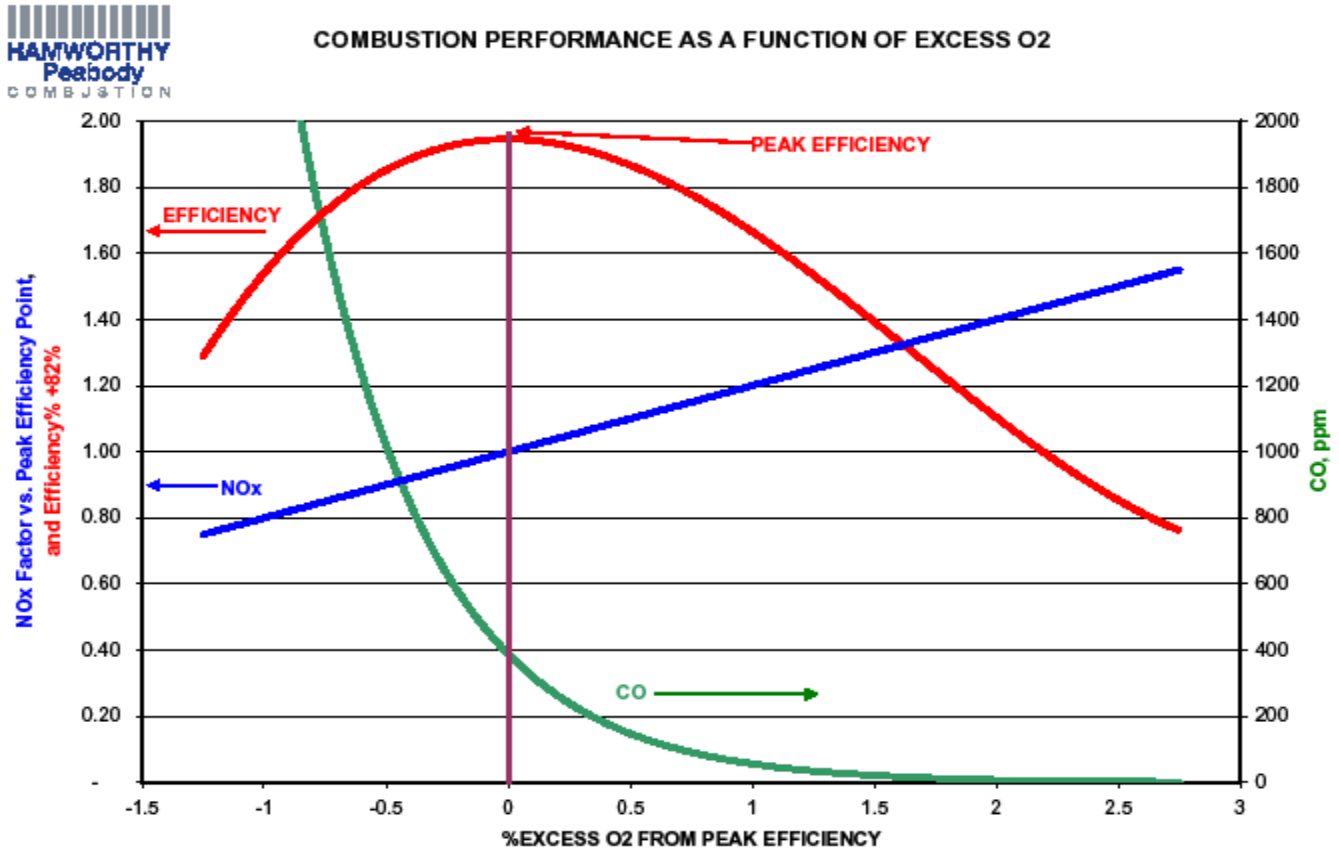
- Low flow water quality problems possibly resulting in TMDLs for certain streams and rivers
  - The Problem Recognized in the Monogahela River
  - TDS and Sulfates are present water quality problem
  - Concern that brine disposal of water associated with the development of the wells, frac' water back-flow and production waters

Actions Pending

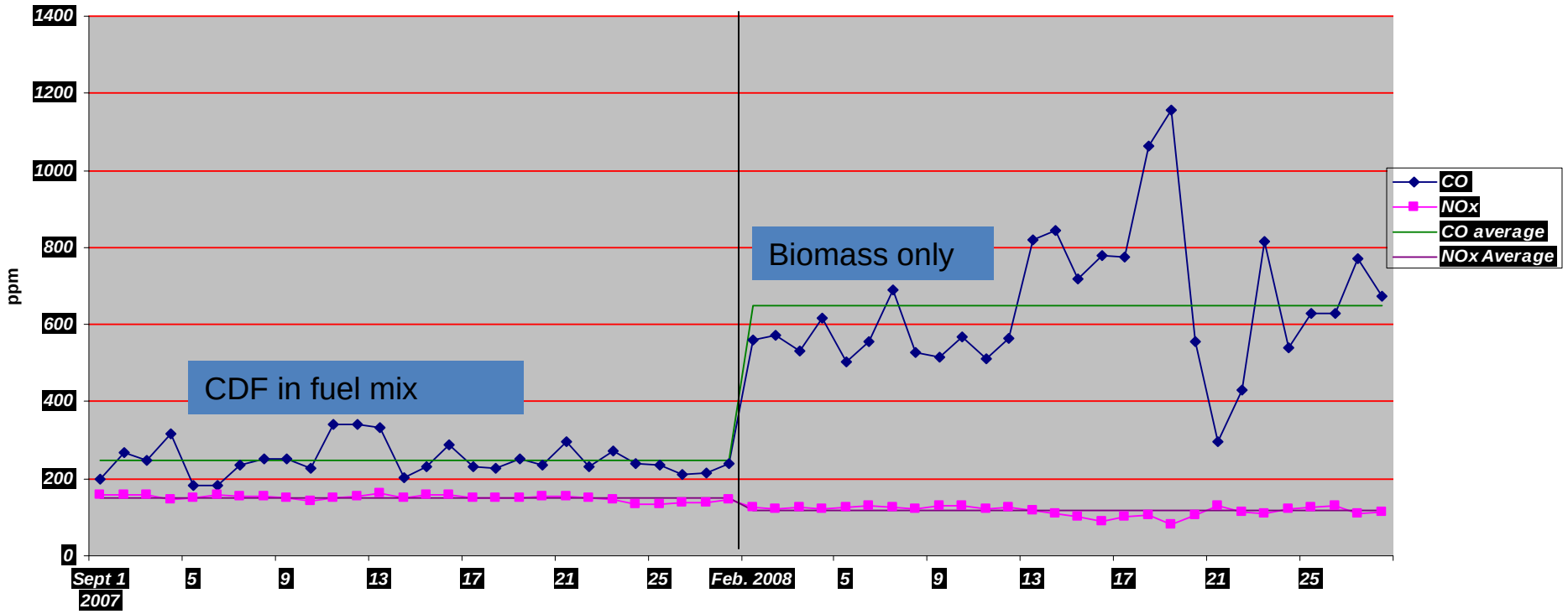
- End of Pipe Effluent Limitations
  - PA and WV are placing effluent limits in permits of 500 mg/l of TDS; 250 mg/l of sulfates; and 250 mg/l of chlorides
- Proposing regulation
  - End of pipe effluent limitations
  - In stream chloride standards

Problems

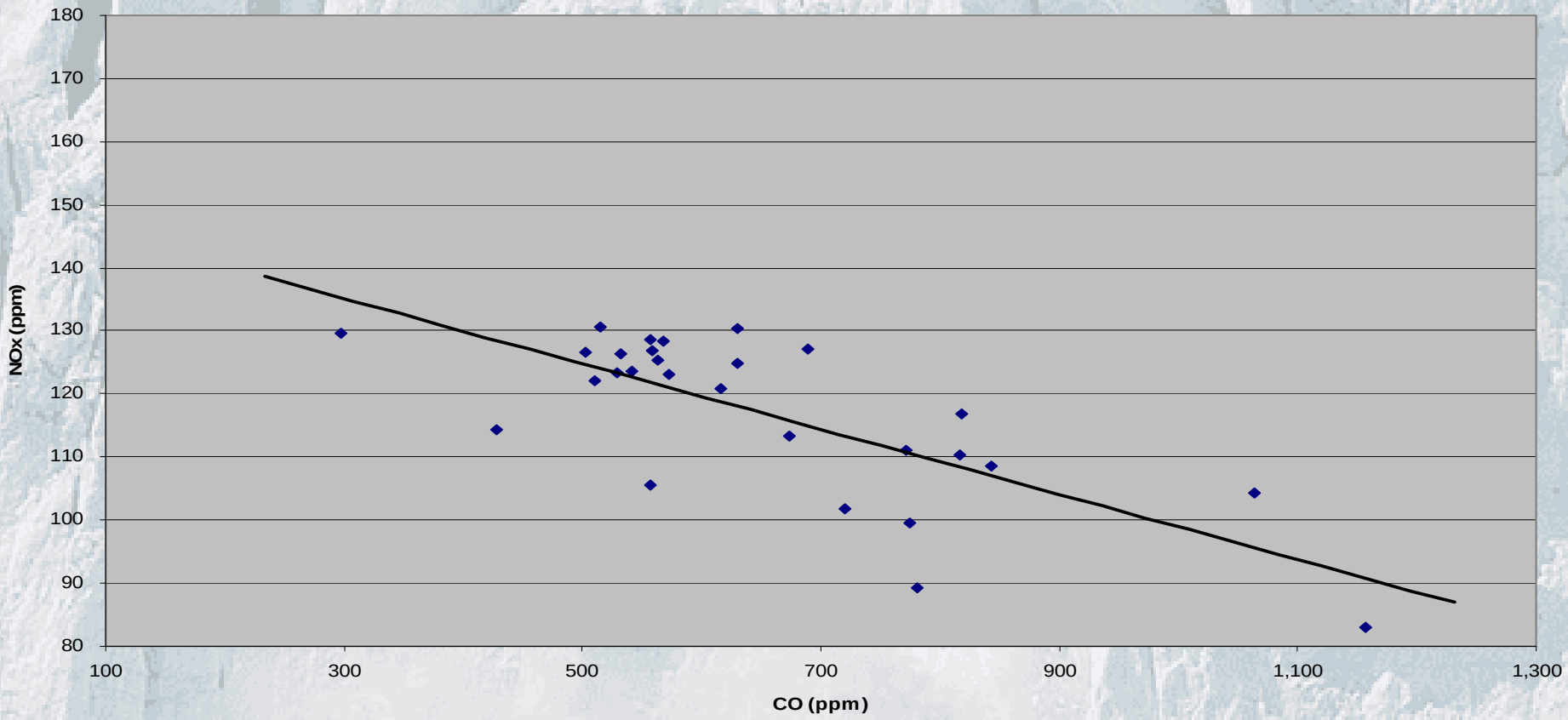
- Cost of Treatment
- Disposal of residual wastes produced
- Energy costs


HAMWORTHY
Peabody
COMBUSTION
COMBUSTION PERFORMANCE AS A FUNCTION OF EXCESS O2
PEAK EFFICIENCY
EFFICIENCY
NOx
CO
NOx Factor vs. Peak Efficiency Point,
and Efficiency% +82%
CO, ppm
%EXCESS O2 FROM PEAK EFFICIENCY
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
-
2000
1800
1600
1400
1200
1000
800
600
400
200
0
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
3

Red Shield - Boiler #6
CO and NOx daily trend graphs
Sept. 2007 & Feb. 2008



Red Shield - Boiler #6,
NOx vs CO (ppm) at 100% biomass
Feb. 2008



Where has all the energy gone?

- Burn coal???
- Wind and solar??
- Biomass/Boifuels may be ok, if they are fuels.
- Natural gas is the current conventional fuel of choice if you can get it.
- Where have all the “Boiler Guys” gone??
- Climate Change proponents say, make bricks without straw…

What do the owners need?

- Certainty
  - That they will not have to waste Dollars spent doing something over again in an unreasonable amount of time.
  - That those Dollars spent will have real health benefits.
- Flexibility
  - That the idiosyncrasies of older units/technologies will be addressed.
- Reasonability
  - That it is actually possible to achieve compliance with all emission limits at the same time and over full operating range of the units.
  - That any regulation will consider the direct and indirect impacts on the ability to comply with other emission regulations -- existing or future.
- Assurance
  - That no good deed will be punished.