

Memorandum

Subject: Economic Impact Analysis for the Proposed Reconsideration of the Mercury and Air Toxics Standards

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This document addresses the economic impacts of the proposed reconsideration of the Mercury and Air Toxics Standards. Based on our analysis, we anticipate that there will be minimal compliance costs, emission changes, or economic impacts associated with this proposed reconsideration.

Background

In December 2011, the U.S. Environmental Protection Agency (EPA) finalized the Mercury and Air Toxics Standards (MATS). Following promulgation of the final rule, the EPA received 20 petitions for reconsideration of numerous provisions of the National Emission Standards for Hazardous Air Pollutants (NESHAP) portion of the rule pursuant and 4 petitions for reconsideration of numerous provisions of the New Source Performance Standard (NSPS) portion of the rule. The EPA is granting reconsideration of two issues raised in the NESHAP portion of the rule (startup and shutdown provisions and new-source emission limits, including filterable PM monitoring) and one issue raised in the NSPS portion (notice and comment for the definition of natural gas). These are discussed in detail in the preamble for the proposed reconsideration.

This document focuses on the analysis of impacts for the revised emission limits proposed in this reconsideration. For the NSPS, the EPA is simply taking comment on the definition of natural gas that was previously finalized. As such, there would be no costs or emission changes associated with this issue. Additionally, the revisions to the startup and shutdown provisions are primarily clarifying and would also not result in changes to the costs or emission reductions previously estimated for the final MATS rule.

Costs and Emission Impacts

To determine whether there would be any change in compliance costs or emissions resulting from the revised standards proposed in this reconsideration, the EPA considered the level of

control required to meet each standard at a model 500 megawatt (MW) electricity generating unit (EGU) operating at 85 percent capacity. The analysis then considered the implications of the revised standard for the installation of control technology.

Mercury (Hg) from EGUs burning non-low rank virgin coal

For the analysis of the revised Hg standard, the EPA assumed the model plant burns coal with an average Hg content of 11.10 lb/trillion British thermal units (BTU). This is equivalent to the average Hg content reported for non-low rank virgin coals in the information collection request (ICR) for MATS.

Table 1. Hg Standards for New EGUs Burning Non-low Rank Virgin Coal

| | Standard | % control |
|--------------------------------|-----------------|------------------|
| Final New Source Hg Standard | 0.00020 lb/GWh | 99.8% |
| Revised New Source Hg Standard | 0.0030 lb/GWh | 97.0% |

While the level of control required decreases from 99.8 percent under the finalized Hg standard to 97.0 percent under the revised standard, this does not reflect a change in the control technology that would be required to achieve the standard. An EGU would need to install advanced Hg controls, such as activated carbon injection (ACI) with a fabric filter, selective catalytic reduction (SCR), or flue-gas desulfurization (FGD) in order to comply with either standard. This means there would be no significant incremental change in costs resulting from the revised standard.

While mathematically the revision of the standard would result in an increase in emissions at this hypothetical plant, in practice any increase would be minimal. The control devices needed to comply with the Hg standard cannot be fine-tuned to achieve a precise level of emission reductions, but instead are used to achieve reductions within a range. For this reason, the revision of the Hg standard and subsequent selection and installation of control equipment should not result in a significant increase in emissions beyond what was estimated for the final MATS rule.

While EPA did not conduct a separate analysis for new EGUs burning low rank virgin coal, the changes proposed in this reconsideration package for these units would not impact the anticipated control installations, nor do they significantly change the costs and benefits of the final MATS regulations.

Particulates (PM) from coal-fired EGUs

For the analysis of the revised filterable PM (fPM) standard, the EPA assumed the model plant burns coal with an ash content of 10 percent. This is at the high end of expected values for bituminous coals and, therefore, a conservative estimate.

Table 2. fPM Standards for New Coal-fired EGUs

| | Standard | % control |
|---------------------------------|-----------------|------------------|
| Final New Source fPM Standard | 0.0070 lb/MWh | 99.99% |
| Revised New Source fPM Standard | 0.090 lb/MWh | 99.88% |

Both the previously finalized fPM standard and the revised standard would result in the installation of high efficiency fabric filters, so there would be no significant change in cost relative to the previously finalized standard. As noted for the Hg standard, in practice, the revision of the fPM standard would not result in a significant increase in emissions over what was estimated for the final MATS rule.

While the EPA did not conduct a separate analysis for solid oil-derived fuel (pet coke) fired units, there are a limited number of these EGUs and the same technology choices would apply, resulting in no significant change in costs or emission reductions.

Sulfur Dioxide (SO₂) from coal-fired EGUs

For the analysis of the revised SO₂ standard, the EPA assumed the model plant uses coal with a range of sulfur content from 0.6 lbs/MMBtu to 2.5 lbs/MMBtu.

Table 3. SO₂ Standards for New Coal-fired EGUs

| | Standard | % control |
|---|-----------------|------------------|
| Final New Source SO ₂ Standard | 0.4 lb/MWh | 92.6 - 98.2% |
| Revised New Source SO ₂ Standard | 1.0 lb/MWh | 81.5 - 95.6% |

The EPA believes that many units will choose to meet the alternative SO₂ emission standard in lieu of meeting the HCl emission standard because they are already required to monitor for SO₂. Additionally, Prevention of Significant Deterioration (PSD) requirements for SO₂ under the New Source Review (NSR) program will drive the installation of high performing spray drier absorbers (SDAs) or wet-FGD scrubbers, regardless of the level of the MATS new source standard.¹

While the EPA did not conduct a separate analysis for solid oil-derived fuel (pet coke) fired units, there are a limited number of these EGUs and the same technology choices would apply, resulting in no significant change in costs or emission reductions.

¹ NSR permit requirements include, among other things, the application of BACT (best available control technology) under PSD. BACT control technology determinations and associated emission limit establishment involve case-by-case analyses and such analyses take into account site-specific factors such as energy, environmental and economic impacts. For that reason, it is impossible to strictly predict the outcome of such analyses. However, based on recent BACT determinations for SO₂ emissions from coal-fired EGUs, it is reasonable to expect that in most, if not all, cases, advanced flue gas desulfurization control technologies (such as wet-FGD scrubbers or high efficiency spray drier absorbers) would be required.

Hydrochloric Acid (HCl) from coal-fired EGUs

For the analysis of the revised HCl standard, the EPA assumed the model plant uses coal with a range of chlorine content, based on the averages reported in the MATS ICR.

Table 4. HCl Standards for New Coal-fired EGUs

| | Standard | % control |
|-----------------------------------|-----------------|------------------|
| Final New Source HCl Standard | 0.00040 lb/MWh | 99.6 – 99.9% |
| Revised New Source HCl Standard | 0.020 lb/MWh | 81.0 – 96.6% |
| Revised New Source HCl Standard * | 0.010 lb/MWh | 90.5 – 98.3% |

*Beyond-the-floor (BTF) emission standard

Some low-chlorine coals have high native capture due to the natural alkalinity of the fly ash and may only require limited incremental control, such as dry sorbent injection (DSI), to achieve either the final or revised new-source HCl limit. Units burning higher chlorine coals would need high performing FGD to achieve the previously finalized HCl limit, while the adjusted limit could possibly be met with lower performing controls. As explained for the SO₂ standard, the EPA believes that many units will choose to meet the alternative SO₂ emission standard in lieu of the HCl emission standard and that PSD requirements for SO₂ will drive the installation of high performing SDAs or wet-FGD scrubbers, regardless of the level of the MATS new source standard. For that reason, the EPA conducted a beyond-the-floor analysis to determine the level of control achieved by applying expected FGD controls. Units with SDAs in the MATS ICR database were examined to determine the level of control achieved for low-chlorine and high-chlorine coals. The analysis showed that the average level of control for units firing low-chlorine coals was approximately 90 percent while that of units firing high-chlorine coals was approximately 98 percent (coal-to-stack control).² The new source HCl emission standard was then adjusted downward so that the model plant burning a range of coals met that expected level of control. In this case, there is likely to be no significant change in cost or emissions resulting from the revised HCl limit.

Filterable PM Monitoring

The EPA is proposing to use the same PM continuous parameter monitoring system (CPMS) approach employed in the proposed Portland cement NESHAP. This CPMS approach, which requires emissions testing after each deviation of the operating limit, is a procedural change and will not impact the monitoring technology employed by affected sources. The EPA anticipates there will be negligible compliance costs or emission changes associated with this revision.

² Note that the differences in level of control are simply due to the fact that coals may have a range of chlorine contents. The emissions in either case are expected to be the same.

Economic, Employment, and Energy Impacts

Based on the analysis presented here, the EPA expects that the proposed revisions to the MATS standards for Hg from EGUs firing non-low rank virgin coal, and for PM, SO₂, and HCl from coal-fired EGUs, along with revisions to the filterable PM monitoring requirements, will not result in significant changes in costs or emission reductions relative to the previously finalized standards. As a result, the EPA does not anticipate any impacts on the price of electricity or energy supply. Additionally, for the reasons described above, the proposed reconsideration is not expected to raise any reliability concerns, since reserve margins will not be impacted and the proposed revisions do not impose new requirements on new or existing facilities.

The EPA typically presents the economic impacts to secondary markets (e.g., changes in industrial markets resulting from changes in electricity prices) and impacts to employment or labor markets associated with proposed rules based on the estimated compliance costs and other energy impacts, which serve as inputs to such analyses. However, because we do not estimate any significant change in cost in response to this proposed reconsideration, there would also be no macroeconomic or employment impacts expected as a result of this proposed rule.

Small Entity Impacts

The Regulatory Flexibility Act generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small not-for-profit enterprises, and small governmental jurisdictions.

According to the SBA size standards for NAICS code 221122 Utilities-Fossil Fuel Electric Power Generation, a firm is small if, including its affiliates, it is primarily engaged in the generation, transmission, and or distribution of electric energy for sale and its total electric output for the preceding fiscal year did not exceed 4 million MWh.

The EPA has determined that no small entities will experience a significant impact because the notice of reconsideration imposes no additional regulatory requirements on owners or operators of affected sources. We have therefore concluded that today's notice of reconsideration will not result in a significant economic impact on a substantial number of small entities.

Conclusions

Our analysis shows that new EGUs would choose to install the same control and monitoring technology in order to meet the revised emission limits as would have been necessary to meet the previously finalized standard. Under the relevant assumptions, we project that this rule will

result in no significant change in compliance costs or emission reductions relative to the previously finalized standards and, as a result, no economic, energy, or employment impacts. Additionally, there will be no impact on small entities.