



The Boiler MACT Project: Regulation for the Real World

by Adam Peshek

In early 2011, President Obama signed an executive order requiring federal agencies to take a pragmatic approach when creating new, costly regulations. In it he advocates for an honest analysis of each regulation's pros and cons in an attempt to create rules that protect the public without using tactics that are overly burdensome:

Our regulatory system must protect public health, welfare, safety, and our environment while promoting economic growth, innovation, competitiveness, and job creation. It must be based on the best available science. It must promote predictability and reduce uncertainty. It must identify and use the best, most innovative, and least burdensome tools for achieving regulatory ends. It must take into account benefits and costs, both quantitative and qualitative. It must ensure that regulations are accessible, consistent, written in plain language, and easy to understand. It must measure, and seek to improve, the actual results of regulatory requirements.

—President Obama, Executive Order 13563

The Environmental Protection Agency's (EPA's) set of proposed regulations on industrial boilers—known as Boiler MACT—does not adhere to the spirit of this order. However, some simple changes to the proposed rules would reduce the harm that Boiler MACT does; it might even utilize the “least burdensome tools” that take “into account benefits and cost” and which, as EPA Administrator Lisa Jackson noted, “calculate standards

that fully reflect operational reality.”¹

“Boiler MACT” is the name given to national emission standards being promulgated by the Environmental Protection Agency in an effort to curb emissions of hazardous air pollutants (HAP) from industrial boilers and process heaters.²

The regulation imposes standards and emission limits for more than 200,000 boilers used in manufacturing, processing, mining, refining and other industries, as well as commercial boilers used in malls, apartments, restaurants and hotels. It does not apply to major commercial electricity generators, which are subject to different rules.

Boilers burn fuels, such as natural gas, coal, biomass and oil, to produce heat, which is then either used directly in industrial processes or used to produce steam, which drives turbines to produce electricity.³

Under Boiler MACT, facilities are divided into two categories: “major sources” and “area sources.” Major sources are facilities that emit 10 tons per year (tpy) or more of any single Hazardous Air Pollutant (HAP) or 25 tpy or more of any combination of HAPs; area sources are facilities that emit less than this. According to EPA, there are approximately 13,840 major source⁴ and 187,000 area source⁵ boilers in the U.S.

Under the Clean Air Act (CAA), a “source” is another name for a stack, vent or opening that releases

a pollutant. In this case, each boiler is considered a source. Existing sources and new sources are required to meet different standards:

- Standards for **existing sources** must be “at least as stringent” as the average emission limitation achieved by the best performing 12 percent of other existing sources.
- **New sources** must meet the emission limitation achieved by the source with the greatest emission controls.

The term “maximum achievable control technology” (MACT) refers to these standards.

Proposed Boiler MACT regulations have been controversial since released. When the rules were proposed in April 2010, EPA received nearly 5,000 comments, including comments of concern from hundreds of United States representatives, 56 senators, and over 20 current governors. EPA acknowledged the need to “calculate standards that fully reflected operational reality” and proposed replacement standards in June 2010.⁶ After another round of comments and dissent, EPA requested a 15-month extension in January 2011 in an attempt to “formulate the final standards based on careful consideration of all relevant data and upon full consideration of comments.”⁷ When environmentalists objected to this extension, the D.C. District Court ordered EPA to release the final regulation within one month, which it did on February 21, 2011.⁸

After releasing the finalized Boiler MACT rules, EPA announced it would once again reconsider them, opening up an additional public input period through July 15, 2011. After a compelling case was made to EPA that the rules needed much more consideration, the Agency indefinitely stayed the rules in May 2011. However, in January 2012 the D.C. Circuit Court vacated this stay, reinstating the original compliance deadline of March 2014.

On October 13, 2011, the U.S. House of Representatives passed H.R. 2250, also known as the EPA Regulatory Relief Act of 2011, by a vote of 275–142.⁹ The bill would give EPA 15 months to propose new, less stringent rules and give five years to comply with them, instead of the three years currently required in Boiler MACT. On March 8, 2012, 52 senators voted to insert similar language into a major transportation

funding bill. Despite a majority in support, the amendment failed due to Senate rules, which require 60 votes to amend an unrelated bill. The Senate’s version of the bill, S. 1392, has yet to be called for a stand-alone vote.

Policies that reduce harmful emissions of air pollutants can be beneficial. However, not all policies that reduce such harmful emissions are inherently desirable. Often, such policies will have costs as well as benefits. Estimates suggest that Boiler MACT will be enormously costly. In many cases, it simply will not be possible to achieve the emission goals using existing boilers; those boilers will have to be shut down. That is not only a waste of the resources embodied in the boilers but of the capital expended on building the boiler. If the plant reliant on the boiler must also be shut down because no alternate source of heat is available at a competitive price, further waste of capital and resources results. If industry estimates are accurate, the new rules, set to be finalized in April 2012, will have a devastating impact on America’s manufacturing and coal industries. Even if those industry estimates overstate the impact, the consequences are nonetheless highly significant and should be a cause for concern.

The EPA has maintained that it is using administrative procedures to address major problems with the current rules and does not need congressional assistance in creating achievable and effective new rules.¹⁰ Indeed, in December 2011 the Agency released its latest draft of proposed standards that included much-needed revisions to its original draft, noting it would release final standards in April 2012 after a 60-day period for the public to comment on the new proposal. Final standards should address three major provisions that have yet to be resolved:

- (1) The use of pollutant-by-pollutant standard setting instead of source-by-source.
- (2) The decision not to apply health-based emission limits for certain pollutants.
- (3) The reclassification of many materials which will place them under stricter incinerator standards.

If these issues are adequately addressed, the subsequent rules are more likely to protect the public and the environment, while imposing fewer burdens. (Whether the rules are a net benefit to society remains an open question and one that this brief does not seek to address.)

REGULATORY COSTS

The EPA undertook a cost/benefit analysis of the 2010 proposed rule, which found that the major source regulations would impose an upfront cost of \$9.5 billion and an annual cost of \$2.9 billion.¹¹ In its latest set of revised rules, EPA claims that the operational costs have been reduced to \$1.5 billion per year. By contrast, industry estimates claim that compliance costs could be as high as \$20 billion.¹² The forest products industry alone estimates that its capital costs for complying with the regulation would be over \$3 billion; meanwhile, the average annual pre-tax profit for the industry was \$3.6 billion in the past three years.¹³

Regardless of the exact costs, there is no dispute that this is a very expensive regulation. Since the more expensive rules for major boilers would primarily affect manufacturing and related industries, there is concern about the impact they will have on the sector. Both EPA and industry assessments agree that plant closures—and thus job loss—are likely with the finalized rules.

DUBIOUS BENEFITS AND PROCEDURAL IRREGULARITIES

The EPA claims that the health benefits outweigh the costs. If true, the regulations might be justified. But not necessarily. In particular, it is possible that another, incompatible, policy would result in higher *net* benefits. To see why, consider two policies, A and B, which are mutually exclusive (if A is implemented, B cannot also be implemented, and vice versa). Now let's suppose that A has a benefit of \$100 and a cost of \$50. The net benefit of A is \$50. Meanwhile, policy B has a benefit of \$110 and a cost of \$105. The net benefit of B is only \$5. If only policy A or policy B were being considered, each might seem desirable. However, when both policies are considered, it is clear that policy A is preferable to policy B because the net benefits of A are greater than the net benefits of B, even though the absolute benefits of B are greater than the absolute benefits of A.

When it comes to limiting emissions from industrial boilers, it is plausible that less onerous—and hence incompatible—regulations would have a higher benefit-to-cost ratio than the proposed Boiler MACT

regulations. The Boiler MACT regulations would only be justified if no such alternative existed.

In any case, the Agency's methods for calculating the risks and benefits are highly dubious. Boiler MACT addresses two types of pollutants: Hazardous Air Pollutants (HAPs) and Criteria Pollutants. HAPs comprise 187 chemicals identified in the 1990 Clean Air Act Amendments that are known or suspected to cause cancer, serious health effects, or adverse environmental effects. Criteria pollutants comprise six chemicals that are the most widespread pollutants and pose the biggest threat to human health. The EPA lists three HAPs (mercury, hydrogen chloride and dioxins/furans) and two criteria pollutants (particulate matter and carbon monoxide) as the main targets for emissions reductions from Boiler MACT.

While HAPs are the legitimate target of Boiler MACT, criteria pollutants are not. Rather, criteria pollutants are subject to National Ambient Air Quality Standards (NAAQS), under which each pollutant is assigned an acceptable level of ambient concentration through extensive and continuous air monitoring. As such, the evaluation of regulatory impacts from NAAQS is much more objective than the relatively subjective evaluations of HAP improvements from area to area.

Since EPA already regulates criteria pollutants through NAAQS, any further reduction of a criteria pollutant is considered a “co-benefit”. These co-benefits occur often, since controls aimed to reduce one pollutant can also reduce others. It turns out, though, that in EPA's cost-benefit analysis, all, yes all—100%—of the alleged health benefits associated with the rule come from reductions in particulate matter (PM),¹⁴ which is a criteria pollutant that is already subject to NAAQS; it is not a HAP. Moreover, the health benefits allegedly accrue even though the emissions of PM from boilers subject to the MACT rules are already below the level the EPA has deemed safe.¹⁵ The cost-benefit analysis provides no estimates for reductions in any of the targeted HAPs. In other words, the EPA's justification for Boiler MACT comes from the coincidental reduction of a pollutant below levels that EPA already deems safe and that the rule is not intended to address, with no analysis of any improved health effects that might arise from reducing the pollutants it is given statutory authority to target using these regulations.

To see how ridiculous this is, imagine that the federal government wanted to improve car safety and chose to do this by imposing stricter seat belt regulations. But in addition to mandating a new belt design, the federal government also mandated that car manufacturers introduce more sophisticated air bags. Now suppose that in tests the air bags do reduce injuries and fatalities but the new seat belts make no difference. What EPA is doing in this case would be analogous to the federal government using coincidental benefits from deployed air bags to justify stricter manufacturing rules related to seat belts.

EPA states in its analysis:

Due to data, resource, and methodology limitations, we were unable to estimate the benefits associated with the thousands tons of hazardous air pollutants that would be reduced as a result of this rule. Available emissions data show that several different HAPs are emitted from boilers, either contained within the fuel burned or formed during the combustion process.¹⁶

However, in the very next paragraph EPA states:

This rule is anticipated to reduce 370,000 tons of carbon monoxide, 37,000 tons of HCl, 1,000 tons of HF, 8.3 tons of mercury, and 3,400 tons of other metals, 1,200 grams of dioxins/furans each year from major and area sources.¹⁷

This claim is dubious for three reasons. First, it is illogical to state that the potential health benefits of a regulation could not be estimated and then to assert that the regulation will improve health quality by reducing emissions of various chemicals by specific amounts. To use the analogy once more, if the government wants to impose strict regulations on the manufacturing of seat belts, the government should be able to quantify why it thinks the regulations will have a net benefit to society. Otherwise, what is the point of the regulation? If the goal of the regulation is to reduce emissions of HAPs, the Agency should be able to articulate the quantifiable benefits from the estimated reduction.

Second, in promulgating similar regulations such as the Mercury and Air Toxics Standards (MATS)—the recently finalized rule targeting HAP emissions from power plants—EPA claims to have been able to quantify the benefits of reducing at least one HAP, mercury. In

its analysis of that rule, EPA quantified the benefits of reducing mercury at between \$500,000 and \$6 million per year—less than .01% of the total estimated benefits from the rule. In contrast, EPA estimates compliance costs for that rule to be \$11 billion.

It is puzzling that EPA should claim “data, resource, and methodology limitations” kept it from quantifying the benefits of reducing emissions of mercury for Boiler MACT when it seems to have been able to quantify those same benefits for a rather similar regulation. It is not inconceivable that having found negligible benefits from mercury reduction during its analysis of MATS, it decided that it would be safer simply not to attempt a quantification for Boiler MACT.

Regardless of the exact costs, there is no dispute that this is a very expensive regulation.

Third, EPA should not base its entire economic justification for a regulation on coincidental reductions of a pollutant that is regulated separately. Moreover, it does so by calculating the alleged benefits from small changes in PM emissions even though those emissions are already below the level that the Agency has determined to be safe. It does this by assuming in its model that reductions in PM at very low levels have the same benefit as reductions at levels that have been shown to be unsafe. But this neglects a basic concept of toxicology, namely that the total dose matters. At high doses, PM emissions certainly cause health problems. But it is not clear that the same is true at low doses—and the relationship is probably non-linear. Dr. David Kreutzer makes an astute comparison:

Suppose a study examined accidents in which four people each fell a distance of 50 feet. If two of the four died, the prediction of what is called a linear-dose response is that for every 200 feet that a population falls, two people will die. This would be averaged out among the population and the distance of falling. For instance, this linear-dose response would predict that for every 400 people who step off a six-inch curb, two will die from the impact. A cost-benefit calculation using this assumption would show that even a small city would save thousands of lives per day by cutting down all curbs. Though stepping out into street may be dangerous for other reasons, dropping down six

*inches is not the cause of any fatalities. Nor would eliminating curbs reduce any of the other dangers of stepping into the street.*¹⁸

To reiterate: In nearly every statement issued in favor of this regulation, EPA and its supporters continuously point to the benefits of reductions in mercury that can be expected if Boiler MACT goes forward. But as we have noted, the impact of reducing mercury and other HAPs is not even estimated in the cost benefit analysis conducted as part of the justification for this regulation; instead, all the benefits arise from coincidental reductions of already regulated pollutants.

THE NEED FOR REAL-WORLD STANDARDS

The Clean Air Act requires EPA to set MACT standards based on the “emission limitation achieved by the best performing 12 percent of existing sources.” As mentioned, the rules address emission levels for five pollutants: mercury, particulate matter, hydrogen chloride, carbon monoxide and dioxins/furans.

In this case, EPA decided to calculate standards on a pollutant-by-pollutant basis, instead of aggregate emissions from each facility. By considering pollutants separately, EPA was able to “cherry pick” restrictions based on the best-performing facilities for each pollutant, without taking into account the emissions of other pollutants from the same facility. In other words, a facility could be identified as a top 12 percent source based on low emissions of mercury, even if it was the highest emitting source of another pollutant. Paul Gilman, Senior Vice President at Covanta Energy Corporation and former Assistant Administrator for Research at EPA, testified before the House Energy and Commerce Committee, noting that: “This ‘pollutant-by-pollutant’ approach rather than ‘plant-by-plant’ is analogous to asking that the decathlon champion at the Olympics be able to win not only the overall decathlon, but all of the 10 gold individual events as well.”¹⁹

Even though no currently operating facility (identified by EPA) meets the standard for the combined pollutants, EPA has not chosen to reconsider this area of Boiler MACT. In fact, EPA has previously acknowledged that “there appears ... to be a substantial ambi-

guity in the statutory language about whether the MACT floor is to be based on the performance of an entire source or on the performance achieved in controlling particular hazardous air pollutants.”²⁰

Industry has repeatedly lamented that such an approach is unachievable. In addition to the enormous costs associated with compliance, emission controls used to cut one pollutant do not necessarily reduce emissions of other pollutants; sometimes they even cause higher emissions of other pollutants. At best, the approach requires the installation of multiple, very expensive pieces of emissions-control equipment. At worst, it may simply be unachievable because of huge engineering challenges and associated cost.

HEALTH-BASED VS. TECHNOLOGY-BASED RULEMAKING

Section 112(d) of the Clean Air Act (CAA) requires EPA to set national emission standards for sources of HAPs. For the first twenty years of the CAA, Congress directed EPA to regulate HAPs using a risk-based health standard. Under this standard, pollutants were regulated to prevent health effects with an ample margin of safety. When the CAA was amended in 1990, Congress moved to a zero-risk, technology-based standard—i.e. MACT. Instead of assessing potentially hazardous pollutants based on their impact on human health, EPA’s default standard-setting method is now based on the range of emission-curbing technologies in individual industries. For example, emission standards for steel mills are developed from the range of emissions-curbing technologies of other steel mills, pharmaceutical standards are based on industry-wide pharmaceutical emission controls, etc.

Though this technology-based (MACT) approach is the default way of setting standards, Congress recognized that for some pollutants it might be more stringent than necessary to protect public health and the environment. As a result, under Section 112(d)(4) of the CAA, Congress provided a risk-based option for pollutants which have an established health threshold.²¹

Data collected during the development of the Boiler MACT rule concluded that hydrogen chloride (HCl) and other acid gases accounted for 61 percent of the

total HAP emissions from boilers.²² In the 2004 Boiler MACT proposal, EPA included health-based emissions limits for HCl and other acid gases. In proposing the newly finalized rule, EPA requested comments on the possibility of readopting similar health-based limits.²³ Despite receiving a multitude of data reinforcing this policy, EPA decided not to adopt a health-based standard for HCl and acid gases, citing a lack of information on cumulative emission effects and environmental effects.²⁴ This is contrary to their findings in the 2004 rule, comments from the public, and other EPA regulations in which it determined that there are indeed health thresholds for these pollutants.

In September of 2010, 41 senators sent a letter to the EPA administrator asking her to use her discretion under 112(d)(4):

*To help reduce the burden of the rule in a manner that does not compromise public health and safety, ... we ask that you carefully consider the extensive record that supported the Agency's determination to include health-based emissions limitations for hydrogen chloride and manganese in the previous Boiler MACT rulemaking that was set aside by the reviewing court on wholly unrelated grounds.*²⁵

In its recently released reconsideration of Boiler MACT, EPA chose not to consider the health-based issue. In fact, EPA raised emission standards for HCl and mercury during the reconsideration without reconsidering a health-based standard.

The reasoning Congress gave for discretion under 112(d)(4) is clear and rational—to achieve the goals of the CAA without being overly stringent or costly. Given the prevalence and importance of HCl and other acid gas emissions in the rulemaking, the Agency should adopt such a standard or give detailed and compelling reasons for ignoring past decisions on setting health-based standards for these pollutants with established health thresholds.

SOLID WASTE RULE

In February 2011, EPA also released a final rule that defines which materials qualify as fuel and which materials are considered solid waste under the Resource Conservation and Recovery Act (RCRA).²⁶ These rules will have a similarly significant effect on

industry since they redefine which substances boilers can burn for fuel and which must be landfilled or incinerated under more stringent MACT standards for solid waste incinerators.²⁷ As a result of this rule, it appears that many sources long-considered boilers by EPA will be reclassified as solid waste incinerators.

If nonhazardous secondary materials (NSM) are not considered waste they may be burned under the Boiler MACT standards. However, if the NSM is classified as waste it must be burned under more stringent rules for incinerators (or landfilled). Prior to its December 2011 revisions, EPA effectively classified many industrial byproducts as solid waste, including certain petroleum and chemical products and residues, plastics, tires, biomass (wood) and other substances.

This would have had the perverse effect of forcing many manufacturers to switch from cheaper sources of energy derived from waste materials to more expensive sources, including fossil fuels. For example, it is unsure whether the waste rules would make biomass and other byproducts of the paper industry regulated under incinerator standards. Therefore, paper producers would find themselves having to pay more to burn more heavily regulated wood trimmings for fuel (which the industry burns for the majority of its energy needs). It would also force the paper industry to landfill millions of tons of biomass (that it would otherwise use as fuel)—certainly an unintended consequence that the Agency should not support.

In its December 2011 revisions, EPA pursued this issue by clarifying which materials would be defined as biomass and listing several examples, including forest-derived biomass. It also defined materials that would be considered waste, including tires and resonated wood, which would need to be incinerated under the more stringent incinerator rules. Additionally, the Agency included a proposed process through which industry can petition to list NSM as being suitable for fuel-burning under Boiler MACT, instead of regulated under incinerator standards.

While these revisions are a step in the right direction, they do not go nearly far enough. Rather than promulgating rules to address clearly defined and readily observable problems, the EPA has given only vague definition that requires careful interpretation and that will result in businesses petitioning the

Agency to make a case on a substance-by-substance basis. This is costly and environmentally perverse.

Rather than illogically treating many unlisted byproducts presumptively as “waste”, EPA should permit companies to continue to burn industrial byproducts as fuel unless the Agency can prove (through the proper regulatory channels) that individual byproducts should be relisted as waste.

CONCLUSION

Boiler MACT is an example of a regulation that could be amended in simple, appropriate ways to adhere to the spirit of President Obama’s Executive Order 13563. Instead of moving forward with the current proposed rule, EPA should address the issues raised in this brief, including by:

- Basing MACT floor policy decisions on the performance of actual existing boilers, not the performance of a hypothetical boiler that comprises restrictions for individual pollutants currently only achieved in isolation.
- Setting health-based standards per Section 112(d) (4) of the CAA for acid gases that are prevalent and have historically been regulated according to such standards.
- Only reclassifying fuels as “solid waste” (with all the associated additional burdens) if the EPA is able to prove that such a reclassification will result in substantial health benefits. Currently EPA is moving in the opposite direction, placing the burden of proof on industry to petition to remove substances that have historically been used as fuel.

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