

EPA Proposed Air Toxics Rules for Boilers



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Overview



- Background Air Toxics Boiler Rule Development
- Overview Proposed Rules
 - National Emission Standard for Hazardous Air Pollutants (NESHAP) for Major Source Industrial, Commercial, Institutional Boilers and Process Heaters, 40 CFR Part 63, Subpart DDDDD
 - Pollution Prevention and Energy Assessments
 - NESHAP for Area Source Industrial, Commercial, and Institutional Boilers, 40 CFR Part 63 Subpart JJJJJJ
 - Pollution Prevention and Energy Assessments
- Resources for More Information

Proposed Regulations for Industrial, Commercial and Institutional Boilers Background



- Clean Air Act (CAA) created 2 different requirements for boilers (sec. 112) and commercial and industrial solid waste incinerator (CISWI) units (sec. 129)
- When EPA set standards for waste combustors, it excluded units that burn solid waste for energy recovery, treating them instead as boilers
- In June 2007, the U.S. Court of Appeals rejected EPA's standards, citing CAA language that "any facility burning any solid waste" is to be regulated as a waste combustor, not a boiler
- EPA is now on a court-ordered schedule to adopt final rules by January 16, 2011

Proposed Rules Published on June 4, 2010



- EPA Proposed 4 Separate, but Related Rulemakings
 - National Emission Standard for Hazardous Air Pollutants (NESHAP) for Major Source Industrial, Commercial, Institutional Boilers and Process Heaters
 - NESHAP for Area Source Industrial, Commercial, and Institutional Boilers
 - Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Commercial and Industrial Solid Waste Incinerators
 - Definition of Non-hazardous Solid Waste

How are these Rules Related?



- Units that burn SOLID WASTE would be subject to requirements under CAA section 129
- Units that burn materials that are NOT A SOLID WASTE would be subject to requirements under CAA section 112

Differences Between the Boilers and CISWI Rules



- Boilers (sec. 112)
 - Major sources (10 tons of any one toxic/25 tons of all toxics annually)
 - Standards must be set for all emitted toxic air pollutants
 - Limits must be based on “maximum achievable control technology” (MACT)
 - Area sources
 - Smaller sources (not major) may be regulated based on less stringent “generally achievable control technology” (GACT)
 - Exception for certain pollutants (e.g., mercury, polycyclic organic matter)
- CISWI units (sec. 129)
 - Standards must be set for 9 specific pollutants, not all of which are “air toxics”
 - Additional siting and operator training requirements
 - No provision authorizing GACT for smaller sources

Major Source Boiler MACT - Proposed Subcategories



- Eleven subcategories based on design type
 - Pulverized coal units
 - Coal-fired stokers
 - Coal-fired fluidized bed combustion units
 - Biomass-fired stokers
 - Biomass-fired fluidized bed combustion units
 - Biomass-fired Dutch ovens/suspension burners
 - Biomass-fired fuel cells
 - Liquid fuel-fired units
 - Gas 1 (natural gas/refinery gas)
 - Gas 2 (other gases)
 - Metal process furnaces (natural gas-fired)

Major Source Boiler MACT - Proposed Standards for Existing Units



- Emissions limits for units \geq 10 million Btu/hour
- Work practice standard (annual tune-up) for:
 - Units with heat input capacities less than 10 million Btu/hour
 - Units in Gas 1 and Metal Process Furnaces subcategories
- All existing major source facilities - conduct an energy assessment

Major Source Boiler MACT - Proposed Standards for Existing Units



- Proposed limits for nine of the eleven subcategories for:
 - Particulate Matter (PM) -as surrogate for non-mercury metals
 - Mercury (Hg)
 - Hydrogen Chloride (HCl) - as surrogate for acid gases
 - Carbon Monoxide (CO) - as surrogate for non-dioxin organic Hazardous Air Pollutant (HAP)
 - Dioxin/Furan
- Technology basis: Baghouse (metals/Hg); Carbon injection (Hg/dioxins); Scrubber (HCl); Good combustion practices (organic HAP)

Major Source Boiler MACT - Proposed Standards for New Units



- Emissions limits applicable to all units, regardless of size
- More stringent than limits for existing sources
- No work practice standards or beyond-the-floor standards proposed
- Proposed numeric emissions limits for nine of the eleven subcategories for:
 - PM (as surrogate for non-mercury metals)
 - Mercury
 - HCl (as surrogate for acid gases)
 - CO (as surrogate for non-dioxin organic HAP)
 - Dioxin/Furan
- Expected Technology
 - Baghouse (metals/Hg)
 - Carbon injection (Hg/dioxins)
 - Scrubber (HCl)
 - Good combustion practices (organic HAP)

Major Source Boiler MACT - Proposed Testing and Monitoring



- Testing
 - Initial compliance tests (PM, HCl, Mercury, THC, and Dioxins)
 - Annual performance tests
 - Allows emission averaging among existing units in same subcategory
- Monitoring
 - CO Continuous Emissions Monitors (CEMS) for units with heat input capacity of 100 million Btu/hour or greater
 - PM CEMS for units combusting coal, biomass, or residual oil and having a heat input capacity of 250 million Btu/hour or greater
 - Process parameters (opacity, pressure drop, sorbent injection rate, fuel, etc.)

Pollution Prevention and Energy Assessment - Major sources



- Facilities with existing boilers must conduct energy assessment by qualified personnel:
 - Visual inspection boiler system
 - Establish operating characteristics, energy system specifications, operating and maintenance procedures
 - A list of major energy conservation measures
 - Review available architectural and engineering plans, facility operation and maintenance procedures, and fuel usage
 - Energy savings potential of energy conservation measures identified

Pollution Prevention and Energy Assessment - Major sources



- Energy assessments cont'd:
 - Develop comprehensive report detailing ways to improve efficiency, cost of improvements, benefits, time frame for recouping those investments
 - Facility energy management program developed according to the ENERGY STAR guideline for energy management

Area Source Boiler Rule - Subcategories



- Three subcategories based on design type
 - Coal-fired units
 - Biomass-fired units
 - Liquid fuel-fired units
- Gas units not subject

Area Source Boiler Rule - Proposed Standards for Existing Units



- Emissions limits and energy assessment for boilers \geq 10 million Btu/hour
- Work practice standard/management practice (biennial tuneup) for boilers $<$ 10 million Btu/hour
- Proposed emission limits for units \geq 10 million Btu/hour :
 - For coal-fired boilers:
 - Mercury - based on MACT
 - CO (as surrogate for Polycyclic Organic Matter (POM) and other urban organic HAP) - based on MACT
 - Technology basis - baghouse (metals/Hg)/good combustion practices (organic HAP)
 - For biomass-fired boilers and oil-fired boilers:
 - CO (as surrogate for POM) - based on MACT

Area Source Boiler Rule - Proposed Standards for New Units



- Emissions limits applicable to all units, regardless of size
- No work practice standards proposed
- Technology basis for emission limits- baghouse (metals/Hg)/good combustion practices (organic HAP)
- Proposed emission limits:
 - For coal-fired boilers:
 - PM (as surrogate for urban metals)
 - Mercury (only for coal-fired boilers)
 - CO (as surrogate for POM and other urban organic HAP)
 - For biomass-fired boilers and oil-fired boilers:
 - PM (as surrogate for urban metals)
 - CO (as surrogate for POM and other urban organic HAP)

Area Source Boiler Rule - Proposed Testing and Monitoring



- Testing
 - Initial compliance tests (PM, mercury, and CO)
 - Annual performance tests
 - Biennial tune-up for boilers less than 10 million Btu/hour in size
- Monitoring
 - Process parameters (opacity, pressure drop, sorbent injection rate, fuel, etc.)
 - CO CEMS for units with heat input capacity of 100 million Btu/hour or greater

Pollution Prevention and Energy Assessment - Area sources



- Facilities with existing boilers must conduct energy assessment by qualified personnel:
 - Visual inspection boiler system
 - Establish operating characteristics, energy system specifications, operating and maintenance procedures
 - Identify major energy consuming systems
 - Review available architectural and engineering plans, facility operation and maintenance, fuel usage
 - Energy savings potential of energy conservation measures identify
 - Develop comprehensive report

Major Source and Area Source Rule Compliance Dates



- Existing Sources (commenced construction before June 4, 2010)
 - Must comply 3 years from publication of final rule
- New Boilers or Process Heaters (commenced construction on or after June 4, 2010)
 - Must comply upon publication of final rule, or upon startup, whichever is later

Schedule



- June 4, 2010 Proposed Rules
- Final Rules by January 16, 2011 (court ordered)



Appendix-Emission Limit Tables for Boiler Rules

Emission Limits for Existing Major Source Boilers and Process Heaters, lb/MMBtu

Subcategory	PM	HCl	Hg	CO (ppm @3% O ₂)	D/F (TEQ)(ng/dscm)
Coal Stoker	0.02	0.02	0.000003	50	0.003
Coal Fluidized Bed	0.02	0.02	0.000003	30	0.002
Pulverized Coal	0.02	0.02	0.000003	90	0.004
Biomass Stoker	0.02	0.006	0.0000009	560	0.004
Biomass Fluidized Bed	0.02	0.006	0.0000009	250	0.02
Biomass Suspension Burner/Dutch Oven	0.02	0.006	0.0000009	1010	0.03
Biomass Fuel Cells	0.02	0.006	0.0000009	270	0.02
Liquid	0.004	0.0009	0.000004	1	0.002
Gas (Other Process Gases)	0.05	0.000003	0.0000002	1	0.009

Emission Limits for New Major Source Boilers and Process Heaters, lb/MMBtu

Subcategory	PM	HCl	Hg	CO (ppm @3% O ₂)	D/F (TEQ)(ng/dscm)
Coal Stoker	0.001	0.00006	0.000002	7	0.003
Coal Fluidized Bed	0.001	0.00006	0.000002	30	0.00003
Pulverized Coal	0.001	0.00006	0.000002	90	0.002
Biomass Stoker	0.008	0.004	0.0000002	560	0.00005
Biomass Fluidized Bed	0.008	0.004	0.0000002	40	0.007
Biomass Suspension Burner/Dutch Oven	0.008	0.004	0.0000002	1010	0.03
Biomass Fuel Cells	0.008	0.004	0.0000002	270	0.0005
Liquid	0.002	0.0004	0.0000003	1	0.002
Gas (Other Process Gases)	0.003	0.000003	0.0000002	1	0.009

Emission Limits for Area Source Boilers, lb/MMBtu

Source	Subcategory	PM	Hg	CO, ppm
New Boiler	Coal	0.03	3.0E-06	310 (@ 7% O ₂)
	Biomass	0.03		100 (@ 7% O ₂)
	Oil	0.03		1 (@ 3% O ₂)
Existing Boiler (≥ 10 mmBtu/ hr)	Coal		3.0E-06	310 (@ 7% O ₂)
	Biomass			160 (@ 7% O ₂)
	Oil			2 (@ 3% O ₂)

Resources for More Information



- Boiler Regulation Information
 - <http://www.epa.gov/ttn/atw/boiler/boilerpg.html>
 - Proposed and final rules
 - Implementation tools
- ENERGY STAR Website
 - <http://www.energystar.gov/>
 - Guideline for Energy Management
- EPA Air Toxics Regulations
 - <http://www.epa.gov/ttn/atw/eparules.html>

For More Information



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Questions