Adjustments to the Air Toxics Standards for Major and Area Source Boilers

40 CFR Part 63, Subparts DDDDD and JJJJJJ
Summary of Final Changes, Key Highlights

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Presentation for Connecticut SIPRAC Meeting

February 14, 2013

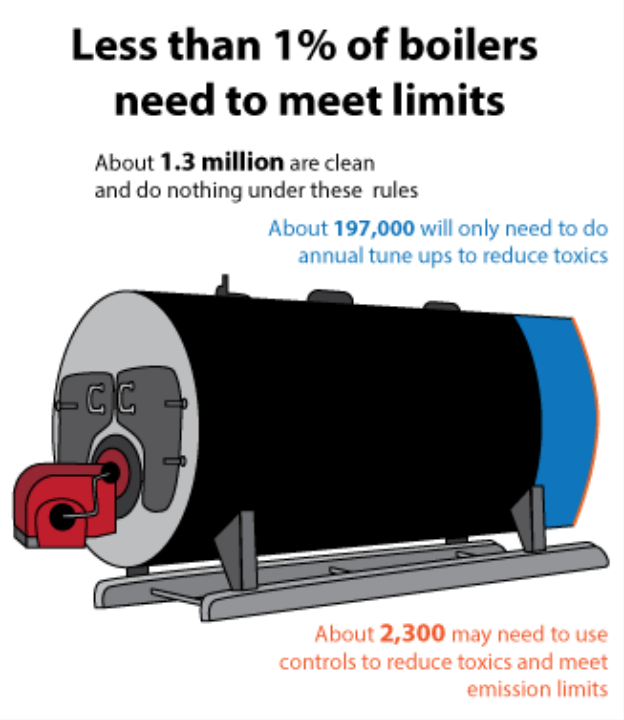
Overview

On December 20, 2012, EPA finalized a specific set of adjustments to March 2011 Clean Air Act standards, for boilers and certain solid waste incinerators.

These adjustments:

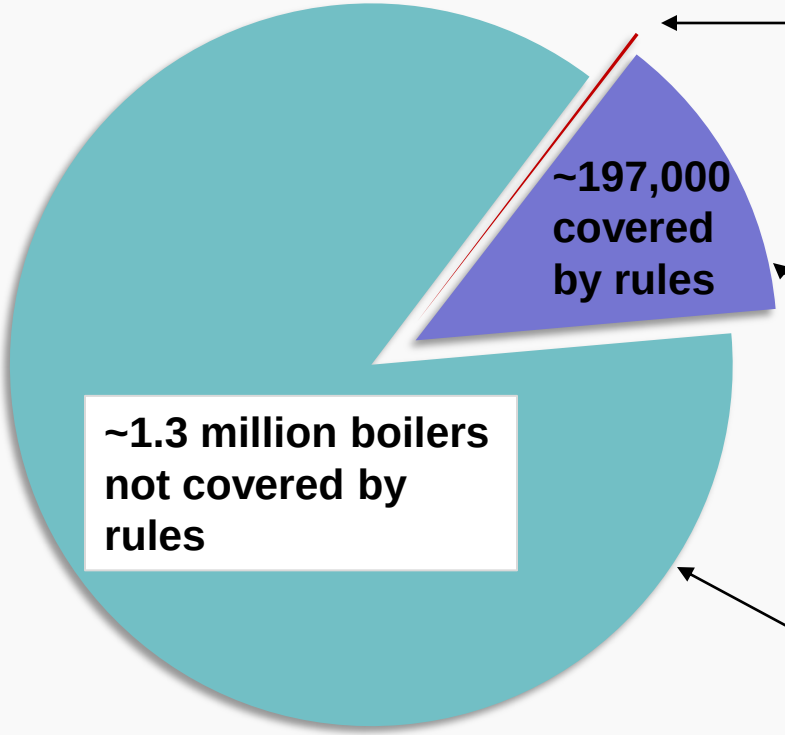
- maintain extensive public health protections achieved by the March 2011 standards by reducing toxic air pollution, including mercury and particle pollution.
- increase the rules' flexibility and address concerns raised by stakeholders.
- maintain the dramatic cuts in the cost of implementation that were achieved in the final standards issued in March 2011.
- provide clarity in identifying which non-hazardous secondary materials are, or are not, solid wastes when burned in combustion units.

Overall, these final standards address new data provided to the agency and additional information about real-world performance and conditions under which affected boilers and incinerators operate.



The Right Standards for the Right Boilers

Of 1.5 million boilers in the U.S.,
less than 1% will need to meet numerical emission limits



<1% (about 2,300) would need to meet numerical emission limits to minimize toxics. Most of these are larger boilers located at industrial facilities.

13% (about 197,000) would need to follow work practice standards, such as annual tune ups, to minimize toxics.

86% are clean and not covered by these rules. Many of these boilers are at places like hospitals, schools and churches.

Health Benefits

- Cuts emissions of pollutants such as mercury, particle pollution, sulfur dioxide, dioxin, lead, and nitrogen dioxide.
- Pollutants can cause a range of dangerous health effects - from developmental disabilities in children to cancer, heart attacks and premature death.
- Direct benefits to many communities where people live very close to these units.
- Together, the standards will avoid up to 8,100 premature deaths, 5,100 heart attacks, and 52,000 asthma attacks.
- EPA estimates that Americans would receive $13 to $29 in health benefits for every dollar spent to meet the standards.

Toxic Pollutants	Emission Reductions from All Rules Combined (tons per year)	
	March 2011 Final Rule	2012 Final Standards
Mercury	1.6	2.0 – 3.0
Non-mercury metals	3,000	2,100
Hydrogen Chloride	30,500	40,500
Particulate Matter ($PM_{2.5}$)	30,000	18,000
Sulfur Dioxide	450,000	580,000

Key Adjustments
Area Source Boilers

Final Rule Amendments Published in the Federal Register 2/1/2013

Adjusted emission limits

- Revised Hg and CO emission limit for new and existing large coal-fired boilers

Allowing the necessary time to implement the standards

- **Revised the deadline for initial notification** for existing area source boilers **to January 20, 2014**. Sources who already submitted an initial notification do not need to resubmit.
- **Delayed the initial tune-up compliance date** by two years for existing boilers **until March 21, 2014**
  - Deadline for submitting the notification of compliance status (NOCS) for tune-ups is now July 19, 2014
- Compliance date for boilers subject to emission limits and subject to the energy assessment requirement is still March 21, 2014

Key Adjustments
Area Source Boilers

Added to and refined the list of subcategories

- Added definitions for the following, not covered by the rule:
  - **Temporary boilers** used temporarily in place of another boiler while that unit is being replaced or repaired, generally over an operational period of less than 12 months, unless an extension is approved.
  - **Residential boilers** intended primarily for heat or power for a residential unit of up to four families, or a single unit residence that has been converted or subdivided into apartments or condos
  - **Electric boilers**
- Revised definition for “boiler” to clarify that process heaters are not covered by the rule
- Revised definition for “hot water heater” to clarify gas, oil, and biomass **hot water boilers (e.g., not generating steam) rated at less than 1.6 million Btu per hour are not covered by the rule**
- Added subcategories for seasonally-operated boilers and limited-use boilers

Key Adjustments
Area Source Boilers

Reduced tune-up frequency for certain boilers

- Requiring tune-ups every 5 years, instead of every 2 years, for:
  - **Seasonal boilers**, oil and biomass boilers which undergo a shut down for at least 7 consecutive months each 12-month period due to seasonal conditions, except for period testing (not to exceed 15 days in the 7 month shutdown)
  - **Limited-use boilers** with a federally enforceable annual average capacity factor of no more than 10 percent
  - **Oil-fired boilers with heat input capacity ≤ 5 MMBtu/hr**
  - **Boilers with oxygen trim systems**

- **Initial tune-ups are not required for new boilers**

Key Adjustments
Area Source Boilers

Revised energy assessment provisions

- More clearly defined the scope and clarified the energy assessment is limited to only those energy use systems located on-site associated with the affected boilers
- Specify that sources that operate under certain energy managements programs, e.g., ISO 50001 energy management system, that include the affected boilers satisfy the energy assessment requirement
- Added a cap (not to exceed 160 hours) for on-site technical hours for large fuel use facilities

Key Adjustments
Area Source Boilers

Added compliance alternative for PM for certain oil-fired boilers

- **New oil-fired units may combust low sulfur oil* as an alternative method of meeting the PM emission standard** (provided the boiler does not use a post-combustion control technology (except a wet scrubber) to reduce PM or sulfur dioxide emissions).

Providing continuous compliance alternative for CO emission limit

- Allowing CO CEMS as compliance alternative

*< .5 weight percent sulfur content requirements

Key Adjustments
Area Source Boilers

Reducing fuel sampling and performance testing requirements under certain circumstances

- **Coal boilers demonstrating initial compliance with the Hg emission limit**: if Hg constituents in the fuel or fuel mixture are measured to ≤ half of the Hg emission limit, no need to conduct further fuel analysis sampling
- **Boilers demonstrating initial compliance with the PM emission limit**: if the performance test results show that the PM emissions are ≤ half of the PM emission limit, no need to conduct further PM emissions testing

Revising provisions for dual-fuel fired boilers

- **Existing dual-fuel fired boilers** (i.e., commenced construction or reconstruction on or before June 4, 2010) **that fuel switch fuels from gas to coal, biomass or oil after June 4, 2010 remain existing sources**, as long as the boiler was designed to accommodate the alternate fuel
- New dual-fuel fired boilers that make such a fuel switch would continue to be considered new sources

Key Adjustments
Area Source Boilers

Electronic Reporting:

- The final rule added electronic reporting of the notification of compliance status (NOCS) reports using the Compliance and Emissions Data Reporting Interface (CEDRI) through EPA's Central Data Exchange (www.epa.gov/cdx)
- EPA is currently developing and testing a reporting template for the NOCS Report. Upon completion, expected in the fall of 2013, sources will be required to log into CEDRI and submit these reports
- Electronic reporting of performance test results still required, for test methods listed on the electronic reporting tool (ERT) website (www.epa.gov/ttn/chief/ert/index.html)

Key Adjustments
Major Source Boilers

Final Rule Amendments Published in the Federal Register 1/31/2013, effective April 1, 2013

Extended the compliance date for existing units to implement the standards

- **Compliance date for existing sources is January 31, 2016**

Adjusted emission limits based on new and corrected data

- New particulate matter (PM) emission limits for biomass fueled boilers
- New carbon monoxide limits to address variability
  - Added an alternate CO CEMS-based limits for most subcategories
- Allowing metals emission limits as an alternative to using PM limit as a surrogate for metallic air toxics
- Replaced dioxin limit with work practice standards – data shows dioxin emissions are below levels that can be accurately measured.

Key Adjustments
Major Source Boilers

Added to and refined the list of subcategories

- Final rule includes 18 subcategories of boilers based on fuel and design

Work practices – Tune-up requirement

- Requirement to optimize CO emissions to manufacturers specifications and also to be consistent with any NOx requirements
- Allow units with oxygen trim system, and gas and light liquid fuel boilers $\leq$ 5 MMBtu/hr, to conduct tune-up every 5 years
- Allow delay of inspections for certain situations

Work practices – Startup & Shutdown

- Revised startup and shutdown definitions based on starting & stopping supplying steam rather than proposal based on operating load
- Require clean fuel at startup and engaging control devices when coal, biomass or heavy oil is fired

Key Adjustments
Major Source Boilers

Revised energy assessment provisions

- More clearly defined the scope and clarified the energy assessment is limited to only those energy use systems located on-site associated with the affected boilers
- Specify that sources that operate under certain energy managements programs, e.g., ISO 50001 energy management system, that include the affected boilers satisfy the energy assessment requirement
- Added a cap (not to exceed 160 hours) for on-site technical hours for large fuel use facilities

Revised definition for “hot water heater” to clarify gas, oil, and biomass **hot water boilers (e.g., not generating steam) rated at less than 1.6 million Btu per hour are not covered by the rule**

Key Adjustments
Major Source Boilers

Compliance monitoring - increased flexibility

- Removed requirement for large biomass units to install PM CEMS
- Replaced requirement for large coal units to install PM CEMS with requirement to install a PM CPMS but have option to use PM CEMS
- Allow the use of SO2 CEMS as operating limit for demonstrating continuous compliance with the HCl limit

Continue to allow units burning clean gases to qualify for work practice standards instead of numeric emission limits

- Removed hydrogen sulfide (H_2S) fuel specification from the rule

Key Adjustments
Major Source Boilers

Electronic Reporting:

- The final rule added electronic reporting of ongoing compliance reports using the Compliance and Emissions Data Reporting Interface (CEDRI) through EPA's Central Data Exchange (www.epa.gov/cdx), once EPA has developed the specific reporting form.
- Electronic reporting of performance test results and CEMS relative accuracy test audit (RATA) data still required, for test methods listed on the electronic reporting tool (ERT) website (www.epa.gov/ttn/chief/ert/index.html)

For Additional Information

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For area source boilers:
http://www.epa.gov/boilercompliance
For major source and area source boilers:
http://www.epa.gov/ttn/atw/boiler/boilerpg.htm

Appendix

Emission Limits for Existing Major Source Boilers

Subcategory	#Units	Limits in 2011 Final Rule, lb/MMBtu unless noted					Limits for Reconsideration Final Rule, lb/MMBtu, unless noted				
		Hg, lb/TBtu	HCl	PM	CO, ppm	D/F, ng/dscm	Hg, lb/TBtu	HCl	PM	CO, ppm (CO CEMS-based)	D/F
Coal stoker	391	4.6	0.035	0.039	270	0.003	5.7	0.022	0.040	160 (340)	Work practice
Coal fluid. Bed	35	Solid fuel subcat.	Solid fuel subcat.	Solid fuel subcat.	82	0.002	Solid fuel subcat.	Solid fuel subcat.	0.040	130 (230)	Work practice
Coal PC	190				160	0.004			0.040	130 (320)	Work practice
Biomass wet stoker—revised subcategory	304				490	0.005			0.037	1,500 (720)	Work practice
Biomass fuel cell	14				690	4			0.020	1,100	Work practice
Biomass fluid. Bed	24				430	0.02			0.11	470 (310)	Work practice
Biomass dutch oven/pile burner—revised subcategory	24				470	0.2			0.28	770 (520)	Work practice
Biomass susp./grate	18				3,500	0.2			0.44	2,800 (900)	Work practice
Biomass suspension—revised subcategory	47				470	0.2			0.051	2,400 (2,000)	Work practice
Biomass dry stoker--new subcategory	74				490	0.005			0.32	460	Work practice
Heavy liquid-new subcategory	320	3.4	0.00033	0.0075	10	4	2.0	0.0011	0.062	130	Work practice
Light liquid-revised subcategory	581	3.4	0.00033	0.0075	10	4	2.0	0.0011	0.0079	130	Work practice
Gas 2	129	13	0.0017	0.043	9.0	0.08	7.9	0.0017	0.0067	130	Work practice
Non-cont. liquid		0.78	0.00033	0.0075	160	4	2.0	0.0011	0.27	130	Work practice

New and existing small (<10 MMBtu/hr) units, natural gas-fired units, metal process furnaces, units combusting other clean gases, and limited use units will be subject to work practice standards.

Emission Limits for New Major Source Boilers

Subcategory	Limits in 2011 Final Rule, lb/MMBtu unless noted					Limits for Reconsideration Final Rule, lb/MMBtu, unless noted				
	Hg, lb/TBtu	HCl	PM	CO, ppm	D/F, ng/dscm	Hg, lb/Tbtu	HCl	PM	CO, ppm (CO CEMS-Based)	D/F
Coal stoker	3.5	0.0022	0.0011	6	0.003	0.80	0.022	0.0011	130 (340)	Work practice
Coal fluid. bed	Solid fuel subcat.	Solid fuel subcat.	Solid fuel subcat.	18	0.002	Solid fuel subcat.	Solid fuel subcat.	0.0011	130 (230)	Work practice
Coal PC				12	0.003			0.0011	140 (150)	Work practice
Biomass wet stoker—revised subcategory				160	0.005			0.030	620 (390)	Work practice
Biomass fuel cell				470	0.003			0.020	910	Work practice
Biomass fluid. Bed				260	0.02			0.0098	230 (310)	Work practice
Biomass dutch oven/pile burner				470	0.2			0.0032	330 (520)	Work practice
Biomass susp./grate				1,500	0.2			0.026	1,100 (900)	Work practice
Biomass suspension								0.030	2,400 (2,000)	Work practice
Biomass dry stoker								0.030	460	Work practice
Heavy liquid	0.21	0.00033	0.0013	3	0.002	0.48	0.00044	0.013	130	Work practice
Light liquid	0.21	0.00033	0.0013	3	0.002	0.48	0.00044	0.0011	130	Work practice
New gas 2	7.9	0.0017	0.0067	3	0.08	7.9	0.0017	0.0067	130	Work practice
New non-cont. liquid	0.78	0.00033	0.0013	51	0.002	0.48	0.00044	0.023	130	Work practice

New and existing small (<10 MMBtu/hr) units, natural gas-fired units, metal process furnaces, units combusting other clean gases, and limited use units will be subject to work practice standards.

Emission Limits for Area Source Boilers

Subcategory	2011 Final Rule Emission Limits			Reconsideration Final Rule Emission Limits		
	Hg, lb/TBtu	CO, ppm	PM, lb/MMBtu	Hg, lb/TBtu	CO, ppm 3% oxygen	PM, lb/MMBtu
New Coal ≥ 10 MMBtu/h	4.8	400	0.03 (≥ 30 MMBtu/h) 0.42 (10 to 30 MMBtu/h)	22.0	420	No Change
New Biomass ≥ 10 MMBtu/h	-	-	0.03 (≥ 30 MMBtu/h) 0.07 (10 to 30 MMBtu/h)	-	-	No Change
New Oil ≥ 10 MMBtu/h	-	-	0.03	-	-	No Change
Existing Coal ≥ 10 MMBtu/h (600 units)	4.8	400	-	22.0	420	No Change
Existing Coal < 10 MMBtu/h (3,100 units)	-	-	-	-	-	-
Existing Biomass (168,000 units)	-	-	-	-	-	-
Existing Oil (11,000 units)	-	-	-	-	-	-

New and existing small (<10 MMBtu/h) coal-fired boilers, new and existing biomass-fired boilers, and new and existing oil-fired boilers are subject to a biennial tune-up requirement.
New and existing seasonal boilers, limited-use boilers, oil-fired boilers with heat input capacity ≤ 5 MMBtu/h, and boilers with an oxygen trim system are subject to a 5-year tune-up requirement.
Existing coal-fired, biomass-fired, or oil-fired boilers with heat input capacity ≥ 10 MMBtu/h (not including limited-use boilers) are subject to a one-time energy assessment requirement.

Emission Limits for Existing CISWI Units

Pollutant (units)[1]	CISWI Subcategories[2]									
	Incinerators[3]		Energy Recovery Units - Liquid/Gas	Energy Recovery Units - Liquid/Gas[3]	Energy Recovery Units - Solids	Energy Recovery Units - Solids	Waste-burning kilns		Small, Remote Incinerators[3]	
	2011 Final Rule	Reconsid. Final	2011 Final Rule	Reconsid. Final	2011 Final Rule	Reconsid. Final	2011 Final Rule	Reconsid. Final	2011 Final Rule	Reconsid. Final
HCl (ppmv)	29	29	14	14	0.45	**0.20 (biomass units) / 13 (coal units)**	25	3.0	220	**300**
CO (ppmv)	36	**17**	36	**35**	490 (biomass units)/59 (coal units)	**260 (biomass units) / 95 (coal units)**	110	**110 (long kilns) / 790 (preheater/precalciner)**	20	**64**
Pb (mg/dscm)	0.0036	**0.015**	0.096	0.096	0.0036	**0.014 (biomass units) / 0.14 (coal units)**	0.0026	**0.014**	**2.7**	**2.1**
Cd (mg/dscm)	0.0026	0.0026	0.023	0.023	0.00051	**0.0014 (biomass units) /0.0095 (coal units)**	0.00048	**0.0014**	0.61	**0.95**
Hg (mg/dscm)	0.0054	**0.0048**	0.0013	**0.0024**	0.00033	**0.0022 (biomass units) /0.016 coal units**	0.0079	0.011	0.0057	**0.0053**
PM, filterable (mg/dscm)	34	34	110	110	250	11 (biomass units) / **160** (coal units)	6.2	**4.6**	230	**270**
Dioxin, Furans, total (ng/dscm)	4.6	4.6	2.9	2.9	0.35	0.52 (biomass units) / **5.1** (coal units)	0.2	**1.3**	1,200	**4400**
Dioxin, Furans, TEQ (ng/dscm)	0.13	0.13	0.32	0.32	0.059	0.12 (biomass units) / 0.075 (coal units)	0.007	0.075	57	**180**
NO_x (ppmv)	53	53	76	76	290 (biomass units)/340 (coal units)	290 (biomass units) / 340 (coal units)	540	630	240	**190**
SO_2 (ppmv)	11	11	720	720	6.2 (biomass units)/650 (coal units)	7.3 (biomass units) / 650 (coal units)	38	**600**	420	**150**

1 **All emission limits are measured at 7% oxygen.**

2 **Number of units in each subcategory: 27 incinerators; 6 ERUs-liquid/gas; 22 ERUs-solids (18 biomass/4 coal); 23 waste-burning kilns; and, 28 small, remote incinerators.**

3 **Emission limits did not change from final to reconsideration proposal for this subcategory.**

Emission Limits for New CISWI Units

Pollutant (units)[1]	CISWI Subcategories									
	Incinerators[2]		Energy Recovery Units - Liquid/Gas	Energy Recovery Units - Liquid/Gas[2]	Energy Recovery Units - Solids	Energy Recovery Units - Solids	Waste-burning Kilns		Small, Remote Incinerators[2]	
	2011 Final Rule	Reconsid. Final	2011 Final Rule	Reconsid. Final	2011 Final Rule	Reconsid. Final	21011 Final Rule	Reconsid. FInal	21011 Final Rule	Reconsid. Final
HCl (ppmv)	0.091	0.091	14	14	0.45	**0.20 (biomass units) / 13 (coal units)**	3.0	3.0	200	200
CO (ppmv)	12	**17**	36	**35**	160 (biomass units)/46 (coal units)	**240** (biomass units) / **95** (coal units)	90	90 (long kilns) / **190** (preheater/ precalciner)	12	**13**
Pb (mg/dscm)	0.0019	**0.015**	0.096	0.096	0.0031	**0.014** (biomass units) / **0.14** (coal units)	0.0026	**0.014**	0.26	**2.0**
Cd (mg/dscm)	0.0023	0.0023	0.023	0.023	0.00051	**0.0014** (biomass units) / **0.0095** (coal units)	0.00048	**0.0014**	0.61	**0.67**
Hg (mg/dscm)	0.00016	0.00084	**0.00025**	**0.00056**	0.00033	**.0022 (**biomass units) / **0.016** (coal units)	0.0062	0.0037	0.0035	0.0035
PM, filterable (mg/dscm)	18	18	110	110	250	5.1 (biomass units) / **160** (coal units)	2.5	**2.2**	230	**270**
Dioxin, Furans, total (ng/dscm)	**0.052**	0.58	(no limit)	(no limit)	0.068	0.52 (biomass units) / **5.1** (coal units)	0.090	0.51	1,200	**1,800**
Dioxin, Furans, TEQ (ng/dscm)	0.13	0.13	**0.002**	0.093	0.011	0.076 (biomass units) / 0.075 (coal units)	0.0030	0.075	31	31
NO_x (ppmv)	23	23	76	76	290 (biomass units)/340 (coal units)	290 (biomass units) / 340 (coal units)	200	200	78	**170**
SO_2 (ppmv)	11	11	720	720	6.2 (biomass units)/650 (coal units)	7.3 (biomass units) / 650 (coal units)	38	**28**	1.2	1.2

1 **All emission limits are measured at 7% oxygen.**
2 **Emission limits did not change from final to reconsideration proposal for this subcategory.**