THE HVAC FACILITY CONNECTION

Volume 3, Issue 2
Summer 2011

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EPA Issues Final Ruling on Maximum Achievable Control Technology for Boilers

The Clean Air Act (CAA) requires the Environmental Protection Agency (EPA) to develop rules to reduce specific air toxic emissions that have been identified as posing the greatest threat to public health in large urban areas as a result of emissions from certain categories of area sources. Industrial and institutional / commercial boilers and process heaters are included in two of the area source categories for regulation. These boilers are also on a list of CAA sources that are subject to Maximum Achievable Control Technology (MACT) regulation, specifically for mercury and polycyclic organic matter (POM).

On February 21, 2011, the Environmental Protection Agency (EPA) finalized a rule that will reduce emissions of toxic air pollutants from new and existing industrial, commercial, and institutional boilers and process heaters at major and area source facilities.

A Major source facility emits or has the potential to emit 10 or more tons per year (tpy) of any single air toxic or 25 tpy or more of any combination of air toxics. Major source boilers and process heaters are used at industrial facilities and may stand alone to provide heat for commercial facilities. The majority of major source boilers and process heaters are located at industrial facilities.

National Emission Standards for Hazardous Air Pollutants for Area Sources: Industrial, Commercial, and Institutional Boilers

For natural gas- and refinery gas-fired units the operator will be required to perform a tune-up for each unit every year. For units with a heat input capacity less that 10MMBtu/hr a tune up will be required once every two years. Units larger thant 10MMBtu/hr must montior oxygen as a measure of good combustion.

An Area source facility emits or has the potential to emit less than 10 tons per year of any single air toxic or less than 25 tpy of any combination of air toxics. The majority of area source boilers covered by this final rule are located at commercial and institutional facilities.

The rule covers boilers that burn fuels, including natural gas, fuel oil, coal, biomass (e.g., wood), refinery gas, or other gas to produce steam for energy or heat. Process heaters heat raw or intermediate materials during an industrial process. The boilers and process heaters that would be covered by these standards do not burn solid waste unless they are exempt under the Clean Air Act from standards for incinerators. Area boilers can also burn non-waste materials but do so usually only in small amounts.

The rule reduces emissions from toxic air pollutants including mercury, other metals, and organic air toxics, which include polycyclic organic matter (POM) and dioxins. Toxic air pollutants, also known as hazardous air pollutants or air toxics, are those pollutants known or suspected of causing cancer and other serious health effects.

Major source boilers have been divided into 15 different subcategories of boilers and

Impact on Health and Environment

This rule will reduce hazardous air pollutants or air toxics that are known or suspected to cause cancer and other serious health and environmental effects. The rule would cut emissions of pollutants that are of particular concern for children. Mercury and lead can adversely affect developing brains – including effects on IQ, learning, and memory. Mercury, lead, dioxin, and furans can build up in the environment, causing serious environmental effects and harm to the food chain as well.

EXPLORING THE BENEFITS AND COSTS

US Boiler Stats:		
	Major Boilers	Area Boilers
Current number of boilers in US	13,840	187,000
Estimated to be installed in next 3 years	47	2,400
The rule will reduce nationwide emissions by:		
	Major Boilers	Area Boilers
Mercury	1.4 tons per year	90 pounds per year
Non-Mercury Metals	2,700 tons per year	320 tons per year
Other various toxins and particulate /organic matter	477,000 tons per year	2,839 tons per year
Health Benefits		
In 2014 this rule will protect public health from exposure to fine particles and ozone by avoiding:		
Premature deaths	2,500-6,500	24-61
Chronic bronchitis	1,600 cases	17 cases
Nonfatal heart attacks	4,000	40
Hospital and ER visits	4,300	40
Acute bronchitis	3,700	38
Respiratory symptoms	78,000	800
Days when people miss work or school	310,000	3,200
Cases of aggravated asthma	41,000	420
Days when people must restrict their activities	1,900,000	19,000
Estimates that the value of the benefits associated with reduced exposure to particles and ozone	$22 billion to $54 billion	$210 million to $520 million
Estimate for installing and maintaining controls for this rule	$1.4 billion a year	$487 million a year

This information was found on the Enviornmental Protection Agency's website: www.epa.gov

process heaters based on the design of the various types of units. The final rule includes specific requirements for each subcategory. The EPA is regulating area source boilers based on boiler design. Boilers are designed differently depending on what kind of fuel they burn: coal, oil or biomass. Also, the final rule sets different requirements for large and small boilers. Large boilers have a heat input capacity equal to or greater than 10 million British thermal units per hour (Btu per hr). Small boilers have a heat input capacity less than 10 million Btu per hour.

The final rule covers boilers located at area source facilities that burn coal, oil, or biomass, or non-waste materials. Natural gas-fired area source boilers are not part of the two categories being regulated. The standards for area sources in the listed categories must be technology-based. Standards for area sources can be based on either generally available control technology (GACT), or maximum achievable control technology (MACT). To determine GACT, we look at methods, practices and techniques that are commercially available and appropriate for use by the sources in the category. We consider the economic impacts on sources in the category and the technical capabilities of the firms to operate and maintain the emissions control systems. MACT can be based on the emissions reductions achievable through application of measures, processes, methods, systems, or techniques, but must at least meet minimum control levels as defined in the CAA. Economic impacts cannot be considered when determining those minimum control levels. The final standards for existing and new coal-fired boilers at area sources are based on MACT for mercury and CO, and on GACT for PM. The final standards for existing and new biomass boilers and existing and new oil-fired boilers at area sources are based on GACT.

The Final Ruling
Major Source Boilers

For all new and existing natural gas- and refinery gas-fired units, the final rule establishes a work practice standard, instead of numeric emission limits. **The operator will be required to**

perform an annual tune-up for each unit. Units combusting other gases can qualify for work practice standards by demonstrating that they burn "clean fuel," with contaminant levels similar to natural gas.

For all new and existing units with a heat input capacity less than 10 million British thermal units per hour (MMBtu/hr), the final rule establishes a work practice standard instead of numeric emission limits. **The operator will be required to perform a tune-up for each unit once every 2 years.**

The final rule establishes numeric emission limits for all other existing and new boilers and process heaters located at major sources (including those that burn coal and biomass). The final rule establishes emission limits for mercury, dioxin, particulate matter (PM) (as a surrogate for non-mercury metals), hydrogen chloride (HCl) (as a surrogate for acid gases), and carbon monoxide (CO) (as a surrogate for non-dioxin organic air toxics).
The final rule requires monitoring to assure compliance with emission limits. The largest major source boilers must continuously monitor their particle emissions as a surrogate for metals such as lead and chromium. All units larger than 10 MMBtu/hr must monitor oxygen as a measure of good combustion. The final rule also requires monitoring to assure the boiler and pollution controls are operating within appropriate parameters.

Existing major source facilities are required to conduct a one-time energy assessment to identify cost-effective energy conservation measures.

Area Source Boilers

The final rule establishes standards to address emissions of mercury, particulate matter (PM) (as a surrogate for non-mercury metals), and carbon monoxide (CO) (as a surrogate for organic air toxics).

For new boilers, the final rule requires the following: Coal-fired boilers, with heat input equal or greater than 10 million Btu per hour, are required to meet emission limits for mercury, PM, and CO.

Biomass and oil-fired boilers, with heat input equal or greater than 10 million Btu per hour, must meet emission limits for PM. **Boilers with heat input less than 10 million Btu per hour must perform a boiler tune-up every two years.**

For existing boilers the final rule requires the following: Coal-fired boilers, with heat input equal or greater than 10 million Btu per hour, are required to meet emission limits for mercury and CO. Biomass boilers, oil-fired boilers, and small coal-fired boilers are not required to meet emission limits. **They are required to meet a work practice standard or a management practice by performing a boiler tune-up every 2 years.** By improving the combustion efficiency of the boiler, fuel usage can be reduced and losses from combustion imperfections can be minimized. Minimizing and optimizing fuel use will reduce emissions of mercury and all other air toxics.

All area source facilities with large boilers are required to conduct an energy assessment to identify cost-effective energy conservation measures. EPA has limited the impact of the final rulemaking on small entities by requiring that only existing coal-fired boilers meet emission limits for mercury and CO, establishing work practices or management practices, instead of emission limits, for existing small coal-fired boilers of less than 10 million Btu per hour of heat input and all existing biomass boilers and oil-fired boilers, and exempting most area source boilers from Clean Air Act title V permit requirements.

It is still to be determined if after further review, the EPA will make any changes to the Boiler MACT Rules and to what extent if any they will be modified from their current form. Owners and operators of affected facilities should track developments on the Boiler MACT Rules and be prepared to address compliance. Many existing boilers and process heaters will not meet the Boiler MACT emissions limitations without switching fuels or additional add-on controls. Brady can help assess existing equipment for Boiler MACT compliance and make recommendations for achieving compliance with the Rules.

For more information on the MACT ruling please visit the EPA website at:

http://www.epa.gov/ttn/atw/boiler/boilerpg.html

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