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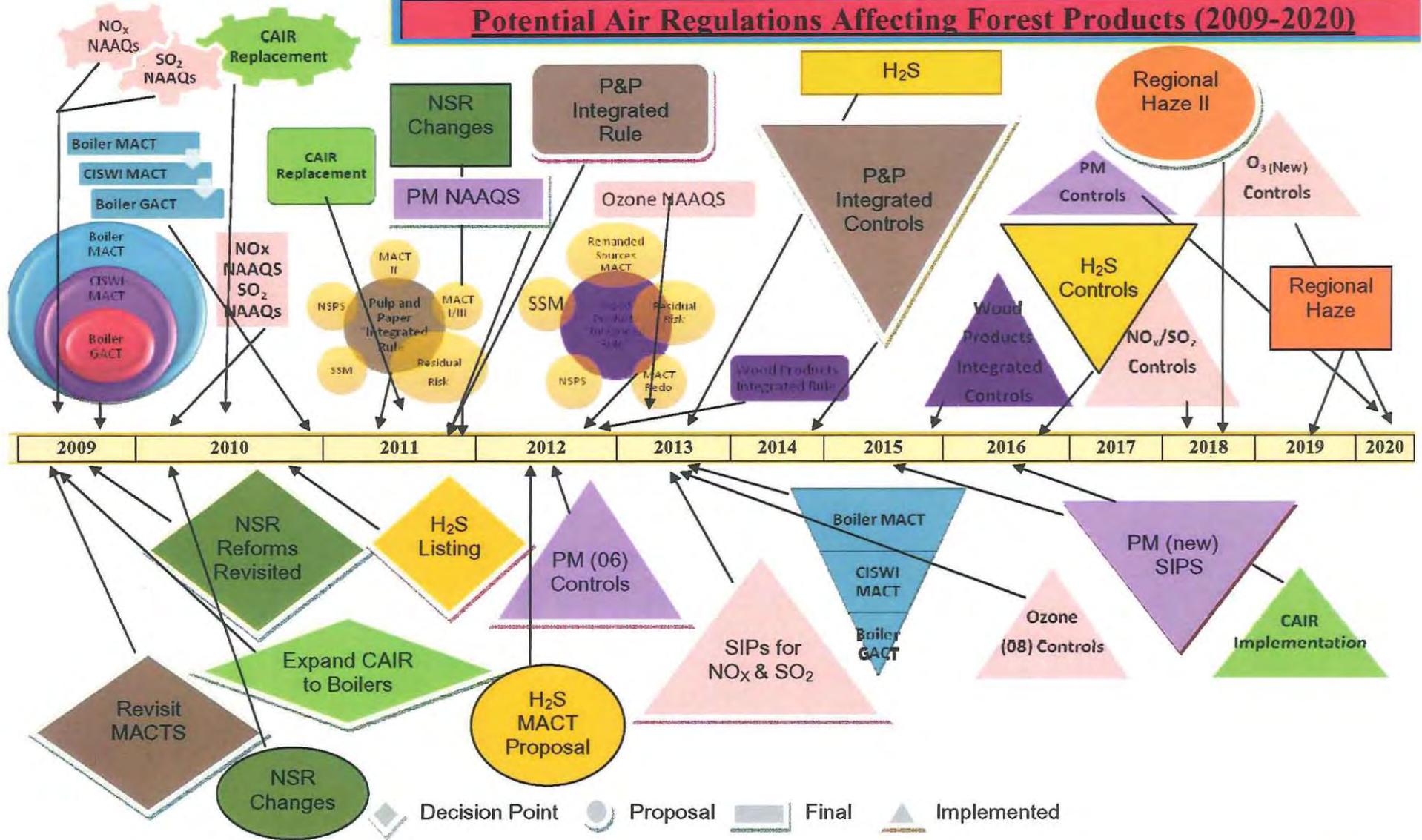
Boiler MACT

March 19, 2010



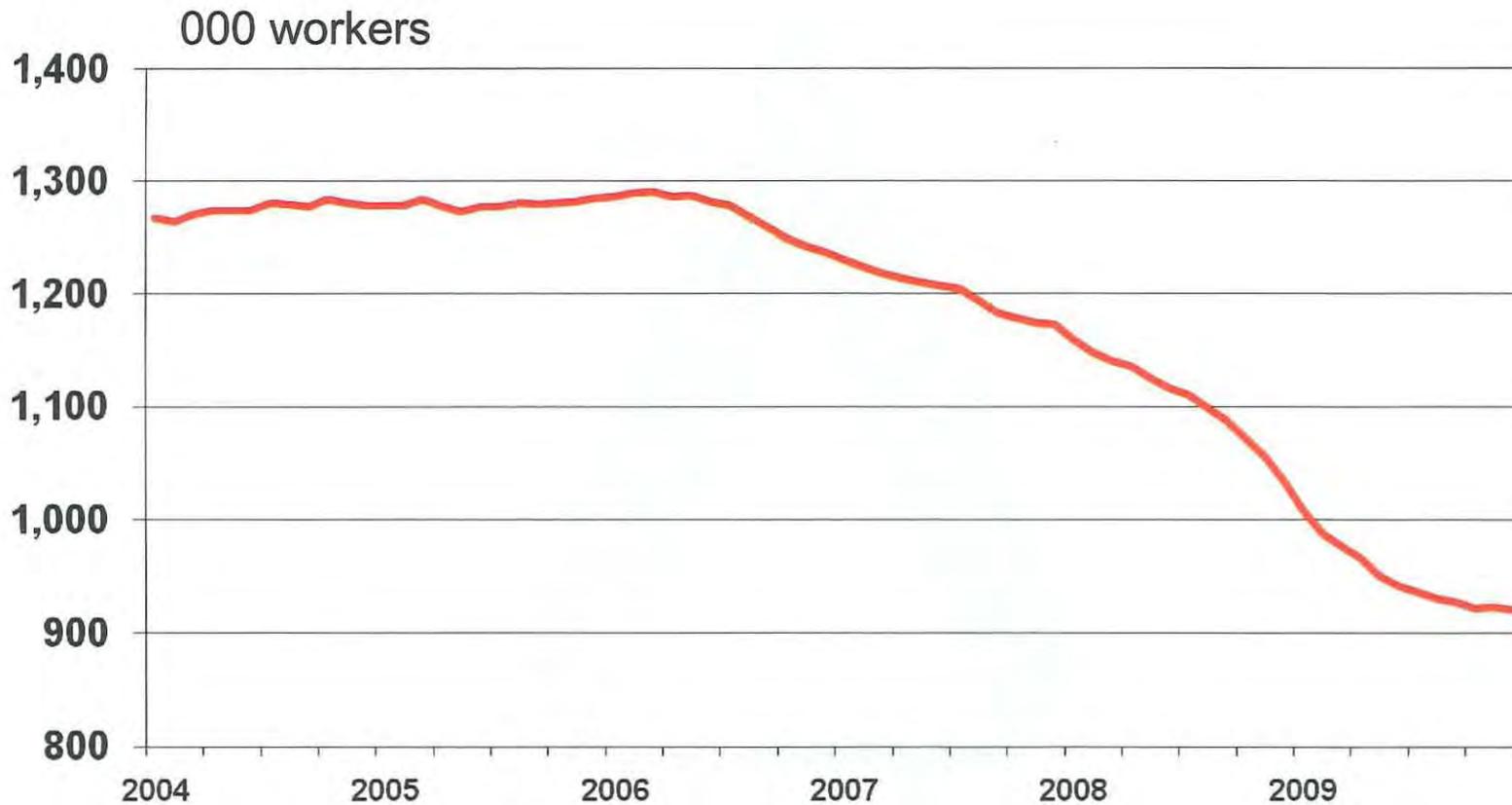
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Potential Air Regulations Affecting Forest Products (2009-2020)



Boiler MACT	CAIR	P&P Integrated	WP Integrated	NSR	H ₂ S	PM	Ozone	NO _x	SO ₂	Haze II
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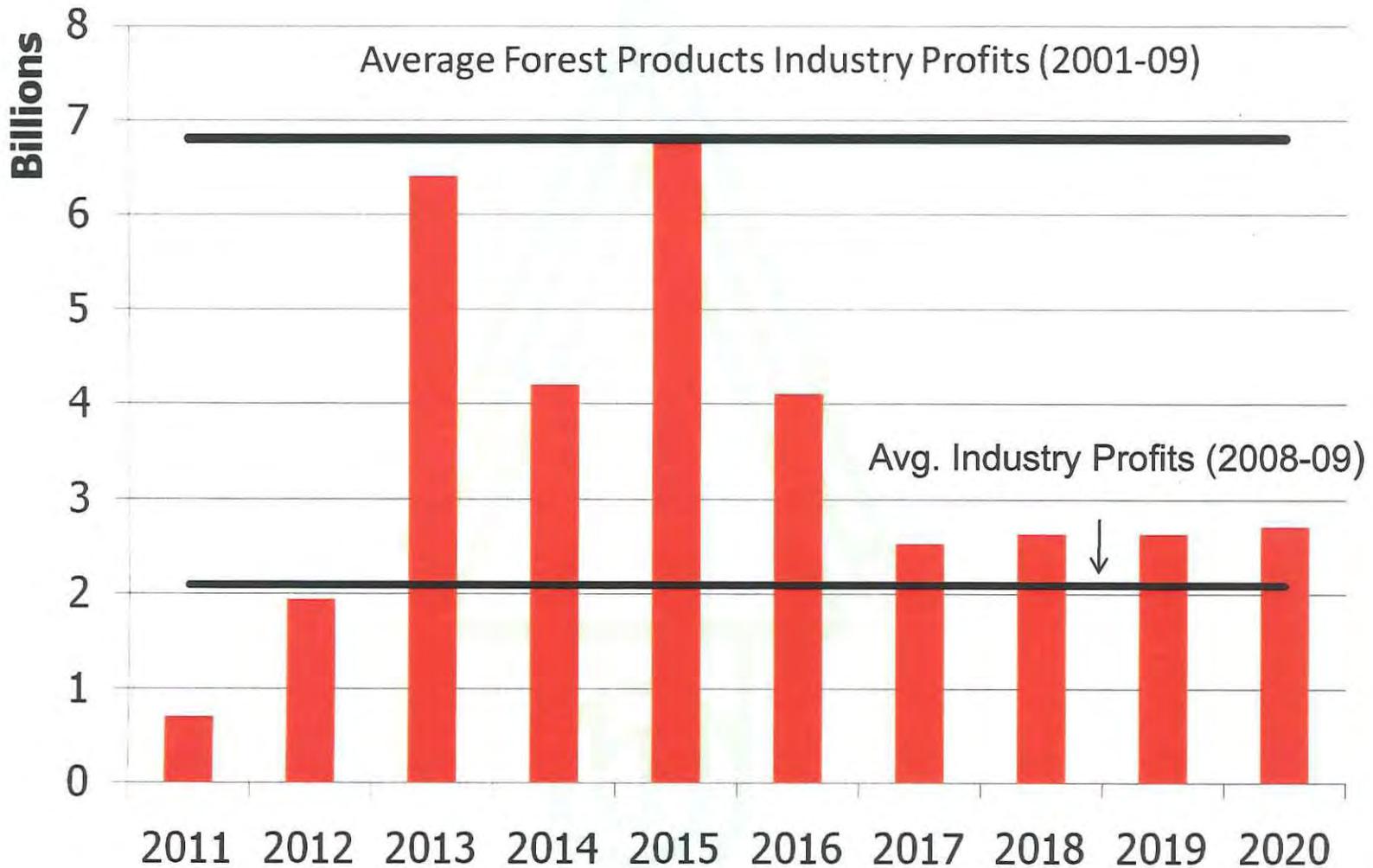
Forest Products Industry Employment*



* Includes paper and allied products, wood products, and logging.

Source: Bureau of Labor Statistics

Cost of New Air Regulations: Capital (\$17 B) Plus Operating Expenses



Boiler MACT Impacts

- Limits will be costly and with few air toxic benefits
 - \$6 billion for forest products - conservatively
 - \$10's billion (25 to 50 B?) nationally for all industries
 - Hits biomass, gas, oil and coal units equally
- Five pollutants/five different controls:
 - Metals (PM) – ESPs or bag houses/fabric filters (\$5M)
 - HCl/acid gases – scrubbers (\$8M)
 - Mercury – carbon injection (with PM controls)
 - Organics (CO surrogate) – CO catalyst or fuel switching
 - Dioxin – combustion controls, carbon injection/PM controls

Key Boiler MACT Problems

1. Ignores important boiler performance variability even among top performers
 - Not all boilers created equally – design, fuel, application, load swing, control performance, etc.
 - Subcategorization helps but is not enough given diversity
2. EPA relying on data at the limit of detection
 - Essentially zero for many units
 - Cleaner fuels get lowest limits – natural gas, biomass; achievable?
3. Not actual real-world boilers
 - Selective Use of Biased Data
 - Many limits based on five data points – not representative

Well - Established Legal Standards

- MACT = [new] “maximum degree of reduction in emissions that is deemed achievable [and] shall not be less stringent than is achieved in practice by the best controlled similar sources” CAA §112(d)(3)
- MACT = [existing] “shall not be less stringent than ... the average emission limitation achieved by the best performing 12 percent of the existing sources” CAA §112(d)(3)(A)
- “may distinguish among classes, types and sizes of sources” CAA §112(d)(1)
- for threshold pollutants “may consider such threshold level, with an ample margin of safety ...” CAA §112(d)(4)

Suggested Revisions

Consistent with EPA OCG's "Do's and Don'ts"

Interpreting recent DC Cir Losses (e.g. *Sierra Club-Brick* MACT)

"EPA must ...

- **"reasonably estimate levels of toxics emitted by best performing sources"**
 - ✓ Increased importance of flexibility after recent court losses

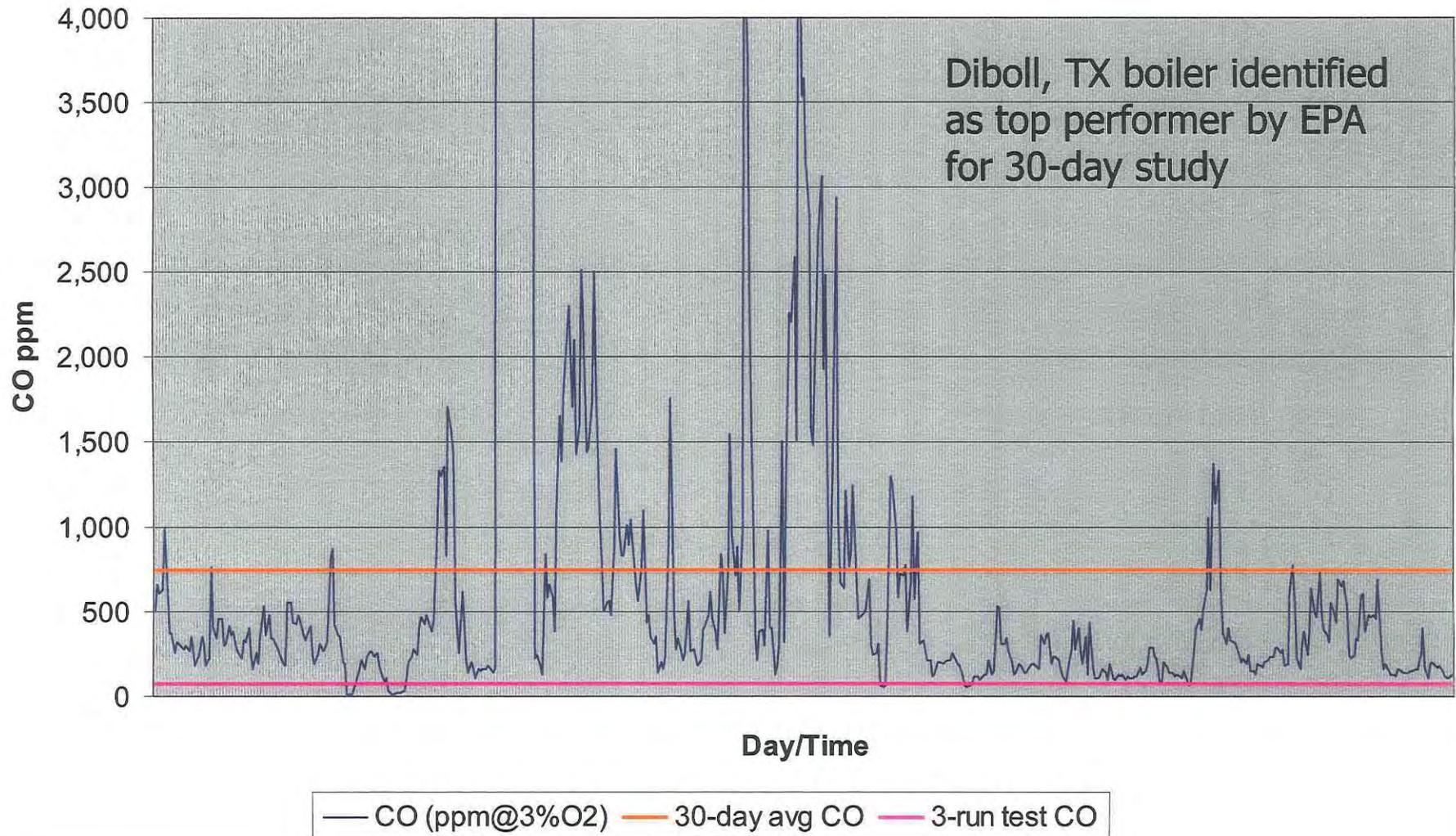
"EPA may ...

- **"Estimate variability in emissions achieved by best performing sources"**
- **"Distinguish between classes, types and sizes of sources."**

Source: Perciasepe Hand-Out 3-10-2010 "Maximum Achievable Control Technology (MACT) Standards Fact Sheet for Small Business Trade Association Meeting with EPA Deputy Administrator"

Variability Critical

Biomass Boiler CO - 30 Day Data vs. 3-run Test Data

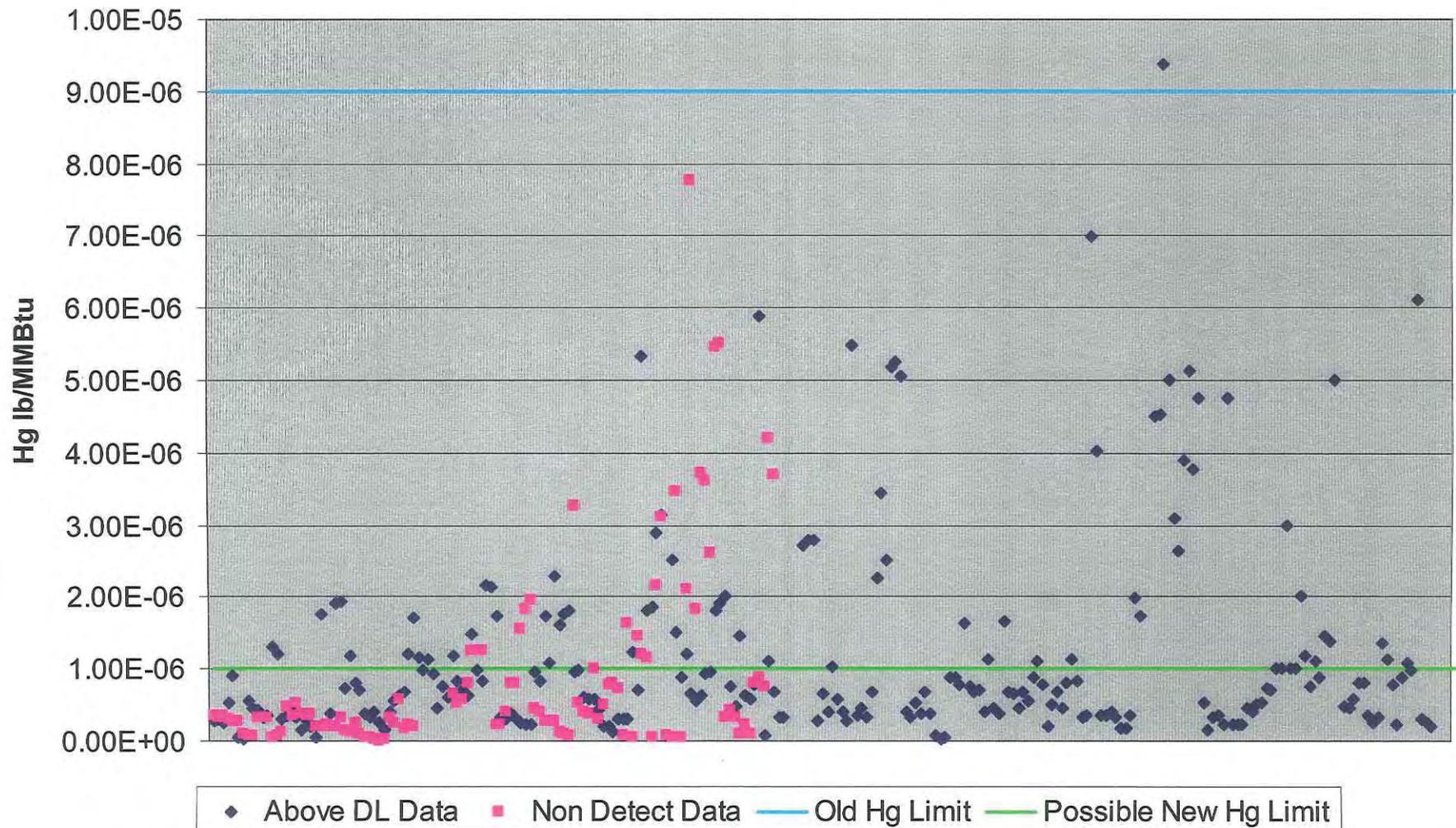


Are Proposed Limits “Achievable”?

- Biomass
 - Mercury and HCl levels inherently low compared to coal
 - Dioxin limits could be at limits of detection
 - CO/organics limits could fail to recognize wet biomass
- Gas-fired
 - Units don't have controls so no clear path to meet
 - PM, mercury and HCl present in very small quantities
- Perverse Outcomes
 - Use higher emission fuel to get better limits: Biomass to coal

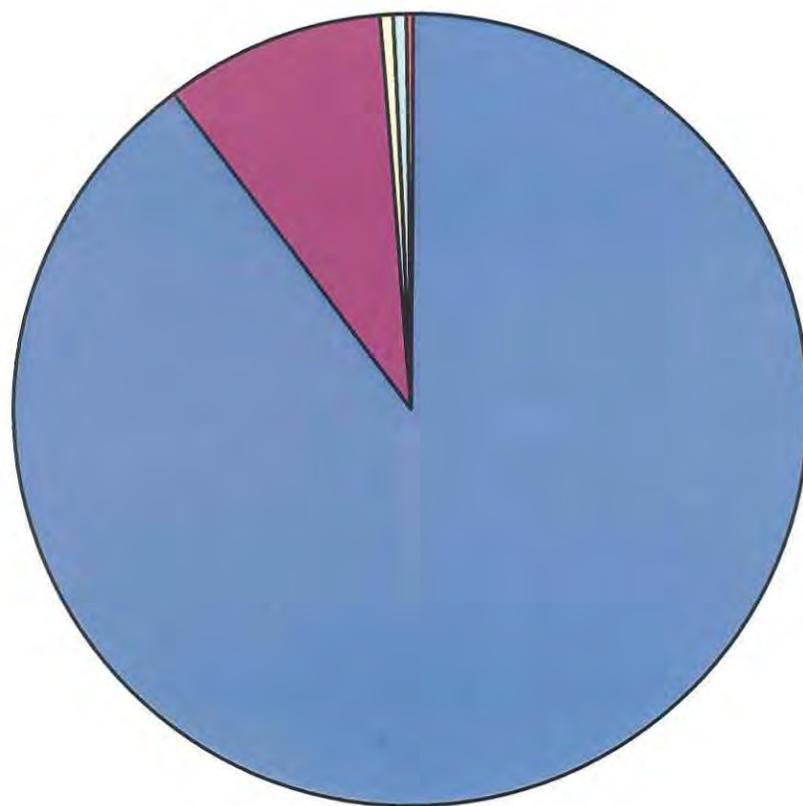
Biomass Mercury Data Problems

Biomass Boiler Hg Data



HCl Emissions – Small contributors

2005 US Emissions of HCl by Boiler Type



- Utility Boilers: Coal
- ICI Boilers & Process Heaters - coal
- ICI Boilers & Process Heaters
- ICI Boilers & Process Heaters - wood or waste
- Utility Boilers: Oil
- ICI Boilers & Process Heaters - natural gas
- ICI Boilers & Process Heaters - oil
- Utility Boilers: Natural Gas
- Utility Boilers: Wood or Waste

Solution: First, Adjust Floor Setting

- Set limits in more reasonable way that avoids cherry picking data and accounts for variability
 1. Adjust for biases in data set including non-detect data
 2. Utilize more of the data – reclassify units as best performers with any good test run
 3. Consider approaches that look at current boilers ability to meet the set of HAP limits being contemplated – avoid “uber” boiler
 4. More subcategories based on design, size and fuel:
 - a. Wet vs dry biomass
 - b. Limited use and smaller boilers (<30 MM Btu)
 - c. Expand dutch oven, fuel cell and suspension burners subcategories

Solution: Second, §112(d)(4) Approach

- Balanced discussion of health emission standards (protective limits for fence line risks) for both HCl and manganese
 - weight of evidence to determine when a HAP is a “threshold pollutant”
– not precautionary principle
- Add total select metal (TSM) compliance option as alternative to PM surrogate standard
 - these metals are the actual regulated HAPs
 - essential to health standard for manganese
- Well grounded in CAA §112(d)(4) – add limit to Title V permit
 - \$2 to 4 billion capital cost reduction especially for biomass boilers
 - No SO₂ co-benefits with biomass scrubber controls

Other “Boiler” Solutions

- Use work practices for area source boilers (GACT) – not emission limits; allowed by law
- Classify more materials as fuels and not solid waste, honor principle of “discard”
 - Otherwise, materials will be landfilled including biomass residuals
- Same data and floor setting issues with CISWI MACT – limit to true incinerators, more subcategories

Conclusions

- Putting "ACT" back in MACT
 - **Achievable** – NO: "achieved in practice" so EPA doesn't need to understand how to meet; Unachievable
 - **Control Technology** – NO: based on observed emissions not tied to an actual control performance
 - **Maximum** – operative word, to the max ...

Summary

- Well-established legal basis for discretion
- More balanced proposal – protect public health in cost effective manner
- Should focus on MACT – not SO₂/PM co-benefits; defer to SIP program
- Unachievable or high cost for slight additional benefit
- Legal risks if rely on unrepresentative data

Additional slides

- Other groups concerned about Boiler MACT
- Costs to forest products industry and biomass boilers
- Subcategorization expansion
- Dioxin data is at limits of detection and variable
- Hg contributions from ICI boilers are small
- SO₂ co-benefits overvalued
 - forest product industry emissions outside of projected PM non-attainment areas
- Suggestions for issues for comment in the preamble

Concerned Trade Groups

- American Forest & Paper Association
- American Chemistry Council
- American Coke & Coal Chemicals Institute
- American Home Furnishings Alliance
- American Iron and Steel Institute
- American Municipal Power, Inc.
- American Petroleum Institute
- American Sugar Alliance
- American Wood Council
- Alliance of Automobile Manufacturers
- Brick Industries Association
- Composite Panel Association
- Corn Refiners Association
- Council of Industrial Boiler Owners
- Edison Electric Institute
- National Association of Manufacturers
- National Cotton Ginners Association
- National Oilseed Processors Association
- National Petrochemical & Refiners Association
- Ohio Municipal Electric Association
- Rubber Manufacturers Association
- Society of Chemical Manufacturers and Affiliates
- Treated Wood Council
- U.S. Chamber of Commerce

Expand Subcategorization

1. Further subcategories by boiler design for suspension burners, fuel cells and Dutch ovens
2. Biomass boiler design subcategory for all HAPs including PM, HCl and Hg (not just CO and dioxin)
3. Separate wet biomass from dry biomass
4. Differentiation by size - 30 to 50 MM Btu/hr
5. Limited use subcategory with work practice

Costs for Forest Products

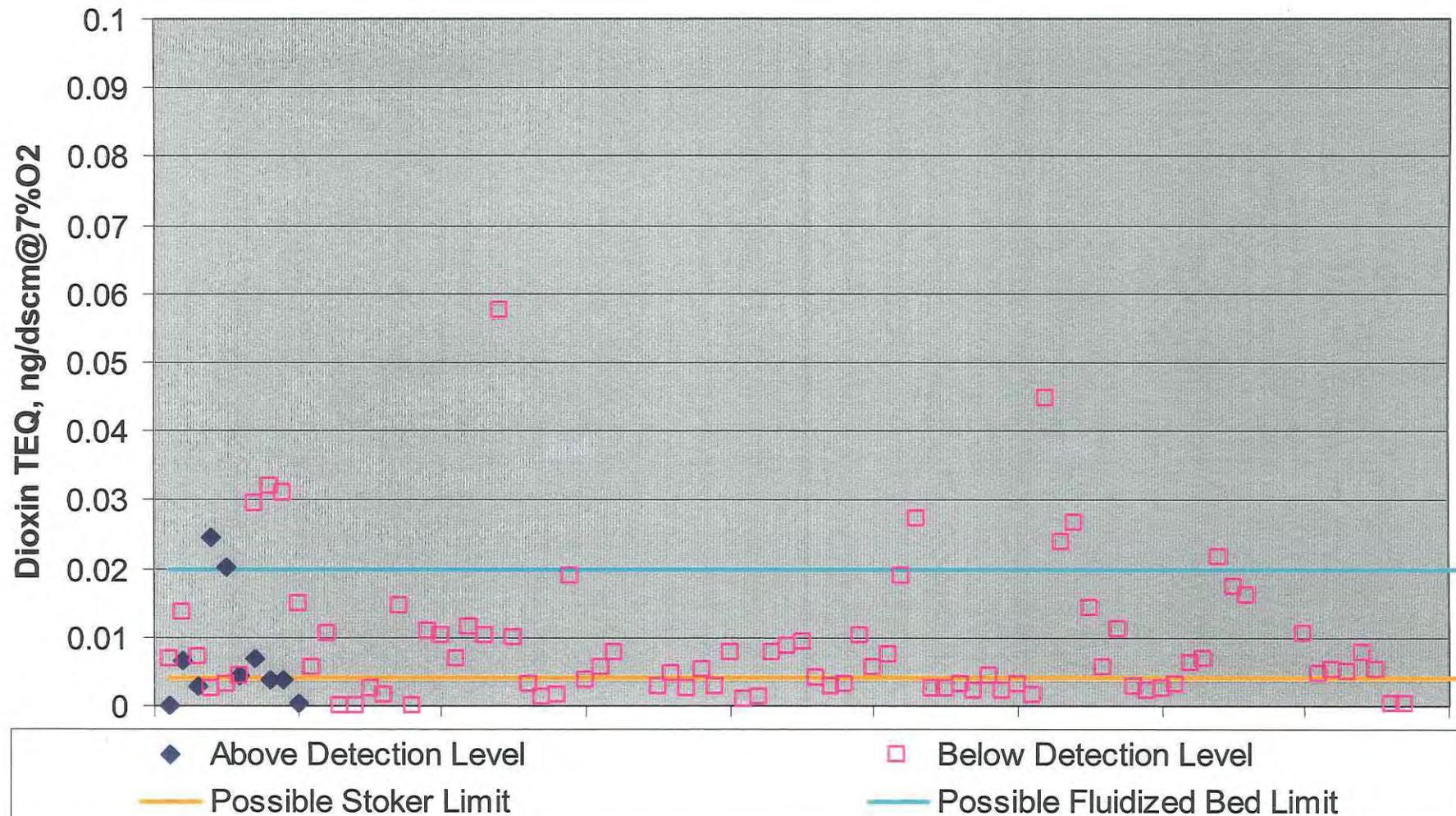
<u>HAPs/ Surrogates by Fuel type</u>	<u>PM/metals</u>	<u>Carbon Monoxide (CO)</u>	<u>Mercury</u>	<u>HCl (acid gases)</u>	<u>Dioxin</u>
Biomass	\$ 1.1 B	\$ 325 M	\$ 100 M (low?)	\$ 680 M	<i>Part of PM and mercury controls?</i>
Coal	\$ 490 M	<i>small ?</i>	\$ 100 M (fuel switch – low?)	\$ 560 M	<i>In PM/Hg costs?</i>
Oil	\$ 1.6 B	~\$ 350 M	<i>In PM \$\$ (wet scrub)</i>	<i>In PM \$\$ (wet scrub)</i>	<i>In PM costs?</i>
Gas	<i>88% of units w/ controls? fabric filters (~\$1-2M @)</i>	~\$ 350 M	<i>88% of units w/ controls? carb injection (~\$1M @)</i>	??	<i>In PM/Hg costs?</i>
Total cost: \$5.6 billion	\$ 3.2 B +	\$ 1.0 B	\$ 200 M +	\$ 1.2 B	<i>combustion changes?</i>

Biomass Boiler MACT Vulnerability

Pollutants/HAPs	PM/metals (in lb/MM BTU)	Carbon Monoxide (CO) (ppm)	Mercury (in lb/MM BTU)	HCl (in lb/MM BTU)	Dioxin (TEQ ng/dscm @ 7% O2)
Previous MACT limits	0.07/0.001	NA	9×10^{-6}	0.09	NA
Range of limits for existing boilers - estimated	0.013 – 0.039 (PM)	19395 -Dutch oven 320 - Fuel cell 2810 - Stoker/other 486 – fluidized bed 247–Suspension burn	0.26 to 2.4×10^{-6}	0.006 – 0.01	4.5E-03 Stoker 2.4E-02 FB 4.6E-04 Fuel Cell 8.4E-01 Dutch Oven 1.1E-02 Suspension
Likely controls for each HAP	High performing ESP	Combustion improvements and/or CO catalyst	Carbon injection in front of ESP or Fabric Filter	Scrubber	Combustion and temperature controls (would also get co-benefit from CI/FF)
Capital costs per boiler	\$5 M (new) \$3 M (add field)	\$ 0.5 - 2M	\$ 1 M (for CI addition only)	\$8 M	\$0.5 - 1 M for combustion improvements
Total MACT cost	\$630M capital	\$164M capital	\$5M capital	\$176M capital	(Captured in PM and Hg costs plus add to CO costs)

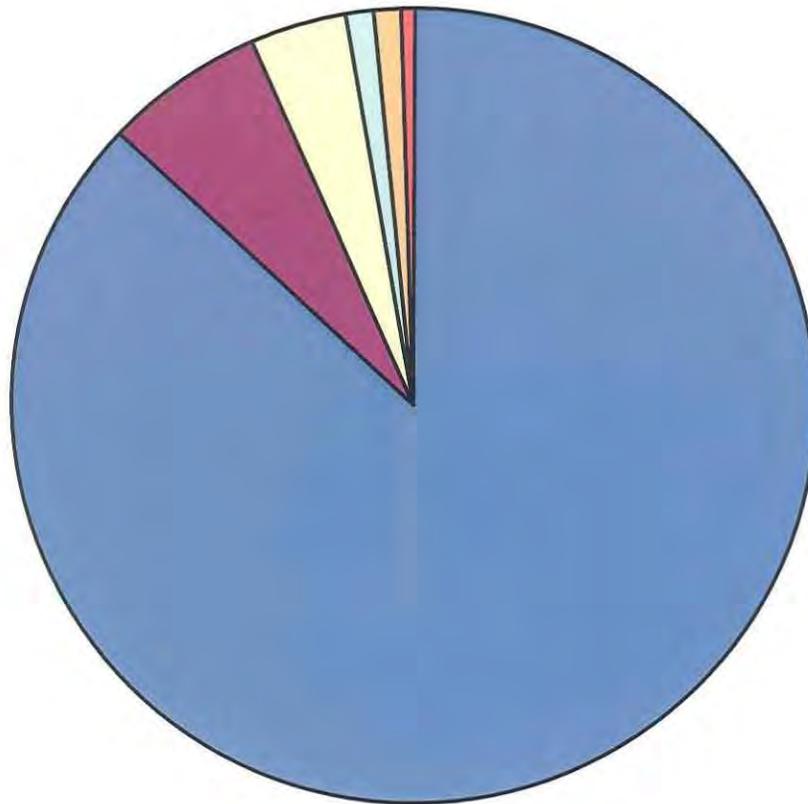
Biomass Boiler Dioxin Detection Limit

Biomass Boiler Dioxin Data



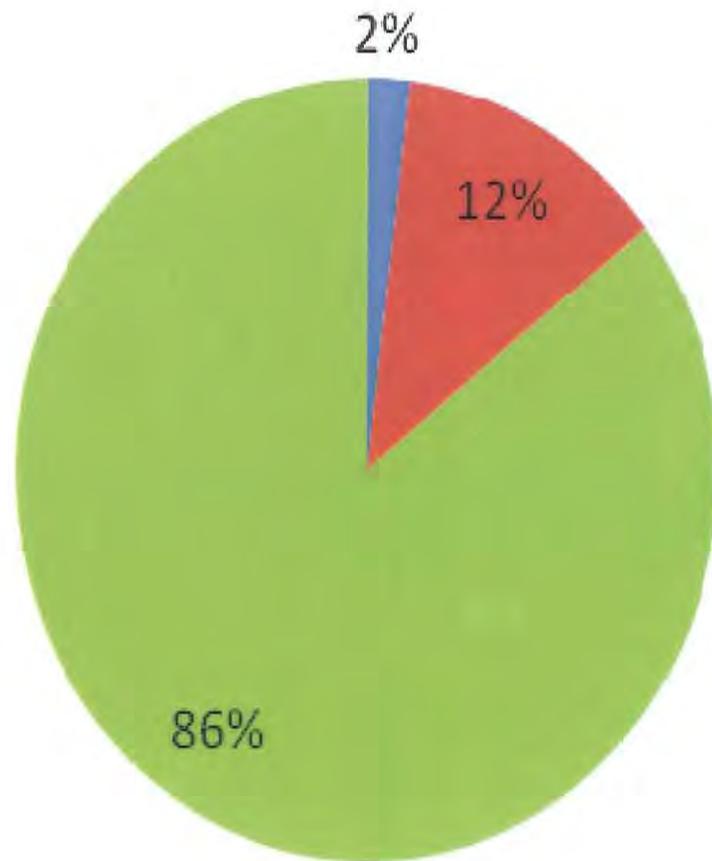
Hg Emissions – Small Contributors

2005 US Mercury Emissions By Boiler Type



- Utility Boilers: Coal
- ICI Boilers & Process Heaters - oil
- ICI Boilers & Process Heaters - coal
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- ICI Boilers & Process Heaters - wood or waste
- Utility Boilers: Oil
- Utility Boilers: Wood or Waste
- ICI Boilers & Process Heaters - natural gas

SO2 Emissions from Pulp and Paper Mills in Proximity to Projected PM 2.5 Non-Attainment Areas in 2020 (15/35)



- SO2 Emissions within PM Projected Non-Attainment Areas in 2020
- SO2 Emissions within 100 KM of PM Projected Non-Attainment Areas in 2020
- SO2 Emissions Outside of 100 KM of PM Non-Attainment Areas in 2020

Suggestions for Public Comment

- Seek input on whether the data base reflects the actual performance of the top 12% of sources within the population of boilers
 - any noticeable biases in the test data used for setting floors?
- Solicit comment on additional ways EPA should consider the variability of fuel quality, boiler designs, test performance, and use conditions that may influence emissions of best performers. For example:
 1. Include each test run (not average of test runs) in determining best performing boilers to better capture variability
 2. Seek comment on alternative floor methodology that puts all best performing units into a pool of top performers and then select limits so 12% of units can actually meet the set of four or five different HAP limits

Suggestions for Public Comment

- Ask for feedback on the appropriateness of setting floors from units whose emission are below the test method detection limit that could skew floor calculations
- Invite comment on the possibility that the limits being proposed may be technically unachievable by even well controlled sources
 - PM limits for gas-fired units
 - Invite comments on the ability to achieve the limits within 3 (4) years given the thousands of boilers affected and other major regulations that will create competition for pollution control consultants/engineers and vendors.
- Data base usable but need to change floor setting approach used with other recent MACTs