

An Overview of the EPA's Industrial Boiler MACT Rule

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Re-Proposed Rule At a Glance:

- Draft released Dec. 2, 2011
- Applies to facilities emitting more than 10 tons per year of any one HAP or 25 tons per year of a combination of HAPs
- Compliance must be demonstrated annually and on a continuous basis
- Sets emission limits for PM (or TSM), HCl, Hg, and CO
- Requires a one-time energy assessment of the affected facility
- Rule is expected to be finalized by mid-2012
- Compliance will be required three years after the rule is finalized — or mid-2015

On Dec. 2, 2011, the Environmental Protection Agency (EPA) issued the proposed amendments to the National Emission Standard for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial and Institutional Boilers and Process Heaters, commonly referred to as the Industrial Boiler MACT Rule. The rule will require emission limits and work practice standards to be met for industrial, commercial and institutional boilers across the nation.

Section 112 of the Clean Air Act requires that the EPA set national emission standards for different source categories of hazardous air pollutants (HAPs) that reflect Maximum Achievable Control Technology (MACT). The Industrial Boiler MACT Rule has a long history. The rule was first finalized by the EPA in February 2004. However, in 2007, just prior to the compliance deadline, the U.S. Court of Appeals vacated the rule and remanded it back to the EPA to be rewritten. The EPA took four years to rewrite the rule before finalizing it on March 21, 2011. However, in May 2011, the EPA took the unprecedented step of staying the effective date of the rule while it reconsidered several key aspects of the rule. The outcome of the reconsideration process is the proposed amendments, which essentially results in a re-proposed rule.

Summary of the Proposed Amendments

The following significant changes are proposed to the March 2011 Boiler MACT Rule:

- Revise emission limits based on new data received during the reconsideration process.
- Replace the numeric dioxin/furans emissions limits with work practice standards.
- Establish new subcategories:
 - Create new subcategories for light and heavy industrial liquids instead of a single liquid fuel subcategory.
 - Set new particulate matter (PM) emissions limits for each solid fuel subcategory instead of a single limit for all solid fuels.
- Establish total selective metals (TSM) emission limits as an alternative to the PM emission limits.

Summary of the Re-Proposed Rule

The Industrial Boiler MACT Rule applies to industrial, commercial and institutional boilers and process heaters that are located at facilities deemed a major source of HAP emissions. That includes any facility whose operations collectively emit more than 10 tons per year of any single HAP or 25 tons per year of any combination of HAPs. The rule requires each boiler, based on its subcategory, to meet emission limits and/or work practice standards and to demonstrate compliance on both an annual and a continuous basis.

Certain boiler subcategories do not have emission limits and instead must meet only a work practice standard, which consists of a boiler tune-up.

- New and existing boilers with a heat input capacity less than 5 million British thermal units/hour (MMBtu/hour) that burn gas or distillate oil must conduct a boiler tune-up every five years.
- Limited use boilers, new/existing boilers with a heat input capacity less than 10 MMBtu/hour that burn residual oil or any solid fuel and new/existing boilers with a heat input capacity between 5 and 10 MMBtu/hour that burn gas or distillate oil must conduct a tune-up every two years.
- Any new or existing boiler with a heat input capacity of 10 MMBtu/hour or greater must conduct a boiler tune-up annually.

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All other boilers, essentially all solid fuel-fired, liquid fuel-fired and process gas-fired boilers, with a heat input capacity greater than 10 MMBtu/hour must meet emission limits and operating limits for the following HAPs:

- Hydrogen chloride (HCl), as a surrogate for acid gas HAPs
- Mercury (Hg)
- PM, as a surrogate for non-mercury metallic HAPs, or TSM
- Carbon monoxide (CO), as a surrogate for non-dioxin organic HAP

Emission limits are based on boiler status (existing or new), fuel type and boiler type. The solid fuel-fired boiler subcategory is possibly the most impacted boiler group. The re-proposed emission limits for existing solid fuel-fired boilers are shown in Table 1. Emission limits for new boilers are even more stringent.

TABLE 1
RE-PROPOSED RULE EMISSION LIMITS FOR SOLID FUEL BOILERS^{a, b, c}
(EMISSION LIMITS FROM THE STAYED MARCH 2011 RULE ARE SHOWN IN PARENTHESES)

Fuel Subcategory	Boiler Subcategory	HCl lb/MMBtu	Hg lb/TBtu	PM or TSM		CO ^d 3-run avg / 10-day roll avg. (ppmvd @ 3% O ₂)
				lb/MMBtu	lb/MMBtu	
Coal / Solid Fossil Fuel	Stoker	0.022 (0.035)	3.1 (4.6)	0.028 (0.039)	8.3 x 10 ⁻⁵	220 / 34 (270)
	Fluidized Bed			0.088 (0.039)	1.7 x 10 ⁻⁵	56 / 59 (82)
	Pulverized Coal			0.044 (0.039)	5.9 x 10 ⁻⁵	41 / 28 (160)
Biomass / Bio-Based Solid	Stoker/Sloped Grate Wet Biomass	0.022 (0.035)	3.1 (4.6)	0.029 (0.039)	5.7 x 10 ⁻⁵	790 / 410 (490)
	Stoker/Sloped Grate Kiln-Dried Biomass			0.32 (0.039)	4.0 x 10 ⁻³	250 / NA (490)
	Fluidized Bed			0.11 (0.039)	1.2 x 10 ⁻³	370 / 180 (430)
	Suspension Burners			0.051 (0.039)	1.1 x 10 ⁻³	58 / 1,400 (470)
	Dutch Ovens / Pile Burners			0.036 (0.039)	2.4 x 10 ⁻⁴	810 / 440 (470)
	Fuel Cell			0.033 (0.039)	4.9 x 10 ⁻⁵	1,500 / NA (690)
	Hybrid Suspension Grate			0.44 (0.039)	4.9 x 10 ⁻⁴	3,900 / 730 (3,500)

^a The emissions limits applies to boilers with a heat input capacity of 10 MMBtu/hour or greater. Limited use boilers are not subject to the emission limits.

^b The rule also establishes alternative output based emission limits (not shown) for each of the emission limits in this table.

^c Emission limits must be met at all times except for start-up/shutdown periods during which emissions must be minimized.

^d The CO emission limit has an alternative 10-day rolling average (as demonstrated by a CO continuous emissions monitoring system) emission limit for each CO emission limit.

To provide some flexibility to meeting the emission limits, facilities are allowed to comply with the HCl, Hg, and PM limits by using emissions averaging, provided the average emissions are within 90 percent of the emission limit. HCl and Hg emissions may be averaged between boilers in a similar fuel subcategory (i.e. solid, liquid). However, PM emissions may only be averaged between boilers in a similar boiler subcategory.

In addition to meeting emission limits, boilers must also demonstrate continuous compliance through annual stack testing, continuous monitoring of key operating parameters, record keeping and reporting.

Finally, the rule establishes a “Beyond the Floor Requirement,” which requires a one-time energy assessment be performed on the facility by a qualified energy assessor to identify major energy conservation measures and estimated payback periods.

The EPA will take public comment on the re-proposed rule until early 2012 and expects to finalize the rule by late spring 2012. Boilers will have to be in compliance with the work practice standards and emission limits by three years after the date that the final rule is published in the *Federal Register*, which would be approximately late spring or early summer 2015.

Industry Impact

The EPA estimates more than 14,000 boilers and process heaters will be subject to the Industrial Boiler MACT Rule. A majority of these boilers, approximately 12,300, fire natural gas or refinery gas and, therefore, will only be subject to the work practice standards of the rule. That leaves approximately 1,700 boilers that will have to comply with the emission limits of the rule.

The rule is expected to have the most significant impact on facilities with boilers that burn coal or biomass. The EPA estimates there are approximately 600 coal-fired boilers and 400 biomass-fired boilers affected by the rule. Many of these solid fuel-fired boilers that were in compliance with the original 2004 rule will not be in compliance with the re-proposed rule's more stringent emission limits. The new emission limits may force owners of these solid fuel-fired boilers to significantly upgrade their existing pollution control equipment, consider switching to natural gas-fired boilers or shut down the boilers.

Total air pollution control upgrades for solid fuel-fired boilers could take many different forms, including the retrofit of sorbent injection systems, a fabric filter, or a scrubber, at minimum. The cost for these modifications will vary greatly, depending on boiler size, fuel type, the extent and condition of existing pollution control equipment and retrofit complexity. Capital costs could range from \$1 million or less for a sorbent injection system to \$5 million to \$10 million or more for a fabric filter or scrubber.

Facilities are faced with the predicament of having to proceed with compliance planning and implementation in the shadow of uncertainty around the rule. EPA will receive comments on the re-proposed rule, which may change the emission limits or certain aspects of the rule prior to final promulgation. Also, litigation of the final rule is inevitable, and Congress continues to draft legislation to provide the EPA additional time to develop the rule and lengthen the compliance period from three to five years. However, none of these actions will likely have a quick outcome.

Compliance Planning Is Key

Each compliance situation is unique. The only way to know what modifications might be necessary is to conduct a compliance study that establishes baseline emissions information and compares it against the Industrial Boiler MACT Rule emission limits. Because many facilities do not know the magnitude of their emissions, compliance studies will likely include stack testing to establish baseline emissions, which a facility can use to assess compliance and, if necessary, develop a corrective plan of action.

Facilities must begin planning now to meet the anticipated 2015 compliance date. In general, compliance planning (testing and preliminary studies) can take six to 12 months to complete, and air pollution control retrofits or new boiler installations can take from 12 to 30 months to complete.