No. 24A186

In the Supreme Court of the United States

MIDWEST OZONE GROUP,

Applicant,

v.

ENVIRONMENTAL PROTECTION AGENCY, ET AL.,

Respondents.

APPLICANT'S REPLY IN SUPPORT OF EMERGENCY APPLICATION FOR IMMEDIATE STAY OF FINAL AGENCY ACTION PENDING DISPOSITION OF PETITION FOR REVIEW

To the Honorable John G. Roberts, Jr.,
Chief Justice of the Supreme Court of the United States and Circuit Justice for the District of Columbia Circuit

Ancil C. Ramey (Counsel of Record)
David M. Flannery
Kathy G. Beckett
Keeleigh S. Huffman
STEPTOE & JOHNSON PLLC
Post Office Box 1588
Charleston, WV 25326
(304) 353-8000
Ancil.Ramey@Steptoe-Johnson.com

Edward L. Kropp
STEPTOE & JOHNSON PLLC
Post Office Box 36425
Indianapolis, IN 46236

Counsel for Midwest Ozone Group

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INTRODUCTION

An immediate stay is necessary to preserve the status quo pending litigation of the merits of the Rule which would otherwise impose immeasurable damage, economic harm and irreparable injury to many, including Applicant's membership. Contrary to the assertions of Respondents, there will be little to no harm to EPA, Intervenors, or the public from an immediate stay pending judicial review since current state and federal programs regulate these sources and related emissions.

EPA continues to reject comments from stakeholders and arguments made therein, especially those related to grid reliability issues due to an increase in economic pressure on coal and oil-fired electricity generating units ("EGUs"). However, any risk to the grid creates a ripple effect: high costs of compliance to EGUs, higher cost of power to consumers already struggling to afford it, a reduced generation fleet due to early retirements, decreased availability of energy to a population with an ever-growing demand for it, and an unreliable energy grid where outages and shutdowns are all too common.

It is essential to grant an immediate stay in order to protect all consumers of electricity, including Applicant and its membership, from the irreparable and immeasurable harm that will surely follow an unreliable energy grid. Without a stay, an unjustifiable risk is presented that will have immeasurable negative impacts across the entire country.

Applicant Midwest Ozone Group supports and incorporates herein the replies filed by Applicants who support an immediate stay of the entire Rule.

ARGUMENT

I. EPA Ignores CEMS Arguments Raised By Applicants To Confuse The Court And Justify A Rule That Is Unnecessary By The Standards Of The Clean Air Act.

Continuing its trend of ignoring comments, concerns, and arguments raised by Applicants, EPA disregards the administrative record and related arguments made over the course of the litigation thus far. EPA and the Respondent-Intervenors specifically point to issues related to continuous emission monitoring systems ("CEMS"). *See* EPA Resp. at 12; *see also*, Environmental Respondent-Intervenors Resp. at 39-40. Their respective Responses In Oppositions claim stay of the entire Rule is not justified as no Application has raised arguments associated with CEMS. *Id.* This is not so.

Applicant raised concerns and arguments relating to CEMS in its initial application in two different sections. *See* Midwest Ozone Group Appl. at 6-7, 11. Applicant specifically argues that EPA has "underestimated the cost to EGUs for the installation and operation" of CEMS, that "the Rule unjustifiability moves the goalposts for compliance," and the changes including the "compliance determination technique" has created breeding grounds for "compliance uncertainty." *Id.*

Not only were these points raised in Applicant's Application for Stay, but challenges to the Rule's requirements also relate to CEMS were raised in three distinct issues included in the Applicant's Non-Binding Statement of Issues filed before the U.S. Court of Appeals for the D.C. Circuit on July 29, 2024. App. at 0001a. Primary concern was expressed that the emission standard set forth in the Rule was

deemed by EPA to be achievable based on stack testing accomplished at three year intervals and has not been shown to be achievable by CEMS. *See* Midwest Ozone Group Non-Binding Statement of Issues, Doc. #2067071, (D.C. Cir. July 29, 2024) at ¶ 1; App. at 0001a. Other issues related to CEMS included the requirement that CEMS be installed on EGUS with binding schedules for requirement and that EPA grossly underestimated the costs of both the installation and operation of CEMS. *Id.* at ¶ 3-4; App. at 0002a.

Where the Oppositions flagrantly mischaracterize the arguments made by Applicant, it also attempts to mischaracterize the record. Contrary to what is argued by the Environmental Respondent-Intervenors, ninety-three percent have met the Rule's standard for non-mercury metals with *prior monitoring* – not CEMS. *See* Environmental Respondent-Intervenors Resp. at 12. This point supports the arguments made by Applicants that the Rule is unjustified. EPA continues to fail to show sufficient public health or environmental benefits to justify the Section 112(d)(6) revision on the basis of development in emissions control technologies.

II. EPA Ignores Findings By Numerous Stakeholders That The Rule Presents A Significant And Immediate Threat To Grid Reliability.

EPA finalized several EGU-focused rules the week of May 6, 2024, including the Rule challenged here. EPA asserts in the Rule that it collaborated with grid operators to ensure the proposed rule would not threaten grid reliability. *See* 89 Fed. Reg. 38526. However, grid operators have repeatedly warned EPA about the repercussions this Rule will have on the domestic electric grid, to no avail. *See* Midwest Ozone Group Appl. at App. 0453a (noting EPA's "pattern of ignoring the alarms raised by

grid experts concerning the threats to grid reliability resulting from rapid early retirement of dispatchable resources."), *see also, id*. at App. 0462a (warning of "concrete damages" that will occur as a result of this Rule including "business shutdowns, food spoilage, property damage, and lost labor productivity."); *id*. at App. 0312a.; ERCOT Comments, EPA-HQ-OAR-2018-0794-5976, App. 0006a-0007a ("due to the required cost of improvements, some portion of the affected units could simply retire instead of coming to compliance with new requirements" perhaps even before new generation comes online to replace them.). It is clear that grid operators are of the opinion that this Rule will force EGUs to close because they will be unable to finance the retrofitting of emissions controls, in turn, reducing the generation fleet where demands for energy continue to grow. *See* Midwest Ozone Group Appl. at App. 0482a.

EPA is not just changing the numerical standard. It changes both the compliance determination technique and the averaging period. EPA punishes the sources that have met the low emitting EGU limit of the MATS rule (0.015 lbs/MMBtu) by eliminating the ability to demonstrate compliance through testing once every three years after a lengthy demonstration of the ability to meet the limit. From a technical standpoint, changing the numerical limit, averaging period and the compliance demonstration techniques results in a massive increase in stringency of the standard. The result is to add costs that will force merchant coal-fired generators out of business and put rate based coal-fired generators at risk.

Noteworthy, EPA has been historically encouraged by the courts to solicit input from FERC and others that could have adequately advised on issues related to grid reliability. *See Motor Vehicle Mfrs. Ass'n v. State Farm Mutual Automobile Ins. Co.*, 463 U.S. 29, 43 (1983); *see also, Del. Dep't of Natural Res. & Envtl. Control v. Envtl. Prot. Agency Del. Dep't of Nat. Res.*, 785 F.3d 1, 18 ("On remand, we encourage EPA to solicit input from FERC, as necessary"); *Texas v. EPA*, 829 F.3d 405, 432 (5th Cir. 2016) (finding that "EPA has no expertise on grid reliability."). A serious likelihood of multiple fossil fuel EGU retirements directly resulting from this Rule, properly casts doubt on EPA's interpretation of its own statutory authority.

III. EPA Ignores Valid Critiques Of Its IPM Modeling, Rebutting The Agency's Assertions That No Coal-Fired Generation Will Retire As A Result Of This Rule.

EPA asserts that it utilizes "a state of the art, peer review model" that projects that the Rule will not lead to retirement of any coal-fired capacity. Midwest Ozone Group Appl. at App. 0102a. EPA's conclusion based on that model is there would be no effect on grid reliability. 89 Fed. Reg. at 38526. Applicant and other stakeholders have provided EPA with data and comments indicating that this simply is not true. EPA has been informed of the negative impacts that this Rule will have on all stakeholders, the economy, and the domestic energy grid.

EPA concedes numerous times that IPM only provides one estimate of future generating capacity. For example, EPA states that it "…assumed Hg inlet levels...consistent with IPM assumptions… and then adjusted accordingly…." 89 Fed Reg 38,542. EPA adds that "IPM's least-cost dispatch solution is designed to ensure

generation resource adequacy, either by using existing resources *or through the construction of new resources*." RIA at ES-6 (emphasis supplied). It then acknowledges stacking estimates upon estimates, noting that "[t]he estimates on non-mercury HAP metals reductions were obtained by multiplying the ratio of non-mercury HAP metals to fPM by estimates of PM10 reductions under the rule, as we do not have estimates of fPM reductions using IPM, only PM10." RIA ES-8, FN 7. EPA finally concedes that "[w]e note that IPM provides EPA's best estimate of the costs of the rules to the electricity sector. These compliance cost estimates are used as a proxy for the social cost of the rule." RIA page ES-10. Put simply, IPM provides an estimate. EPA notes that it has used IPM for decades and it is revised periodically. EPA does not reveal that its past IPM projections have been grossly inaccurate. The last time the MATS Rule was litigated, EPA underestimated the reduction of coal-fired generation by 55,000 megawatts. *See* 77 Fed. Reg. 9407 (stating that the "expected retirements of coal-fueled units" would be 4.7 gigawatts and would be "fewer than was estimated at proposal and much fewer than some have predicted"); *see also*, National Mining Association Comments, EPA-HQ-OAR-2009-0234-20531 at 2, App. 0125a. ("Between 2012 when the rule went into effect and 2016 when the rule's compliance period ends, almost 60 GW of coal capacity will have retired, including units that have already retired or, for 2016, have announced their retirement."). EPA was wrong then and is now. In the Rule, EPA notes that the compliance costs for the Rule are higher than the estimates in the RIA for the proposal of this action, largely due to changes in fPM control assumptions, and adds that "[i]t is also important to note that EPA also

updated the IPM baseline power sector modeling." RIA at ES-11. In other words, EPA has manipulated with IPM results throughout this rulemaking to manage its results, hardly a basis for imposing the cost of compliance on the regulated community.

IV. The Balance of the Equities and the Public Interest Favor an Immediate Stay.

EPA misuses its authority under the Clean Air Act to advance its agenda this Rule. The Rule was promulgated based on an evaluation of the residual risk and technology review that reflects developments in control technologies. Yet, EPA has not demonstrated that the Rule is *necessary* per the requirements of Section 112(d)(6) of the Clean Air Act. What has been demonstrated is the economic harm to the regulated community and the immediate, irreparable harm to all users of electricity due to negative impacts on grid reliability resulting from this Rule. Access to reliable, affordable electricity is a national interest that the public and the regulated community share, and it certainly weighs in favor of a stay. *Texas v. EPA*, 829 F.3d 405, 435 (5th Cir. 2016); *Sierra Club v. Ga. Power Co.*, 180 F.3d 1309, 1311 (11th Cir. 1999); *West Virginia v. EPA*, 90 F.4th 323, 332 (4th Cir. 2024). EPA continues to ignore real world data and input from stakeholders in favor of an ill-conceived and illegal effort direct energy choices through rigorous and unjustified regulation. As such, the balance of the equities and the public interest favor an immediate stay of this rule, pending review of the merits.

CONCLUSION

For the foregoing reasons, Applicant respectfully requests an immediate stay of the Rule to prevent irreparable harm to its membership and the domestic electricity grid.

/s/ Ancil G. Ramey
Ancil G. Ramey

Ancil G. Ramey
Counsel of Record
David M. Flannery
Kathy G. Beckett
Keeleigh S. Huffman
STEPTOE & JOHNSON PLLC
707 Virginia Street, East
Post Office Box 1588
Charleston, WV 25326
(304) 353-8000
Ancil.Ramey@steptoe-johnson.com

Edward L. Kropp
STEPTOE & JOHNSON PLLC
PO Box 36425
Indianapolis, Indiana 46236
Counsel for Midwest Ozone Group

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ORAL ARGUMENT NOT YET SCHEDULED

IN THE UNITED STATES COURT OF APPEALS
FOR THE DISTRICT OF COLUMBIA CIRCUIT

MIDWEST OZONE GROUP, Petitioner, v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, and MICHAEL S. REGAN, Administrator, United States Environmental Protection Agency, Respondents.	)	Case No. 24-1223 (consolidated with 24-1119)

NONBINDING STATEMENT OF ISSUES OF
PETITIONER MIDWEST OZONE GROUP

Pursuant to this Court's Order dated June 27, 2024, Petitioner Midwest Ozone Group submits this preliminary and nonbinding statement of issues in this proceeding to review the final action of the United States Environmental Protection Agency ("EPA") published in the Federal Register at 89 Fed. Reg. 39,508 (May 7, 2024) entitled "*National Emission Standards for Hazardous Air Pollutants: Coal - and Oil-Fired Electric Utility Steam Generating Units Review of the Residual Risk and Technology Review*" (Docket ID No. EPA-HQ-OAR-2018-0794) ("Rule"):

1. Whether the proposed standard of 0.010 lb/MMBtu, measured using continuous emissions monitoring, is unlawful because the vast majority of emissions data used to propose that standard were based upon EPA required stack testing, much of it accomplished at a 3 year interval as part of the low emitting electric generating unit (LEE) provisions of 40 CFR Part 63, Subpart UUUUU, appropriately balances CAA Section 112(d)(2)'s direction to achieve the maximum degree of emissions reductions while "taking into consideration the cost of achieving such emission reduction, and any non-air quality health and environmental impacts and energy requirements."

2. Whether the Rule is unlawful and therefore unnecessary because Section 112(d)(6) of the Clean Air Act only directs EPA to review and revise standards *as necessary* no less often than every 8 years.

3. Whether the Rule is unlawful because it requires installation of CEMs on EGUs with binding schedules for retirement.

4. Whether the Rule is unlawful because EPA has grossly underestimated the cost of installing and operating Continuous Emissions Monitoring Systems for particulate matter, grossly overestimated the cost of stack testing, and has failed to provide the true additional costs of the Rule.

5. Whether the Rule is unlawful because it revises not only the numerical value,

but both the compliance determination technique and the averaging period as well, punishing the sources that have met the low emitting EGU limit of the MATS Rule (0.015 lb/MMBtu) by eliminating the reward of testing once every three years after a lengthy demonstration of the ability to meet that limit.

6. Whether the Rule is unlawful because EPA assumed an unrealistic implementation of the Inflation Reduction Act and the implementation of renewable assets.

7. Whether the Rule is unlawful because it will result in significant risk to grid reliability despite the evidence presented by EPA that the Rule will not result in any meaningful environmental benefits achieved by reduction in mercury and non-mercury metals.

8. Whether the Rule is unlawful because the cost of compliance grossly exceeds the monetized value of benefits.

9. Whether the Rule is unlawful because EPA included in its benefit calculation the value of benefits in areas that are attaining the PM and ozone NAAQS which, by definition, are levels adequate to protect human health with an adequate margin of safety.

10. Whether the Rule is outside the scope of EPA's authority as defined by the Clean Air Act and set forth in *West Virginia v. EPA*, 597 U.S. 697 (2022).

Petitioner Midwest Ozone Group reserves the right to raise any additional

issues in briefs to be filed in these consolidated cases.

Respectfully submitted,

David M. Flannery

David M. Flannery
Kathy G. Beckett
Keeleigh S. Huffman
Steptoe & Johnson PLLC
707 Virginia Street, East
Post Office Box 1588
Charleston, WV 25326
(304) 353-8000
Dave.Flannery@steptoe-johnson.com
Kathy.beckett@steptoe-johnson.com
Keeleigh.Huffman@steptoe-johnson.com

Edward L. Kropp
Steptoe & Johnson PLLC
PO Box 36425
Indianapolis, Indiana 46236
317-946-9882
Skipp.kropp@steptoe-johnson.com

Counsel for Petitioner Midwest Ozone Group

Dated: July 29, 2024

CERTIFICATE OF SERVICE

Pursuant to Fed. R. App. P. 15(c), Circuit Rule 15(a), Fed. R. App. P. 25, and 40 CFR 23.12(a), on this date, I hereby certify that a copy of the foregoing Nonbinding Statement of Issues of Petitioner Midwest Ozone Group was filed with the Clerk of the Court using the CM/ECF System, which will send notice of such filing to all registered CM/ECF users.

David M. Flannery

Dated: July 29, 2024

ercot
Your Power. Our Promise.

TAYLOR
2705 West Lake Dr.
Taylor, Texas 76574
T: 512-248-3000
F: 512-225-7079

AUSTIN
8000 Metropolis Dr.
Bldg. E, Suite 100
Austin, Texas 78744
T: 512-225-7000
F: 512-225-7079

ercot.com

June 23, 2023

SUBMITTED VIA REGULATIONS.GOV

Michael S. Regan, Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, DC 20460

RE: EPA Docket ID No. EPA-HQ-OAR-2018-0794; FRL-6716.3-01-OAR; National Emission Standards for Hazardous Air Pollutants for Coal- and Oil-Fired Electric Utility Steam Generating Units (EGUs)

Dear Mr. Regan:

Electric Reliability Council of Texas, Inc. (ERCOT) respectfully submits these comments regarding the Environmental Protection Agency's (EPA) proposed amendments to the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Coal- and Oil-Fired Electric Utility Steam Generating Units (EGUs), commonly known as the Mercury and Air Toxics Standards (MATS), which was published in the Federal Register on April 24, 2023.

Background

ERCOT is the independent system operator (ISO) designated by the Public Utility Commission of Texas (PUCT) for the purpose of managing the flow of power on the ERCOT transmission grid, which serves the majority of customers in the State of Texas. Texas law assigns ERCOT a number of critical functions, including the responsibility to "ensure the reliability and adequacy of the regional electrical network." Tex. Util. Code § 39.151(a)(2). ERCOT's most basic function in ensuring system reliability is to individually dispatch hundreds of generators located across the system to match the system demand (or "load") at every moment of every day while observing both the physical and stability limits of the transmission network that transports power between generation and load. ERCOT is also registered with the North American Electric Reliability Corporation (NERC) as the sole Reliability Coordinator (RC) and Balancing Authority (BA) for the ERCOT region under the reliability framework in section 215 of the Federal Power Act. In these roles, ERCOT has the ultimate responsibility to direct the operation of the ERCOT power grid to ensure generation and load are balanced and to take all appropriate actions needed to ensure the security of the grid during emergency conditions.

Reliability Concerns with the Proposed Amendments to the MATS

ERCOT is concerned that the proposed amendments to the MATS could impact grid reliability in the ERCOT region of Texas in several possible ways. Primarily, due to the required cost of improvements, some portion of the affected units could simply retire instead of coming into compliance with the new requirements. These retirements could occur before new generation

could be built to replace them. During this potential interim period, a lack of dispatchable generation could significantly increase the likelihood of rotating outages during periods of severe weather, unnecessarily jeopardizing the safety of Texans and causing economic harm.[1]

For EGUs that do elect to make the changes necessary to come into compliance, ERCOT understands, based on communications with owners of affected EGUs, that the proposed standard would increase the occurrence of forced outages and derates required to allow for the installation, tuning, and maintenance of electrostatic precipitators, baghouses, and other equipment required by the proposed standard. The increased outage rate presents a reliability risk for the ERCOT system that is already forced to tightly coordinate the current level of generation outages while maintaining system reliability. The additional outages resulting from the implementation of the standard will also increase the complexity of coordinating maintenance outages for the remaining generation fleet.

ERCOT also understands that the standard could create new compliance issues for certain EGUs that may require extended cold starts, jeopardizing their continued availability to ERCOT. ERCOT has a number of plants that require extended startups. Potentially including allowances for startup conditions could enable some of these EGUs to continue operation until more compliant generation is built. This would help facilitate a smooth transition to newer plants that meet the requirements without risking the reliability of the electric grid.

ERCOT is also concerned that the emissions limits that EPA has proposed for oil-fired units could impede ERCOT's ability to rely on fuel-oil-fired generation in cases where the natural gas delivery system may not be capable of serving ERCOT's gas-fired generation fleet. As a result of the significant grid outages during Winter Storm Uri in 2021, the Public Utility Commission of Texas directed ERCOT to develop a firm fuel product—now called "Firm Fuel Supply Service"—which incentivizes the addition and maintenance of alternative fuel capability at EGU facilities primarily fueled by natural gas.[2] ERCOT last year secured 2,940 MW of alternative fuel capability from EGUs as part of its initial procurement of this service.[3] As a general rule, these EGUs rely on fuel oil as an alternative fuel source. Impeding these EGUs' ability to utilize fuel oil in the infrequent event of a natural gas supply disruption—such as occurred during Winter Storm Uri—would decrease the resiliency of the system during severe cold weather.

With regard to EPA's request for comments on lowering the level of allowable non-Hg metal filterable particulate matter emissions from the proposed level of 0.01 lb/MMBtu to an even lower standard of 0.006 lb/MMBtu, ERCOT understands from discussions with some owners of affected EGUs that the upgrades necessary to meet this lower standard could be cost-prohibitive to install. Assuming that is correct, adopting such a standard could result in additional unplanned retirements of EGUs, which will present an additional reliability concern for ERCOT—especially given the proposed implementation timeframe.

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[1] See Winter Storm Uri 2021 (texas.gov) and Texas winter storm official death toll now put at 246 | The Texas Tribune

[2] The PUCT's order directing ERCOT to develop a "firm fuel product" as part of a suite of market design changes is available at https://interchange.puc.texas.gov/Documents/52373_336_1180125.PDF.

[3] *See* ERCOT letter of September 27, 2022 to PUCT Commissioners, available at https://interchange.puc.texas.gov/Documents/52373_379_1241977.PDF.

ERCOT urges the EPA to consider these important reliability concerns in deciding whether to adopt the proposed amendments to the MATS rule.

Reliability Safety Valve

Additionally, ERCOT requests that EPA adopt a comprehensive "reliability safety valve" (RSV) that would allow grid operators like ERCOT to rely upon EGUs subject to EPA emissions restrictions, including restrictions imposed by the MATS rule, when necessary to serve system demand in the unusual event of an actual or anticipated grid emergency. EPA has previously approved an RSV in the context of the Clean Power Plan. ERCOT believes a similar measure that applies more broadly across all EPA-regulated emissions would be appropriate because there are multiple EPA requirements that restrict operations of coal- and gas-fired units limiting the availability of those plants to the grid.

ERCOT recommends that an RSV should be available when the grid operator has declared or reasonably expects to declare an emergency under the grid operator's rules. In ERCOT, an emergency can be declared when total system capacity reaches a very low threshold relative to load and the required level of reserves[4] or when ERCOT is not able to operate the transmission system within defined limits using its normal operational tools.[5] Limiting the availability of an RSV to an emergency or reasonably anticipated emergency condition would ensure that the exceedance of any allowance is narrowly tailored to the most exigent of operating circumstances. ERCOT submits that, in the case of a grid emergency, the incremental value of the additional generation supply to the health and safety of the public is far greater than any detrimental public health impact attributable to the exceedance of a permitted allowance.

If desired, ERCOT would be happy to work with the EPA to help design an RSV that would appropriately optimize EPA's environmental aims while ensuring ERCOT can maintain the reliability of the Texas electric grid.

ERCOT greatly appreciates the EPA's consideration of these comments and would be happy to discuss these matters with the EPA in further detail.

Respectfully Submitted,

/s/ Woody Rickerson
Dwayne W. Rickerson, P.E.
Vice President, System Planning and Weatherization

[4] ERCOT Protocols § 6.5.9.4.2, available at:https://www.ercot.com/files/docs/2022/05/31/June%201,%202022%20Nodal%20Protocols.pdf
[5] ERCOT Nodal Operating Guide § 4.3, available at: https://www.ercot.com/files/docs/2022/06/10/June%201,%202022%20Nodal%20Operating%20Guide.pdf

January 15, 2016

VIA ELECTRONIC MAIL TO: a-and-r-docket@epa.gov

Dr. Nick Hudson
Energy Strategies Group, Sector Policies &
Programs Division (D243-01)
U.S. Environmental Protection Agency
Research Triangle Park, NC 27711

Attention: Docket ID No. EPA–HQ–OAR–2009–0234

Re: Comments of the National Mining Association on Supplemental Finding That It Is Appropriate and Necessary To Regulate Hazardous Air Pollutants From Coal- and Oil-Fired Electric Utility Steam Generating Units, 80 Fed. Reg. 75,025 (Dec. 1, 2015)

Dear Dr. Hudson:

The National Mining Association (NMA)[1] submits these comments in response to the proposed supplemental finding that it is appropriate and necessary to regulate hazardous air pollutants (HAPs) from coal and oil-fired electric utility steam generating units (EGUs), 80 Fed. Reg. 75,025 (Dec. 1, 2015). In addition to submitting these comments NMA incorporates by reference the comments of the Utility Air Regulatory Group of which NMA is a member.

NMA urges EPA to rescind and re-propose its "appropriate and necessary" finding for electric generating units. EPA's proposed finding is based on an arbitrarily limited view of the information the agency should examine in assessing the costs and benefits of regulation. EPA seems more interested in quickly reaffirming the flawed appropriate and necessary finding it made when it issued the MATS rule rather than conducting the type of searching analysis the Supreme Court called for in *Michigan v. EPA*, 135 S. Ct. 2699 (2015), where the Court directed the agency to "consider cost-including, and most importantly, cost of compliance **before** deciding whether regulation is appropriate and necessary." (Emphasis added.) Despite this rebuke from the Court,

[1] NMA's membership includes the producers, transporters and consumers of coal. Our member companies mines over 75 percent of the coal produced annually from operations located in 26 states. Most of the coal produced by NMA members is used by coal-fired EGUs subject to this rulemaking.

our analysis of the Supplemental Finding demonstrates that it, like the agency's prior determination, is wrong in reaching the conclusion that it is appropriate and necessary to regulate HAP emissions from EGUs.[2]

1. EPA has completely failed to consider the effect of its rule on coal.

Four years after MATS was issued, with the damage the rule caused in the coal industry all but complete, EPA maintains its preposterous view reached in the MATS Regulatory Impact Analysis (RIA) that the rule will have little effect on coal. EPA has no new analysis to support this assertion as no such analysis can be constructed. It simply proposes to limit its consideration of costs to the information it included in the RIA, including the RIA forecast that the rule would result in the retirement of less than 5 GW of coal capacity.[3] By limiting its cost consideration in this fashion, the agency believes it can erase the actual experience of the last four years and the hardship the agency has wrought on our nation's coal communities and ratepayers who were previously the beneficiaries of affordable, reliable coal-based electricity.

As numerous commenters, including NMA, told EPA during the MATS rulemaking, the rule would cause a wave of coal unit retirements. Unfortunately, events have confirmed the accuracy of these forecasts and disproved EPA's. Between 2012 when the rule went into effect and 2016 when the rule's compliance period ends, almost 60 GW of coal capacity will have retired, including units that have already retired or, for 2016, have announced their retirement.

Coal-Fired Generating Unit Retirements by Year – Actual and Announced (MW)

Year	Annual	Cumulative
2012	12,601	12,601
2013	8,220	20,821
2014	5,568	26,389
2015	20,728	47,116
2016	12,065	59,181

Source: Energy Ventures Analysis

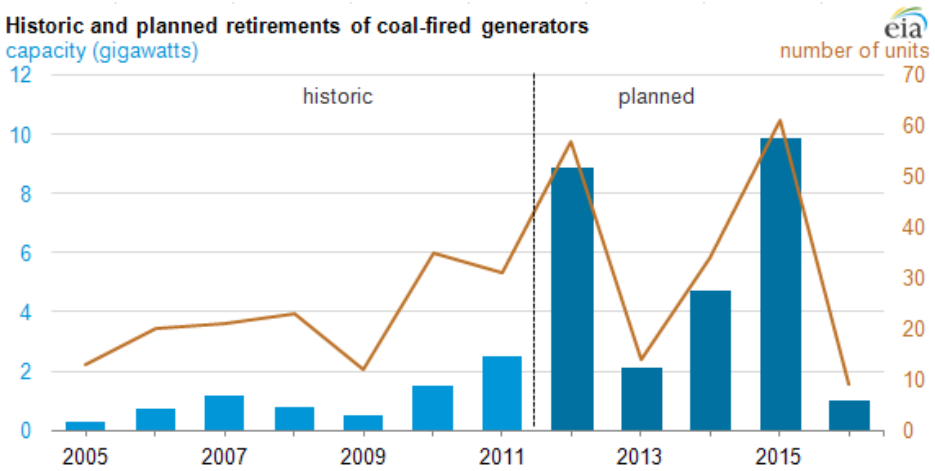
According to statements made by the utilities announcing the retirements, virtually all of these closures are either fully or partially attributable to MATS and other EPA regulations.[4]

[2] To ensure a complete record here, NMA attaches and resubmits its MATS comments.
[3] EPA Regulatory Impact Analysis for the Final Mercury and Air Toxics Standards, page 3-17.
[4] See attached compilation from the American Coalition of Clean Coal Electricity.

Prior to the final MATS rule, total retirements of coal-fired capacity for the previous 11 years were just 9,745 MW, 3.1 percent of the nation's existing coal-fired capacity. Because of MATS, power companies retired more capacity than in all of those years combined—10,308 MW—in 2012 alone.

Shortly after MATS was published, the Energy Information Administration ("EIA") recognized that this rule would contribute to a wave of retirements of coal-fired power plants. EIA published an article in July 2012 reporting the surge of planned retirements, which would peak in 2015, the year the initial MATS compliance period ended. This is described graphically in the chart shown below.

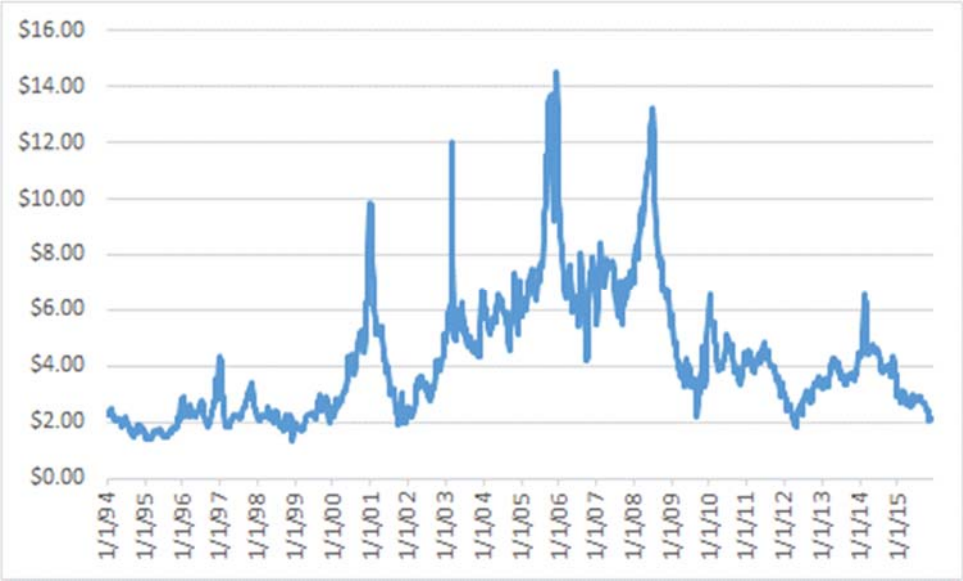
Planned Retirement of Coal-Fired Generators, 2012 (MW)[5]



In public statements and in litigation EPA has blamed the decline in natural gas prices for the coal unit retirements. Natural gas prices have certainly affected the amount of actual coal generation, but low natural gas prices did not lead to the plant retirements. While natural gas prices did fall in 2012 from 2011, the decline was not to unusually low levels. Gas prices in 2012 were still higher than the average price of natural gas throughout the 1990's, as shown below. However, coal plants did not retire in any significant quantities throughout that decade of low gas prices. The coal industry is familiar with and has previously experienced the impact of cyclical, non-sustainable low natural gas prices. The massive retirement of coal plants began in 2012, coinciding with the MATS rule, not the decline in gas prices. Natural gas prices recovered in 2013 and 2014, yet coal plants continued to retire in these years also.

[5] Sources: EIA, "27 gigawatts of coal-fired capacity to retire over next five years", July 27, 2012 at http://www.eia.gov/todayinenergy/detail.cfm?id=7290#.

Henry Hub Weekly Spot Natural Gas Price ($/mmBtu)[6]



EPA's reliance on its stark under-prediction of the number of retirements as a result of MATS taints every aspect of EPA's new appropriate and necessary finding. Having understated the retirements in the RIA, that document also understates the overall compliance costs of the rule, the resulting impact to electric ratepayers, the amount of coal production that would be lost, the number of miners that would be laid off, and the impacts to coal communities and coal states that would ensue. Forty thousand coal miners have lost their jobs since 2012. These layoffs have occurred in some of the poorest areas of the country, where coal-mining provides some of the highest-paying jobs. Whole communities and a number of states are dependent on the revenue the coal industry brings.

NMA and others warned EPA, in comments on the MATS rulemaking, of the chain of devastation the rule would create, but EPA chose to discount those warnings. In light of subsequent events, it is completely arbitrary for EPA to continue to pretend that the rule has had little impact on coal.

2. EPA Has Not Explained Why It Ignores the Actual Retirements Caused by the Rule.

EPA offers no explanation for ignoring the actual number of retirements the rule caused. Instead, EPA simply says, without elaboration, that it has chosen to restrict its examination of cost impacts to the information in the RIA because doing so is

[6] Source: EIA at http://www.eia.gov/dnav/ng/ng_pri_fut_s1_w.htm.

"reasonable."[7] It cannot be reasonable, however, to continue relying on cost information that has demonstrably been proven wrong time-and-time again.

The closest EPA comes to an explanation for relying on incorrect data in the RIA is the assertion that the public had an opportunity to comment on that information and EPA responded to those comments.[8] In the first place, it is not true that EPA conducted notice-and-comment rulemaking on whether regulation of EGU HAP emissions is justified in light of the regulatory costs. During the rulemaking and throughout the litigation, EPA's firm position was that cost information played no role in its appropriate and necessary finding. As a consequence of this view, the agency's main response to the cost information proffered by NMA and others was that such information was irrelevant.[9] At no point did EPA ever examine the cost information submitted by commenters in light of the ultimate question of whether it was appropriate and necessary to regulate.

More fundamentally, even if EPA had fully considered the cost information submitted in the record that would not justify EPA's failure to rely on information from the RIA that has proved to be faulty. The Supreme Court required EPA to make a de novo appropriate and necessary determination that, for the first time, considers costs and benefits. That determination must be based on cost information that is reliable and accurate. EPA has no excuse for not considering costs associated with the large number of retirements that the rule caused. It must redo its entire RIA cost analysis in light of that information.

3. EPA must accept new evidence on the purported benefits of the rule and reconsider the evidence already submitted as to the lack of benefits

EPA states that it is not accepting comments on its finding that "mercury and other HAP emissions are hazardous to public health and the environment." EPA says the public has already commented on this finding and that the agency has already responded to all significant comments.[10]

As discussed above, however, because EPA is making a de novo appropriate and necessary finding, EPA cannot exclude relevant evidence. EPA must at least reconsider the evidence it relied on in its previous finding in determining now whether the cost of regulation is justified by the benefits. Because EPA did not weigh costs and benefits in its prior appropriate and necessary finding, it was of the opinion that virtually any evidence of a risk to health or the environment would justify a decision that

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[7] Legal Memorandum Accompanying the Proposed Supplemental Finding that it is Appropriate and Necessary to Regulate Hazardous Air Pollutants from Coal- and Oil-Fired Electric Utility Steam Generating Units ("Legal Memorandum") at 18.
[8] 80 Fed. Reg. at 75,031.
[9] *Id.* at 9327.
[10] *Id*. at 75,028.

regulation was appropriate and necessary. It is now EPA's task to judge for the first time whether the benefits it relies on are significant enough to justify the costs. This applies to asserted impacts of all HAP emissions, but applies most critically to the asserted impacts of acid gas emissions, as more fully discussed below.

4. EPA Cannot Mask the Impacts of the Rule by Spreading those Impacts Over the Entire Power Sector.

In an attempt to make the $9.6 billion annual cost of the rule seem small, EPA compares the MATS costs with total utility industry costs.[11] In EPA's view:

- The $9.6 billion annual cost of the rule is only a small fraction of the *total annual industry-wide dollar value of electricity sales*;
- The annual capital expenditures to comply with MATS are again only a small fraction of *all utility industry annual capital expenditures*;
- The impact of the rule on the *average national* electricity rate are small;
- EPA's estimate of 4.7 GW of retirements represents only a minimal amount *of total electric generating capacity*: "This analysis indicates that the vast majority of the generation capacity in the power sector directly affected by the requirements of MATS would be able to absorb the anticipated compliance costs and remain operational."

These comparisons of MATS costs with national-level costs are meaningless. First, as noted, they are based on EPA's fundamentally flawed RIA that far understated the number of coal unit retirements and thus underestimates the cost of the rule.

Additionally, national level figures are of little use in assessing the cost of MATS in the real world. For instance, no one pays an average national electricity rate; electric consumers pay the rate charged by their local utility which in turn reflects that utility's costs.

As EPA is aware, coal-fired generation is predominately confined to the middle and southeastern parts of the country. The major population centers of California, the Pacific Northwest, New York, New Jersey, New England and peninsular Florida use very little or no coal generation. Obviously, the rule would not be expected to have and has not had much impact in those areas. Spreading the cost of the rule over the large populations served by utilities in these states therefore masks the impact the rule has on other states.

[11] *Id*. at 75,032-36.

Equally as obvious, the rule can be expected to have major impacts in coal-dependent states. Information submitted to EPA during the MATS rulemaking showed the possibility of more than 20 percent rate impacts regionally. For instance, heavy manufacturing and coal-dependent states like Ohio can expect prices to rise by approximately 23 percent.[12] Moreover, as the economy recovers and electricity demand increases the tightening of electric generation supplies resulting from the rule will inevitably force electric rates to rise.

EPA seems to recognize that the rule will have disproportionately high effects in coal-dependent regions, but dismisses those impacts with the statement that rates in these areas are lower than the national average.[13] The implication seems to be that EPA is justified in pursuing policies that raise electric rates in these areas because people can afford the increases. It is not EPA's job, however, to impose the energy policies of the coastal states—and the resulting high energy prices—on the rest of the country. In any event, the middle of the country on average has lower incomes than the coastal states and is therefore not in a position to absorb the higher costs. As NMA has repeatedly told EPA in comments, high energy prices produce their own set of negative health and welfare impacts, none of which are accounted for in EPA's new appropriate and necessary finding.

EPA's focus on the rule's national-level utility industry impacts also fails to address the specific impacts the rule will have on coal production, coal employment and coal communities. These impacts are clearly relevant to an analysis of the rule's costs.

5. EPA Must Separately Address Whether the Cost of Acid Gas Regulation Is Justified by the Benefit.

Another topic EPA tries to declare off limits is whether EPA could decide it is not appropriate and necessary to regulate one HAP if it is appropriate and necessary to regulate any other HAP. EPA's view is that this outcome is foreclosed by the court of appeals' decision in *White Stallion Energy Ctr., LLC v. EPA*, 748 F.3d 1222, 1233 (D.C. Cir. 2014) and by the terms of the issue the Supreme Court accepted for review in *Michigan v. EPA*, 135 S. Ct. 2699 (2015).

EPA is incorrect. *White Stallion* determined only that, as a matter of *Chevron* step two deference, "EPA's conclusion that it **may** regulate *all* HAP emissions from EGUs must be upheld," even if it is not appropriate and necessary to regulate one particular EGU HAP emissions. *White Stallion*, 748 F. 3d at 1245 (bold added, italics in original). This EPA exercise of discretion may have been, as the *White Stallion* court found; reasonable in light of the court's finding that costs are irrelevant in the appropriate and necessary finding. However, given the Supreme Court's ruling that costs are relevant, it is now unreasonable for EPA to neglect, on a pollutant-by-pollutant

[12] See NMA comments at 3.
[13] 80 Fed. Reg. at 75,035.

basis, whether regulation may be inappropriate and unnecessary given an extreme mismatch of costs and benefits.

Moreover, the relative costs and benefits of regulating each particular EGU HAP emission remains relevant even if EPA is required to regulate all EGU HAP emissions on a finding that it is appropriate and necessary to regulate one particular such emission. In considering whether it is appropriate and necessary to regulate all EGU HAP emissions, certainly one relevant factor would be that regulating one HAP would impose extraordinarily high costs for almost no benefit. Accordingly, EPA could decide that the costs and benefits of regulating one HAP is so out of balance that regulation of any HAPs is not warranted.

In this regard, it is worth reiterating the severe lack of balance between the costs and benefits of regulating acid gas emissions. On the cost side, acid gas regulation comprises about half of the $9.6 billion annual cost of the rule.[14] On the benefits side, EPA produced no evidence that acid gas emissions from EGUs endanger human health. Neither the 1998 Utility Study nor the only study that EPA subsequently performed of the health risks of electric generator acid gas emissions,[15] found any such risks.

The best EPA could do in the regulatory preamble as to health impacts was to express "concern" that acid gases in general are known to "contribute to chronic non-cancer toxicity," without making any finding that acid gases in the quantities emitted by electric generators pose a meaningful risk of doing so.[16] The only actual analysis EPA performed to determine whether acid gas emissions from electric generators create a health concern concluded that "individuals are not exposed to acid gas emissions from Utility Units at concentrations which pose hazards to public health."[17]

Even EPA's findings as to possible environmental impacts of electric generator acid gas emissions lacked a substantive foundation. EPA's "evidence" of the environmental impacts of these emissions consists of EPA's general claim that "[i]n areas where the deposition of acids derived from emissions of sulfur and NO_x are causing aquatic and/or terrestrial acidification, with accompanying ecological impacts, the deposition of hydrochloric acid *could* exacerbate these impacts."[18] That may be true, but it does not prove – or even lead to an inference – that *electric generators* emit acid gases in sufficient amounts, given EPA's other regulations, to create a material environmental concern. The Utility Study did not conclude that electric generator acid gas emissions resulted in environmental harm, and EPA did not conduct any further study of possible environmental impacts of electric generator acid gas emissions.

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[14] See Comments of the Utility Air Regulatory Group, Aug. 4, 2011.
[15] 70 Fed. Reg. at 16,007,
[16] *Id*.
[17] *Id*. at 16,007.
[18] *Id*. at 25,050 (emphasis added).

The only acid gas study that EPA relied on was one study of hydrochloric acid deposition in the United Kingdom, which EPA cites for the proposition that (a) hydrochloric acid is highly mobile in the environment, (b) hydrochloric acid can transport longer distances than previously thought, and (c) hydrochloric acid *can be* a larger driver of acidification than previously thought.[19] EPA, however, did not even try to analyze the impact, if any, of *electric generator* emissions of hydrochloric acid in the United States and, as a result, could not point to even a single instance in which domestic electric generator hydrochloric acid emissions have affected acid deposition anywhere or otherwise created an environmental impact.[20]

In fact, the "evidence" on which EPA most relied in concluding that acid gases are worthy of regulation is that acid gases are listed under CAA Section 7412(b) and that electric generators emit more hydrogen chloride and hydrogen fluoride than other source categories[21]. But those facts, in and of themselves, are not significant given that those emissions, even when combined with directly emitted acid gas emissions from all other sources, do not represent more than a nominal percentage of emissions that have the potential to result in acidification.[22]

Given the high costs and negligible benefits of regulating EGU acid gas emissions, EPA has two choices. It may choose to regulate other HAP emissions while not regulating acid gases, or it may choose not to regulate EGU HAP emissions at all. What it cannot do, however, is simply ignore the stark mismatch of the costs and benefits of regulating acid gases.

For the above reasons, NMA urges EPA to rescind and re-propose its appropriate and necessary finding based on a more complete analysis of costs and benefits.

Regards,

Bruce Watzman

Enclosures

[19] 77 Fed. Reg. at 9,362.
[20] See EPRI Comments on Proposed HAPs MACT Rule, 4 August 2011, at § 3.16.
[21] 76 Fed. Reg. at 25,005.
[22] See EPRI Comments on Proposed HAPs MACT Rule, 4 August 2011, at § 3.16.

THE NATIONAL MINING ASSOCIATION'S COMMENTS ON EPA'S PROPOSED NATIONAL EMISSIONS STANDARDS FOR HAZARDOUS AIR POLLUTANTS FROM COAL- AND OIL-FIRED ELECTRIC UTILITY STEAM GENERATING UNITS AND STANDARDS OF PERFORMANCE FOR FOSSIL-FUEL-FIRED ELECTRIC UTILITY, INDUSTRIAL-COMMERCIAL-INSTITUTIONAL, AND SMALL INDUSTRIAL-COMMERCIAL-INSTITUTIONAL STEAM GENERATING UNITS

76 Federal Register 24,976 (May 3, 2011)

Docket ID Numbers: EPA-HQ-OAR-2009-0234 (NESHAP action) and EPA-HQ-OAR-2011-0044 (NSPS)

August 4, 2011

VIA ELECTRONIC MAIL TO: a-and-r-docket@epa.gov

U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Re: Comments of the National Mining Association on the above-docketed proposed rules; 76 Fed. Reg. 24976 *et seq.*, May 3, 2011.

Dear Ladies and Gentlemen:

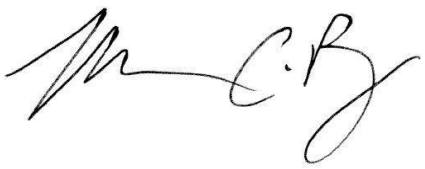
The National Mining Association ("NMA") takes this opportunity to submit the following comments on the Environmental Protection Agency's ("EPA") proposed rules, as titled above, published in the *Federal Register* on May 3, 2011.

NMA's membership includes the producers, transporters and consumers of coal. Our member companies mine over 75 percent of the coal produced annually from operations located in 26 states. Most of the coal produced by NMA members is used by coal-fired utilities subject to this proposed rulemaking.

NMA's members also include the transporters of coal. For example, railroads deliver about two-thirds of all coal to coal-fired units. NMA's members include the producers of metals, and industrial and agricultural minerals. Their operations are major consumers of electricity as a raw material or feedstock. Because energy costs comprise a substantial part of their operating costs, this rulemaking will also have a material impact upon on their global competitive position. NMA's membership also includes the manufacturers of mining and mineral processing machinery and supplies. This rulemaking will affect both their markets as the suppliers of machinery and equipment for coal mines and their competitive position as manufacturers bearing the brunt of higher energy prices. In sum, this rulemaking is of utmost importance to NMA.

Please let me know if you have any questions regarding NMA's comments. I can be reached directly at (202) 463-2608 or via email at tperry@nma.org.

Sincerely,



Thomas C. Perry
Director of Air Quality

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Attachment 1—Senator Lisa Murkowski, "FERC Responses Raise New Concerns About Reliability," Press Release (Aug. 3, 2011).

Attachment 2—FERC Response to Senator Murkowski, Chairman Wellinghoff (Aug. 1, 2011).

Attachment 3—FERC Response to Senator Murkowski, Commissioner Moeller (Aug. 1, 2011).

Attachment 4—FERC Response to Senator Murkowski, Commissioner Spitzer (Aug. 1, 2011).

Attachment 5—Comments of the National Mining Association on the Industrial Boiler MACT rule, Docket Nos. EPA-HQ-OAR-2002-0058 and EPA-HQ-OAR-2006-0790 (Aug. 23, 2010).

Attachment 6—Comments of the National Mining Association on Federal Implementation Plans to Reduce Interstate Transport of Fine Particulate Matter and Ozone, Docket ID Nos. EPA-HQ-OAR-2009-0491 (Aug. 2, 2010).

Attachment 7—Individually-listed Analyses in Table 3: Summary of Coal-Fired Retirement Projections.

EXECUTIVE SUMMARY

I. THE PROPOSED RULE REPRESENTS A HUGE REGULATORY BURDEN FOR LITTLE ENVIRONMENTAL GAIN

The Environmental Protection Agency ("EPA") has now either planned, proposed or finalized several interrelated and costly regulations under the Clean Air Act ("CAA") aimed at substantially reducing the usage of coal as a fuel source in this country. The proposed rule is no exception with its EPA-estimated $10.9 billion in annual compliance costs. Further exacerbating the situation is EPA's new source emissions standards that make it virtually impossible for advanced coal-based generating capacity to be built in this country. The reality is that as EPA continues on its course of "leveling the playing field"[1] for electric power generation in the United States, the agency appears unwilling to grapple with the fundamental fact that coal is the only sustainable fuel, at scale, that can reliably meet our growing electricity needs. In a world of increasing global scarcity, the United States cannot afford to disregard the importance of its abundant coal resources.

A. The Essential Role of Coal in the U.S. Economy

Energy is as basic to human life as food, water, clothing or oxygen.[2] Access to secure, affordable, abundant and sustainable energy from coal is the engine that has driven American economic might for more than a century. These energy attributes are essential to American economic success. Expensive energy chokes off economic recovery, punishes family budgets, sends factories overseas and determines winners and losers in global competition.

Coal is fundamental to how the nation produces electricity. Approximately 46 percent of electricity is derived from combusting coal. Coal is also by far the nation's most abundant source of energy, constituting 94 percent of the nation's fossil fuel resources. The United States has nearly 261 billion tons of recoverable coal reserves, according to the Energy Information Administration, which is a 240-year supply at current rates of use.

The correlation between coal-fueled electricity and economic growth is near-perfect.[3] For example, states that rely predominantly on coal generation are

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[1] 76 Fed. Reg. 24976, 24979 (May 3, 2011).

[2] International Energy Agency, World Energy Outlook, 2009; World Coal Institute, "Coal Tackling Poverty," 2007; "Mortality Reductions from Use of Low-Cost Coal-Fueled Power: An Analytical Framework," Analysis by Daniel E. Klien, Twenty-First Strategies, LLC, McLean, Va., and Ralph L. Keeney, Research Professor, Fuqua School of Business, Duke University, 2002; World Health Organization, 2007 data.

[3] Based on analysis of electricity from coal in terawatt hours and global GDP from 1970 to 2010, reported by International Energy Agency, World Energy Outlook, 2009, and Energy Information Administration, International Energy Outlook, 2010.

generally the states with the lowest electricity rates. Twenty of the twenty-five states with the lowest electricity costs rely upon coal generation for at least 40 percent of their electricity generation—and all have rates below the national average. It is no coincidence that these states also have the highest concentrations of manufacturing.

Moreover, advanced coal technologies provide a path forward for both retaining the country's competitive edge and being environmentally conscious. Supercritical coal technologies deployed in new coal-based power plants increase efficiencies and reduce emissions by 20 percent as compared to the national average of the existing coal-based plants. The next generation of ultra-supercritical technologies will produce even higher efficiencies and a corresponding reduction in emissions of 35 percent below the existing fleet of coal-based power plants.[4]

B. EPA's Cost Estimate is Significantly Understated

EPA's proposed rule disregards these important and fundamental contributions. Moreover, even in the face of widespread retirements and sharply increasing electric rates, EPA still continues to claim that these rules are flexible and common-sense without any sort of credible cumulative cost analysis to support this claim. NMA has repeatedly demonstrated the need for such an assessment, along with providing an analytical framework for completing this important task. Without such an assessment, EPA's cost estimates are essentially meaningless. EPA requires cumulative assessment under the National Environmental Policy Act because assessing individual actions masks the overall effects that a series of related actions will produce. For the same reason, EPA utilized cumulative analysis to examine the effects of power plant emissions of hazardous air pollutants ("HAPs") in this rulemaking. EPA's rule-by-rule cost-benefit analysis, including the one here, similarly hides the true impacts of the agency's overall program of power sector regulations.

EPA's estimated cost of this regulation is $10.9 billion per year, a cost that this economy can ill-afford to bear. But even that number is understated given that EPA's underlying cost analysis suffers from a number of glaring deficiencies in addition to the agency's failure to assess the cumulative costs of the rule. First, the agency's assumption that many units will—56 GWs worth—be able to meet the stringent acid gas standard by using dry sorbent injection ("DSI") as an alternative to installing costly scrubbing technology at over ten times the cost is misguided. There is a paucity of evidence in the rulemaking demonstrating that DSI will be effective at removing SO2 emissions at nearly as many units anticipated by EPA. Second, EPA fails to account for the age of existing scrubbing technology in erroneously assuming that approximately half of the fleet will meet all of the NESHAPs without further need of retrofitting. Third, overlapping compliance

[4] Janos M. Beer, Massachusetts Institute of Technology, *Higher Efficiency Power Generation Reduces Emissions*, National Coal Council Issues Paper 2009.

obligations like the Cross-State Air Pollution Rule ("CSAPR") will effectively foreclose the option of using DSI as those units will need to install costly scrubbing technology in order to comply with that regulation. Taken together, these mistaken assumptions demonstrate that EPA's cost estimate is biased low and the projected 9.9 GW of early coal retirements is clearly understated.

Thus, as the National Economic Research Associates ("NERA") recently projected, based on the impact of this rule and the recently finalized CSAPR,[5] compliance costs for the electric sector are a staggering $18 billion per year. The study also estimates that nationwide average retail electricity prices rise by 11.5 percent, and heavy manufacturing states such as Ohio can expect prices to rise by approximately 23 percent. These rules will force Americans to pay more for electricity, including the cost of natural gas, and precipitate significant job losses not only in coal production and transportation but also in the manufacturing sector.

C. EPA's Benefits Analysis is Equally Flawed

EPA attempts to justify the proposed rule based on an exaggerated claim that the proposed rule will result in $52 to 139.4 billion in health benefits. However, the facts paint a different story as only a *de minimus* amount—*or less than 0.01 percent of this total benefits estimate*—are expected to result from regulating the hazardous air pollutants ("HAPs") that are ostensibly the subject of this rulemaking. EPA readily admits virtually all of its claimed benefits result from the incidental collateral reduction of SO2 emissions, which in turn, reduces the atmospheric concentrations of PM2.5, thus (according to EPA) saving lives and improving health. However, PM2.5 is already subject to stringent regulation under the National Ambient Air Quality Standards ("NAAQS") program and will be further regulated by the recently finalized CSAPR. Thus, EPA appears to be double-, and perhaps triple-counting health benefits—or relying on benefits that would have otherwise occurred through implementation of the NAAQS program to enhance the appearance of justification for this rule and CSAPR.

Even more telling is the fact, as demonstrated by Figure 6-15 of the Regulatory Impact Analysis ("RIA"), almost the entire alleged PM2.5 benefits stem from exposures that occur below the level of the PM2.5 NAAQS. Yet EPA set that NAAQS at a level that, as required by the CAA, the agency deems protective of human health with an "adequate margin of safety." Thus, despite its statements in the preamble, in reality, even the agency does not believe the proposed rule will produce benefits from reducing PM2.5.

The agency is preparing to propose a new PM2.5 NAAQS, and that standard may be lower than the current NAAQS. Until it does so, however, it is inappropriate for EPA to adopt rules based on claimed benefits below the current NAAQS level.

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[5] *See* http://www.americaspower.org/NERA_CATR_MACT_29.pdf for study results [hereinafter "NERA Study"].

Until changed, the current 15 μg/m^3 NAAQS represents EPA's judgment of the standard necessary to protect human health with a margin of safety. In any event, the lowest standard contemplated by EPA is 11μg/m^3. Even at this level, Figure 6-15 demonstrates that *80 percent* of the asserted benefits would still be occurring at levels below the NAAQS.

In sum, both EPA's cost and benefits calculations are fundamentally flawed. The proposed rule will be far more costly than beneficial, and EPA's imposition of large costs on the economy by forcing a reduction of the use of coal for electricity is completely unjustified by any corresponding health benefit.

II. EPA'S RULEMAKING PROCESS IS LEGALLY DEFICIENT UNDER THE CLEAN AIR ACT

EPA has made it extremely difficult, indeed impossible, for the public to have a meaningful opportunity to provide comments on the proposed rule. EPA's haste in finalizing the proposed rule by November 2011 has resulted in insufficient time for comments, only ninety days despite the extraordinarily complex nature of the regulation.

The rushed schedule has resulted in at least one significant error in setting the "maximum achievable control technology" ("MACT") standards. On May 5, 2011, the Utility Air Regulatory Group ("UARG")[6] sent a letter to EPA identifying a critical conversion error in the agency's calculation of mercury emissions resulting from errors in half the mercury data used in new and existing MACT floors that were 1000 times lower than actually measured. EPA admitted the error, but without proper correction, the public is left to sift through the docket and discern whether to comment on the standard in the supplemental document or the one proposed in the *Federal Register*.

Another fundamental error in EPA's rulemaking process is the agency's undocumented and unsupported claims of key stakeholder collaboration to "safeguard[ing] completely against any risk of adverse impacts on electricity system reliability."[7] NMA can find no evidence of these consultations in the rulemaking docket. Indeed Senator Lisa Murkowski (R-Alaska) on May 17 sent a letter to the Federal Energy Regulatory Commission ("FERC") seeking clarification on its collaboration with EPA.

It is inappropriate for EPA to claim that its rule will not create reliability problems based on discussions the agency claims it is having with government and non-government entities with direct authority over electric reliability, and yet not include a record of those discussions in the rulemaking docket, at the time of

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[6] NMA is a member of UARG.

[7] 76 Fed. Reg. at 25054.

publication, thus affording the public an opportunity to review and comment on these discussions.

Notwithstanding these deficiencies, on August 3—exactly one day before the close of the comment period—Senator Murkowski announced that she has received responses from FERC outlining the extent of its consultations with EPA.[8] Preliminary review of FERC's responses belies EPA's exaggerated assurances of electric system reliability. EPA must include FERC's responses, including a record of all the meetings between EPA, CEQ and FERC, data, and files as described in Appendix A and B of Chairman Wellinghoff's responsive,[9] in the rulemaking docket, extend the comment period, and provide an opportunity for public inspection and comment.

These critical errors, in addition to several others, are directly at odds with the rulemaking requirements under section 307(d). Under paragraph (d)(3), a "notice of proposed rulemaking…shall be accompanied by a statement of its basis and purpose," and this statement "shall include a summary" of the "factual data on which the proposed rule is based," and the "methodology used in obtaining the data and in analyzing the data." In addition, "[a]ll data, information, and documents referred to in this paragraph on which the proposed rule relies shall be included in the docket on the date of publication of the proposed rule." EPA has not followed these statutory commands, as "all data" on which the proposal is based were not included in the docket at the time the proposed rule was published in the *Federal Register*.[10]

This type of rulemaking does little to instill confidence that the agency is conducting an open and transparent process consistent with President Obama's Executive Order 13563. EPA must immediately seek an extension of the November deadline from the Court in order to conduct a legitimate rulemaking process.

III. EPA'S APPROPRIATE AND NECESSARY DETERMINATIONS ARE INCONSISTENT WITH THE CLEAN AIR ACT

Congress specifically carved out electric utility steam generating units ("EGUs") from section 112 compliance unless and until the Administrator determined that it is "appropriate and necessary after considering the results of"

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[8] Senator Murkowski's August 3, 2011 Press Release is filed contemporaneously with these comments as (Attachment 1).

[9] Chairman Wellinghoff's (Attachment 2), Commissioner Moeller's (Attachment 3), and Commissioner Spitzer's (Attachment 4) responses have all been filed contemporaneously with these comments.

[10] *See also Kennecott Corp. v. EPA*, 684 F.2d 1007, 1118 (D.C. Cir. 1982) ("In all circumstances, EPA's failure to include" documents that serve to explain the agency's "data" and "methodology" constitutes "reversible error," insofar as their absence "makes impossible any meaningful comment on the merits of EPA's assertions.").

the public health hazards study required by that section. *See* § 112(n)(1)(A). In 2000, EPA inappropriately determined that it was both appropriate and necessary to list EGUs as a source category and promulgate MACT standards under section 112.

To date, the validity of EPA's 2000 determination has never been fully ventilated in front of the D.C. Circuit Court. Accordingly, since EPA is reaffirming the 2000 determination as its basis for proposing the instant rule, the legality of that decision is squarely at issue.

EPA's appropriate and necessary findings are contrary to the CAA and do not comport with congressional intent. The agency's determination that it is "appropriate" to regulate EGU HAP emissions is based on a set of criteria outside of the congressionally-directed public health effects inquiry, including environmental impacts, emissions from other sources, and international cooperation. Injecting these factors makes the "appropriate" determination so broad that it renders the statutorily defined prerequisite for regulation meaningless. Congress clearly wanted EPA to focus and base its inquiry on "hazards to public health" posed by EGUs, not on a broad set of other factors. Otherwise, Congress would have simply listed EGUs from the outset. EPA conducted a proper inquiry into whether regulation of EGU HAP emissions was "appropriate" in 2005, but EPA has now abandoned that inquiry and replaced it with a flawed analytical approach to mask an insufficient factual basis for regulating. This is evidenced by the lack of benefit derived from aggressive mercury control.

Similarly, EPA's "necessary" finding is overly narrow and contravenes the purpose of the subsection. EPA believes that only those requirements that Congress directly imposed on EGUs through the CAA as amended in 1990—namely, the acid rain program—qualifies under the necessary analysis. This legal conclusion has no basis in the statutory language. Congress obviously knew that the 1990 amendments would result in numerous regulations potentially eliminating the need to regulate EGUs under section 112. Even though those regulations may have been promulgated later in time, the Clean Air Interstate Rule ("CAIR") and CSAPR for example, those measures qualify under the necessary analysis. Both of those programs stem from statutory authority in place as of or before adoption of the 1990 amendments. Thus, EPA has not provided a rational basis for its illogically narrow statutory construction. Additionally, doubts about the implementation of the NAAQS program is an unpersuasive basis for not including the results of these measures; compliance with the NAAQS is a legal obligation—that is why EPA promulgated first CAIR and then CSAPR. EPA's appropriate and necessary determination in 2000 as well as in the instant rulemaking is arbitrary, capricious and contrary to law.

IV. EPA'S HAP-BY-HAP APPROACH FOR DETERMINING THE MACT FLOOR IS UNLAWFUL UNDER THE CAA

EPA continues to set MACT floors based on an impermissible interpretation of the CAA. The proposed MACT standards are based on a pollutant-by-pollutant

approach—or "Franken-plant" approach—relying on a different set of best performing sources for each HAP standard.

Justice Ginsburg during the medical waste incinerator litigation offered the following baseball analogy to highlight the apparent lack of logic in EPA's approach. He reasoned based on the HAP-by-HAP approach, the "best" baseball player on the team would have the league's highest batting average, most home runs and would have the lowest earned run average every time he pitched. No such player exists. Likewise, no such unit can meet all of the proposed NESHAPs on a continuous basis without any operational or equipment upgrades.

Section 112 does not permit the agency to base MACT standards on a hypothetical amalgamation of ideal units nor does the statue permit the "emissions control" achieved by the best sources to be determined on a group of best performing units. If this was the intent of Congress, it would have added specific language so directing the agency.

The HAP-by-HAP approach violates the CAA because less than 12 percent of existing units can actually meet all of the proposed standards. In fact, NMA's review of the ICR data reveals that only 3 percent of the total population of units can meet all of the proposed standards. Moreover, this is a conservative approach as it likely overestimates the number of compliant units because measuring below the level once does not guarantee compliance on a continuous basis.

V. EPA'S NEW SOURCE STANDARDS VIRTUALLY ELIMINATE NEW COAL PLANTS

EPA's proposed standards for new coal units are so stringent that they will preclude construction of new coal plants that are subject to them. As reflected in the comments of the Union for Jobs and the Environment ("UJAE"), EPA provided UJAE with data as to which existing units comply with EPA's proposed standards. As set forth in that data, no existing units can comply with all of the new-unit standards. Since no single existing unit complies with all the standards, there is no basis to conclude that a new unit can likewise comply. EPA is required to set the new-unit standard based on the top performing similar unit in order to ensure that the proposed standard can actually be achieved under real world conditions. Since no existing unit, in fact, can meet all of EPA's new-unit standards, there is no basis to conclude that a new unit can do so.

Again, at the heart of this issue lies EPA's impermissible HAP-by-HAP approach for determining the MACT floor for new sources. One or more existing unit can meet each of the standards. But that does not mean that any existing unit can meet all of the standards. None can.

Adopting standards effectively banning new coal units amounts to a momentous change in national energy policy without discussion or analysis and far exceeds EPA's authority. Such a policy would be disastrous for the U.S. and would undermine the most effective strategy the U.S. can implement to reduce emissions

of all kinds while preserving stable and low electric rates. That strategy is to steadily over-time replace less efficient and older units with modern, efficient coal-based units. By a stroke of its pen, however, unless the new-unit standards have some basis in reality, EPA will impose a *de facto* moratorium on the use of coal for new electric generation.

VI. EPA'S PERFORMANCE STANDARDS RUN COUNTER TO THE CAA

EPA's performance standards are legally deficient in many respects. Under section 111, the agency must consider the cost of achieving such reduction. EPA has failed to adhere to this statutory command in setting standards of performance for SO2 and PM2.5. Moreover, this failure is even more disconcerting considering that EPA's own benefits analysis clearly states that the proposed rule has little to do with the HAPs at issue, but rather was adopted to create a regulatory backstop for reducing ambient concentrations of particulate matter. The agency must rescind the revisions to the standard of performance for subpart Da.

VII. EPA SHOULD EXERCISE ITS DISCRETION TO PROPERLY TAILOR THIS RULE

Assuming *arguendo* that EPA is correct in its assertion that the agency is legally compelled to regulate non-mercury HAPs absent an affirmative health-based finding, NMA urges the agency to exercise its discretion to properly tailor this rulemaking consistent with the underlying record. There are two specific instances where Congress has expressly provided EPA the tools to accomplish this objective.

Under section 112(d)(4), EPA should set a health-based standard for acid gases. Notwithstanding EPA's claims to the contrary, the agency has the data and regulatory experience to set these standards. Specifically, the agency reports that the hazard quotient for HCl never exceeded 0.05 in any of its risk assessments—or values that are 20 to 200 times lower than the reference concentration ("RfC") for HCl. Failure to exercise this discretion, therefore, cannot be based on a lack of information nor can the agency decline to exercise its discretion to preserve the alleged "co-benefits" from SO2 and PM2.5 removal.

Additionally, EPA should further subcategorize. In the Clean Air Mercury Rule ("CAMR"), the agency explicitly recognized the differences in emissions based on coal types. NMA is supportive of subcategorization for lignite—notwithstanding the beyond-the-floor measure—but the agency should further subcategorize based on the stringent acid gas standard. According to the data EPA provided to UJAE, the higher-sulfur coals supplied to plants in the eastern United States may not be able to achieve the proposed emissions rate even with scrubbing technology. As such, and without further subcategorization, the impacts on Midwestern coal suppliers will be particularly acute. NMA urges the agency to exercise its discretion to develop a properly tailored rule.

VIII. EPA SHOULD PROVIDE THE MAXIMUM AMOUNT OF TIME TO COMPLY WITH THIS RULE

Requiring virtually the entire existing fleet to retrofit within a three-year window will have serious ramifications on the amount of early retirements, affordability and reliability of electricity, and job losses. The CAA permits the EPA to provide an additional one-year for sources to comply with the new standards, and the agency has used this authority before. EPA should extend this fourth year to EGUs without exception.

Moreover, because the agency has failed to properly calibrate both the type of needed technology and the process utilities employ in developing and implementing a compliance program, EPA needs to investigate the flexibility afforded by the Presidential Exception under section 112(i)(4) of the CAA. Without the additional time afforded by this exception, the ability of utilities to comply even with a fourth year is in doubt.

In sum, based on the numerous legal and technical flaws pervading this proposed rule, including but not limited to the agency's fatally flawed section 112(n)(1)(A) analysis, NMA urges EPA to withdraw the proposed rule, correct and revise its analysis, and then re-propose based on a reasonable rulemaking schedule. Upon reissuing the rule, EPA must take a more holistic approach that properly tailors the regulation of EGUs under the CAA. Fundamental to this approach is conducting a much needed cumulative cost analysis.

DISCUSSION

I. THE PROPOSED RULE REPRESENTS A HUGE REGULATORY BURDEN FOR LITTLE ENVIRONMENTAL GAIN

Contrary to EPA's assertion that the proposed rule will create benefits far higher than its cost, the opposite is the case. The benefits are exaggerated and, in any event, will largely be achieved by other CAA programs. In contrast, the costs will be far higher than EPA supposes because the agency's cost projections are based on a number of overly optimistic assumptions as to compliance strategies.

A. The Utility MACT Rule Provides Little to No Incremental Health Benefit

The nation's air quality has improved dramatically since the enactment of the CAA and its subsequent amendments. As documented in the EPA's most recent air quality trends report, those improvements have occurred despite the major increase in economic and population growth:

> Between 1980 and 2009, gross domestic product increased 122 percent, vehicle miles traveled increased to 95 percent, energy consumption increased 22 percent, and U.S. population grew by 35 percent. During the

same time period, total emissions of the six principal air pollutants dropped by 57 percent.[11]

Mercury is no exception to this trend. The steps States and EGUs have taken to reduce criteria pollutant emissions have successfully curtailed those mercury emissions by approximately *58 percent* during this period.[12]

Despite these facts, EPA spends much of the RIA attempting to convince the public that the enormous costs to comply with this rule will easily be offset by the health benefits derived from aggressive command-and-control regulation. In fact, there is little evidence suggesting that any meaningful independent and incremental health benefits will result from the reduction of the HAPs at issue in the proposed rule. Of the purported $53 to 140 billion in total health benefits, the agency estimates that the direct health benefits stemming from the regulation of the relevant HAPs range from only $0.000005 billion to $0.006 billion per year—*or less than 0.01 percent of EPA's total benefits estimate*.[13]

1. Mercury emissions from EGUs pose little or no risk to public health

Beginning with EPA's 2000 determination, the focus of regulation has been tied to the reduction of mercury emissions from EGUs; and accordingly, the agency declares that the proposed standards will curtail the small remaining mercury emissions "by over 90 percent."[14] As the "HAP of greatest concern," it would logically follow that a significant portion of the purported health benefits would emanate from aggressive mercury control. This is not the case as only $450,000 to 5.9 million in estimated health benefits are attributable to mercury control.[15] Additionally, costly mercury curtailment options will only improve, based on questionable assumptions, the average IQ of the most sensitive population—children exposed *in utero* to high methylmercury ("MeHg") concentrations—by only 0.00209 IQ points, which is not even meaningful in an actual IQ setting.[16] Thus,

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[11] U.S. EPA, http://www.epa.gov/airtrends/aqtrends.html

[12] Willie Soon, PhD, "A Scientific Critique of the Environmental Protection Agency's National Emission Standards for Hazardous Air Pollutants [NESHAP] from Coal- and Oil-Fired Electric Utility Steam Generating Units and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional Steam Generating Units," [hereinafter "Dr. Soon Critique"] June 2011, available at: http://yosemite.epa.gov/sab/SABPRODUCT.NSF/432EEBD19DE16B2B852578AB0076B922/$File/Soon11_June10_comments_EPA_new+rules.pdf. quoting United Nations Environment Programme Report).

[13] RIA at 4-5.

[14] EPA letter to UARG, May 22, 2011.

[15] RIA, Executive Summary at 1.

[16] RIA at 5-2.

electric ratepayers in this country are going to be forced to incur billions of dollars in annual costs without any material benefit from reducing HAPs, which is the reason EPA ostensibly is adopting this rule.

It is unsurprising that so little health benefit would result from aggressive mercury regulation. EPA even admitted as much when it conducted a proper rulemaking on HAP emissions from coal-fired EGUs.[17] The agency conducted extensive modeling in preparation for CAMR to analyze how changes in mercury emissions from coal-fired EGUs would affect mercury deposition and MeHg levels in fish for a range of cases.[18] The results of the modeling revealed that total mercury deposition in the U.S. is not significantly impacted by mercury deposition from EGUs, and that EGUs contribute a "relatively small percentage" to fish tissue MeHg levels in the U.S.[19] More importantly, the agency concluded "[t]hat modeling reveals the implementation of section 110(a)(2)(D), through CAIR, would result in a level of [mercury] emissions *that would not cause hazards to public health*."[20]

In fact, those trends continue further bolstering the agency's conclusion in the 2005 Revision. Dr. Willie Soon states in his comments that power plants emit an estimated 41-48 tons of mercury per year. But U.S. forest fires emit at least 44 tons per year; cremation of human remains discharges 26 tons; Chinese power plants eject 400 tons; and volcanoes, subsea vents, geysers and other sources spew out 9,000-10,000 additional tons per year.[21] In short, the United States releases less than 5 percent of the 2,400 tons of mercury emitted per year due to human activities. U.S. coal-based power plants emit less than 2 percent of the global total of human-caused mercury emissions. Taking into account natural emissions, U.S. power plants contribute *less than one percent of total mercury emissions to the global pool*.[22]

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[17] 70 Fed. Reg. 15,994, 16,002 (Mar. 29, 2005) (emphasis added). Revision of December 2000 Regulatory Finding on the Emissions of Hazardous Air Pollutants From Electric Utility Steam Generating Units and the Removal of Coal- and Oil-Fired Electric Utility Steam Generating Units From the Section 112(C) List; Final Rule [hereinafter "2005 Revision"].

[18] 70 Fed. Reg. at 16,011-25.

[19] *Id.* at 16019-20; *see also* Dr. Soon critique at 3 (stating that EPA has ignored a distinguished group of scientists who concluded that a simple change in bacterial activity alone could "cause an increase in fish mercury concentrations, even as atmospheric deposition [from industrial mercury emissions sources] decreases").

[20] *Id.* at 16,004 (emphasis added).

[21] Dr. Soon critique at 2-3 (citing National Center for Atmospheric Research study, Wiedinmeyer & Friiedli (2007) *Environmental Science & Technology*, vol. 41, 8092-8098).

[22] Edison Electric Institute, *"Straight Answers About Electric Utilities and Mercury*," March 2008; available at: http://www.eei.org/ourissues/TheEnvironment/Documents/straight_answers_mercury.pdf.

EPA disregards these findings and reverts back to its legally and factually deficient 2000 determination in order to regulate mercury emissions from EGUs. Specifically, EPA's brings forward that flawed analysis by and through its current and single analysis of mercury risk.[23] The Mercury TSD, which EPA heavily relies on, is still based on several unsupported general concerns about mercury levels in the environment ostensibly designed to unearth some demonstrable evidence of "risk to public health." Like the 2000 determination, EPA has not adequately justified its "appropriate and necessary" determination.

The agency concedes as much stating, "[t]he Mercury Study also found that fish consumption dominates the pathway for human and wildlife exposure to MeHg and that there *was a plausible link* between anthropogenic releases of Hg from sources in the U.S. and MeHg in fish."[24] This "plausible link" was the foundation for the 2000 determination, which is interesting, given that this same finding was insufficient to support a regulatory determination in the Utility Study in 1998.[25] In this case "plausible" is very much a euphemism for unproven as the agency further admits that, "…it was not possible to quantify how much of the MeHg in fish consumed by the U.S. population results from U.S. anthropogenic emissions, as compared to other sources of Hg."[26]

To date, the agency has not provided any demonstrable evidence in the rulemaking record to show that anyone in the country has suffered adverse health problems as a result of mercury emissions from coal-fired EGUs. Rather, EPA is asking the public to accept a higher cost of electricity and job losses based on an attenuated line of reasoning—EGUs emit mercury; some of that mercury is bound to deposit on the land or in water bodies; some of that deposited mercury in the waterbodies can possibly be transformed into MeHg; and some of the MeHg produced in the sediments of those waterbodies is consumed by fish where it

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[23] Technical Support Document: National-Scale Mercury TSD Supporting the Appropriate and Necessary Finding for Coal- and Oil-Fired Electric Generating Units, EPA-452/D-11-002, Mar. 2011 ("Mercury TSD"). NMA adopts and incorporates by reference UARG's comments and critique of EPA's Mercury TSD.

[24] 76 Fed. Reg. at 24983 (emphasis added).

[25] EPA dismisses the need to reconcile these dissimilar positions explaining that "it is not necessary to quantify the amount of mercury in fish due to electric utility steam generating unit emissions relative to other sources for purposes of this finding." 65 Fed. Reg. at 79827; *see also* 76 Fed. Reg. at 24996 (noting that "[n]owhere in section 112(n)(1) or in its direction concerning the NAS study did Congress require EPA to quantify the amount of MeHg in fish tissue that was directly attributable to EGUs."). NMA disagrees with this conclusion.

[26] 76 Fed. Reg. at 24983; *see also* RIA § 5.1 at 5-1 (stating "…for commercially purchased ocean fish, it is nearly impossible to determine the source of the methylmercury in those fish…").

ultimately enters the food chain.[27] In fact, valid, peer-reviewed scientific research concluded that the level of MeHg in the world's oceans *is not controlled* by deposition of atmospheric mercury to the oceans of the world.[28] Thus, regardless of the stringency of the mercury controls required of coal-fired EGUs, the levels of MeHg in ocean fish will not be influenced by this proposed rule.

Like the 2000 determination, the primary driver in EPA's decision to regulate mercury from EGUs is premised on the Mercury TSD's highly conservative reference dose-based hazard quotients ("HQs") for MeHg.[29] This measure compares the potential exposure of subsistence anglers fishing in a specific water body to the MeHg reference dose ("RfD"). UARG states in its comments that the scientific validity of EPA's methylmercury RfD is an important question because of its significance as the divisor in computing the HQ value.

EPA's RfD served as the lynchpin for two key agency "findings" to justify its 2000 determination—the existence of fish advisories in many states; and, the number of women of child bearing age who are predicted to have MeHg exposure above the RfD. By treating the RfD for MeHg in the December 2000 finding as an absolute threshold for health risk, EPA avoided having to demonstrate some discernable health risk to a segment of the population at some defined level of predicted exposure.[30]

A review of the rulemaking docket reveals that EPA's RfD is derived solely from the results of a study involving young children in the Faroe Islands. EPA chose to use the Faroe Islands study because it concluded that there were adverse developmental effects as a result of MeHg exposure. Sole reliance on the study is fundamentally flawed. First, the data underlying the analysis has never been made

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[27] *See* Dr. Soon Critique at 2 (affirming this sentiment by stating, "the EPA proposal neglects key scientific knowledge and many peer-reviewed papers that suggest there is *no straightforward connection* between mercury (Hg) emissions from power plants or other man-made sources to the mercury level in fish").

[28] *See Environmental Science & Technology*, based on *Citation Abstracts*, *see* "Sources and Variations of Mercury in Tuna," Kraepiel, A.M.L.; Keller, K.; Chin, H.B.; Malcolm, E.G.; Morel, F.M.M.; *Environmental Science Technology*; 2003; 37(24); 5551-5558 (DOI: 10.1021/es0340679); *see also* "Response to Comment on Sources and Variations of Mercury in Tuna" Kraepiel, A.M.L., Keller, K; Chin, H.B.; Malcolm, E.G.; Morel, F.M.M.; *Environmental Science Technology*; 2004; 38(14); 4048-4048 (DOI: 10.1021/es0404217).

[29] Mercury TSD at 50.

[30] *See id.* (noting that EPA's mercury RfD "safe" dose of 5.8 ppb when measured in human blood is equivalent to an intake of 0.1 (micrograms/kg/day) or about 1.0 ppm when measured in human hair. For context, EPA's mercury reference dose of 0.1 (micrograms/kg/day) is a factor of 2 to 4 more stringent than other estimates from human health organizations. The FDA dose was established at 0.4, the Agency for Toxic Substances and Disease Registry (ATSDR) at 0.3, and the newly revised World Health Organization level at 0.21). *Thus, making EPA's the most stringent in the world.*

available for public inspection—raising doubts as to whether EPA has adhered to Executive Order 13563 and the Information Quality Act.[31] Second, the Electric Power Research Institute ("EPRI") pointed out that the polychlorinated biphenyl ("PCB") and lead exposures of pregnant women in the Faroe Islands are among the highest ever measured in humans—not representative of the United States.[32] Moreover, the Faroe Islands study got its MeHg dosage through consumption of highly contaminated pilot whale meats and blubbers, as admitted by Dr. Pal Weihe, Chief Physician of the Department of Occupational and Public Health of the Faroese Hospital System.[33] EPA ignored these critical facts in relying on this study.

By contrast, EPA largely ignored the results of the Seychelles Islands study.[34] The Seychelles study could not confirm any harmful effects on children through MeHg exposure from eating a variety of ocean-caught fish, especially at levels that are more representative for American public health. Furthermore, the underlying data for this study has been made available to other independent scientists. By solely relying on the Faroe Islands study, EPA's RfD for MeHg exposure is excessively exaggerated by at least a factor of 10 or more.

EPA also cites the existence of fish advisories to demonstrate that mercury poses a human health concern. These advisories are tied to the RfD set for a given compound. Accordingly, states that rely on EPA's much higher RfD for mercury will inevitably record a higher number of fish advisories. Fish advisories do not distinguish among the sources of the mercury entering the waterbody at issue or how much of the mercury came from historical sources. Moreover, the primary purpose for fish advisories is to warn the public about undue consumption of fish from a particular source to avoid health issues. Simply put, the number of fish advisories does not support a legal conclusion that mercury emissions from coal-fired EGUs pose risks to public health.[35]

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[31] 44 U.S.C. § 3516.

[32] Comments of EPRI Re: RfD for Methylmercury, at 7-8 (Nov. 28, 2008).

[33] Dr. Soon Critique at 4.

[34] As noted in UARG's June 29, 2004 comments, Docket ID No. OAR-2002-0056, EPA's elevation of the Faroe Islands study over the Seychelles Island may, in part, have resulted from recommendations in the 2000 report of the National Research Council ("NRC"), entitled *Toxicological Effects of Methylmercury*. That report found that there were no serious flaws in the MeHg studies conducted in the Seychelles and Faroe Islands. The panel recommended the use of the Faroe Islands study in deriving an RfD because it resulted in the finding of a positive relationship between MeHg exposure and poor neurodevelopmental outcomes while the Seychelles study did not. *See* IRIS Database, Methylmercury, § I.A.2, at 4-5 (2001). EPA's reliance on the NRC report is misplaced because the panel's conclusion is, at bottom, a policy judgment and not a reflection of the science. Thus, the NRC strayed beyond its initial charge. EPA needs to make its own policy judgment in setting the RfD.

[35] *See* UARG's comments at 54 (stating that Tetra Tech showed that a 99th percentile waterway would result in an HQ of 0.67—a level *that is protective of human health without any further mercury reductions from EGUs*).

EPA also ignores the fact that over 75 percent of the mercury that deposits in the U.S. comes from sources outside the country.[36] Once mercury is released, it accumulates in the atmosphere resulting in deposition long distances from the actual source exacerbating the lack of causal relationship between the need for regulation and the risk posed by mercury emissions from EGUs. EPRI has documented in recent studies the critical role that intercontinental mercury transport from Asia and other nations play in determining U.S. mercury deposition.

> Direct measurements have revealed significant levels of mercury exiting mainland Asia and crossing the Pacific to the U.S. In 2001 and 2002, EPRI, in cooperation with the National Center for Atmospheric Research, the National Aeronautics and Space Administration, the National Oceanographic and Atmospheric Administration, and other agencies used aircrafts to measure mercury in air plumes exiting China near the city of Shanghai, following them over the Pacific for 400 miles. A later set of flights over the Pacific between southern California and Oregon found evidence of the same plume crossing the California coast.[37]

Because mercury is emitted and transported globally, reductions of U.S. mercury emissions from EGUs would have a negligible impact on mercury deposition in the United States. For all of these reasons, the factual record does not support a finding that mercury emissions from EGUs pose a meaningful health risk. It is therefore not "appropriate" to regulate EGU mercury emissions under section 112(n)(1)(A).

2. <u>EPA has never provided an initial finding of public health concern to regulate non-mercury HAPs under section 112(n)(1)(A)</u>

Nowhere in the RIA does EPA even attempt to *quantify any direct benefits associated with* the regulation of acid gases, or the metallic or organic HAPs reductions. Interestingly, of the 469 pages of the RIA only 6.5 are dedicated to discussing the risks posed by non-mercury HAPs.[38]

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[36] EPA uses the CMAQ model in the Mercury TSD to predict mercury deposition from EGUs. UARG outlines in its comments the serious limitations of this model when applied to small areas of localized deposition (citing to EPRI Comments, § 3.2). The manner in which EPA choose to use the CMAQ model in the Mercury TSD overstates the mercury deposition attributable to EGUs.

[37] "Research Shows Most Mercury Deposited in U.S. Originates Outside the Country," EPRI Journal Online, Dec. 22, 2003.

[38] NMA adopts and incorporates by reference UARG's criticism of EPA's decision to regulate trace metals based on a single case study of the inhalation risk from 15 coal-fired facilities. *See* 76 Fed. Reg. 25,013; Strum, Thurman, and Morris, "Non-Hg Case Study Chronic Inhalation Risk Assessment for the Utility MACT Appropriate and Necessary Analysis" (Mar. 16, 2011) ("16-Unit Study"). Specifically, UARG states that EPA's 2010 estimate of coal usage was overstated and its prediction about the amount of pollution control equipment was grossly

As with the lack of health benefits derived from mercury control, it is also unsurprising that no incremental health benefits accrue from regulating non-mercury HAPs. Even in 2000, the agency concluded that the existing evidence did not demonstrate that public health concerns exist from the other HAPs. The 2000 determination stated, "arsenic and a few other metals (*e.g.*, chromium, nickel, cadmium) are *of potential concern* for carcinogenic effects and that dioxins, hydrogen chloride, and hydrogen fluoride are of *potential concern*."[39] The agency goes on the further note, "[t]he other HAP[s] studied in the risk assessment do not appear to be a *concern for public health based on available information*."[40]

EPA likewise did not alter this conclusion in its 2005 Revision. In fact, the agency in 2005 bolstered the notion that it lacked the information necessary to make this determination. "Based on the information before it at the time [of the 2000 determination], EPA could not have *reasonably concluded that coal-fired Utility Unit non-mercury HAP emissions presented a hazard to public health*."[41]

EPA has no better evidence now than it had in 2000. For example, none of the acid gases are listed as carcinogenic, which is important as EPA rests its decision to regulate acid gases based on EGU emissions of HCl. In its inhalation risk analysis, EPA estimated HQ for HAPs that pose non-cancer health risks from chronic exposure. If an HQ is 1.0, EPA states that estimated exposures are at a level that is likely to be without an appreciable risk of deleterious effects during a lifetime, but above that point, EPA considers the margin of safety against toxic effects to be too uncertain to regulate.

EPA reports that the HQ for HCl never exceeded 0.05 in any of its risk inhalation estimates,[42] meaning that for EGUs, the predominant HAP in the acid gas group has a maximum risk that is only *5 percent* of the level that is considered protective of health with a safety factor included. Thus, the agency itself concludes

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understated. EPA needs to square its perception with reality. Indeed, EPRI modeling of every coal-fired EGU demonstrated that the inhalation risk for every facility was below one-in-one million for carcinogens and a hazard index of 1 for chronic (long-term) and acute (short-term) exposures to non-carcinogen HAPs.

[39] 65 Fed. Reg. at 79,380. In the 2005 Revision, EPA acknowledged that § 112(n)(1)(A) only allows EPA to regulate if the agency identifies a human health concern. A finding that a HAP may pose an environmental concern is inappropriate for regulation under § 112(n)(1)(A).

[40] *Id.*

[41] 70 Fed. Reg. at 16,006 (emphasis added).

[42] *See* 76 Fed. Reg. at 25,051 n. 170. Although EPA notes that other acid gases (Cl2, HF and HCN) were not included in the risk calculation "because of uncertainties in their emissions rates," it is hardly likely that any of these other gases would involve an HQ so much closer to 1.0 than HCl, especially given that their total EGU emissions are less than 15 percent of total EGU HCl emissions.

that HCl emissions pose no significant potential for exceeding the chronic RfC value.[43]

Moreover, EPA does not provide any evidence that more stringent control of acid gases would benefit ecosystems other than some vague referencing of the possibility.

> In areas where the deposition of acids derived from emissions of sulfur and NOx are causing aquatic and/or terrestrial acidification, with accompanying ecological impacts, the deposition of hydrochloric acid *could* exacerbate these impacts. Recent research *has suggested* that deposition of airborn HCl has a greater impact on ecosystem than previously thought, although *direct quantification of these impacts remains an uncertain process*.[44]

In fact, HCl is a very minor contributor (about 1percent) of all acidification to water bodies—making EPA's need for regulating appear rather insignificant. EPA simply has not provided an adequate basis to regulate acid gases from EGUs.

3. <u>The entire rulemaking is predicated upon questionable health benefits from an already regulated pollutant</u>

Virtually all of EPA's claimed benefits are derived from the incidental collateral reduction of SO2 emissions that will occur as a "co-benefit" of reducing acid gas emissions. To date, EPA has not been able to document any evidence of acute or chronic health risk from exposure to the minuscule amounts of amounts of acid gases emitted by EGUs. In other words, EPA appears to be regulating EGU acid gas emissions under section 112(n) not because such emissions represent a health risk—they do not—but because EPA wants to regulate SO2, which is not a HAP. This is clearly a misuse of the agency's authority under section 112(n).

EPA concludes that the control technology utilities will install to control acid gas emissions will also control SO2 emissions, that reducing SO2 emissions will reduce atmospheric concentrations of fine particles, termed PM2.5, and that reducing atmospheric concentrations of PM2.5 will save lives and improve health. Indeed page one of the RIA states, "[t]*he great majority of the estimates [health] are attributable to co-benefits from reductions in $PM_{2.5}$-related mortality*." This is based largely on the assertion that the proposed rule will avoid 6,800-17,000 premature deaths per year from PM2.5 exposure.

But, PM2.5 is already comprehensively regulated under other CAA programs, in particular the NAAQS program, with EPA having set the NAAQS for that pollutant. EPA, sources, and states under the NAAQS program are required to undertake a

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[43] 76 Fed. Reg. at 25,051.

[44] 76 Fed. Reg. at 25,050 (emphasis added).

series of actions to ensure that atmospheric PM2.5 concentrations do not exceed the standard. Thus, any "co-benefits" the rule might achieve in reducing concentrations of PM2.5 are duplicative of what other regulations will achieve.

Even more telling is the fact that almost the entire alleged PM2.5 benefits ($52 to 139.4 billion) stem from exposures that are occurring at levels below the NAAQS. But EPA is required to set the NAAQS at levels protective of human health with an "adequate margin of safety."[45] Thus, despite EPA's claim that the proposed rule will produce large benefits, the fact that the agency set the NAAQS at 15 $\mu g/m^3$ means that, in reality, even the agency does not believe the proposed rule will produce benefits anywhere close to those projected in the RIA.

The agency is preparing to propose a new PM2.5 NAAQS, and that proposed standard may be lower than the current NAAQS. Until it does so, however, it is inappropriate for EPA to adopt rules based on claimed benefits below the current NAAQS level. Until changed, the 15 $\mu g/m^3$ NAAQS represents EPA's judgment of the standard necessary to protect human health with a margin of safety. In any event, the lowest standard contemplated by EPA is 11$\mu g/m^3$. Even at this level, Figure 6-15 of the RIA demonstrates that *80 percent* of the asserted benefits would still be occurring at levels below the NAAQS.

Yet EPA goes even further. In 2009, EPA made a significant change in how it estimates deaths from PM2.5 exposure that substantially puffs up its benefits analysis. EPA started to count mortality estimates for PM2.5 exposures below the lowest measured level ("LML") in any of the statistical studies on which EPA relies. Although EPA has never set a NAAQS at a level as low as the LML, because the agency has never believed that protecting public health required such a standard, measuring benefits below that level lacks any basis in reality. Worse still, EPA assumes that there is no tapering off of mortality as PM2.5 exposures approach zero, as if the same risk exists at very low concentrations of PM2.5 as it does at high concentrations.

This seemingly innocuous change made in 2009 had the huge impact of assuming that people were being killed by PM2.5 exposures in the vast swath of the United States where PM2.5 levels are less than 10 $\mu g/m^3$. Whereas these areas used to contribute nothing to estimates of PM2.5 mortality, under EPA's new approach, they contribute *fully 70 percent* of the mortality in EPA's upper-end estimate.

EPA's drastic damage estimates are facially absurd. Figure C-2 from Appendix C of the RIA shows the percentage of total U.S. deaths that EPA believes

[45] *See* RIA at Figure 6-15 (demonstrating that almost all of the $53-140 billion in PM2.5 co-benefits are due to reductions in exposures to PM2.5 already below the level of the current 15 $\mu g/m^3$ NAAQS). Figure 6.5 shows health impacts occurring under the annual PM2.5 standard. EPA also has a daily PM2.5 standard, which the RIA does not display similar information.

are caused by PM2.5 exposure. However, EPA's figure only shows the lower-end of the agency's estimated range, perhaps because revealing the upper-end would conceivably demonstrate how incredibly faulty the agency's estimates are. Using EPA's upper-end estimates, in the areas of the country with the highest PM2.5 concentrations, *15-23 percent* of all deaths are presumed to be caused by PM2.5 exposures! 13 percent of all deaths in almost all of the eastern U.S. are attributable to PM2.5 exposures! Yet according to CDC, only 20 percent of deaths annually are cause by tobacco.[46]

Indeed, the notion that PM2.5 exposures are killing people is itself a product of a string of uncertain conclusions based on a statistical analysis. There has never been a diagnosed death from PM2.5 exposure at ambient concentrations. The uncertainties include: (1) the statistical detectability of thresholds and other forms of non-linearity in true concentration-response relationships; (2) whether all particles are equally potent, which is critical because there vast differences in chemical composition of different forms of PM2.5; and (3) confounding and whether observed associations are due to some other cause.

In sum, the proposed rule does not produce any meaningful monetized benefits from reducing HAPs, which is what the rule ostensibly is supposed to do. And the supposedly tens and even hundreds of billions of annual benefits that the proposed rule will incidentally produce by lowering the atmospheric PM2.5 concentrations are so exaggerated as to be of no use in judging the wisdom of promulgating this rule. On the other hand, the $10.9 billion in compliance costs that EPA estimates, which are significantly understated, are real costs and will have real impacts on the electric consumers that will have to foot the bill. President Obama promised that his Administration will be diligent in eliminating unneeded regulation and regulatory overlap. The proposed rule is a perfect example of the type of duplicative and unnecessary regulation the President has promised not to adopt. Yet EPA does not seem to understand the import of the President's concern.

B. EPA Has Underestimated the Costs of this Rulemaking

EPA likewise errs in projecting the total cost of compliance. In order to soft-peddle the overall impacts to the economy, EPA relies on a series of unverified assumptions about the type, efficacy, and quantity of needed control technology. Chief among those speculative suppositions is EPA's belief that dry sorbent injection ("DSI") technology can effectively displace the need for 56 GW of the existing fleet to install costly scrubbers to meet the stringent acid gas emissions standards.[47] Should EPA's DSI projection not materialize to this anticipated degree, the units

[46] EPA's 2009 change in methodology accounts for some of this exaggeration. For instance, it changed the estimate of premature mortality among people exposed to at least 12 $\mu g/m^3$ from 3 percent of all deaths to 19 percent.

[47] RIA, "8.4 Projected Compliance Actions for Emissions Reductions," at 231.

that fall within the estimated 56 GW will either have to install scrubbers at over ten times the capital cost or retire. Either option will greatly increase the cost to comply with the proposed rule. Unfortunately, there is little data to support EPA's "bullish assumptions" regarding a technology not widely tested or used by EGUs for this purpose.[48]

1. EPA must produce a cumulative cost analysis of its regulatory program affecting the use of coal

NMA and now many other voices have repeatedly requested EPA perform an assessment of the cumulative costs associated with its now-numerous completed, pending and expected rulemakings that are intended to, and will, have the effect of substantially reducing the usage of coal as an electric power and industrial boiler fuel in the United States.[49] As this rulemaking is part-and-parcel of EPA's overall regulatory program to develop, in its words, a "clean, efficient, and completely modern power sector," the agency must assess the costs and benefits of all of its current and expected power sector regulations affecting coal-fired EGUs.

To date, EPA has provided no indication it will seriously entertain this important request. Consequently, Congress is now considering potential legislation to require such an assessment. EPA should not have to be compelled through legislation to act on this repeated request. A cumulative cost assessment is logical and would help the public and regulated entities understand the risks and rewards of EPA's power sector regulatory program.

Analyzing the cumulative impacts associated with these integrated rulemakings is not only good public policy, it is also required by Executive Order 12866 and the notice and comment rulemaking provisions of the CAA. The import of this executive order to, "tak[e] into account, among other things, and to the extent practicable, the costs of cumulative regulations," was recently reiterated in President Obama's Executive Order 135653 to improve regulations and regulatory review.

EPA seems to recognize the interrelated nature of its rulemakings on the power sector. In the preamble, the agency states that:

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[48] Nelson, Gabriel, "Air Pollution: Fate of Old Coal Plants May Hinge on New Toxic-Cutting Technology," *Greenwire*, Apr. 13, 2011. Available at: http://www.eenews.net/public/Greenwire/2011/04/13/2

[49] *See* NMA's Comments on the Industrial Boiler MACT rule, Docket Nos. EPA-HQ-OAR-2002-0058 and EPA-HQ-OAR-2006-0790 (Attachment 5), where the association proposed a reasonable approach for completing such an assessment. To date, EPA or the Administration has done nothing in response to NMA's continued inquiries. To complete the record here, NMA is submitting its comments on cumulative impact assessment from the Industrial Boiler MACT and CSAPR (Attachment 6) rulemaking dockets here.

> EGUs are the subject of several rulemaking efforts that are either are or will soon be underway. In addition to this rulemaking proposal, concerning both hazardous air pollutants under section 112 and criteria pollutant NSPS standards under section 111, EGUs are the subject of other rulemakings, including ones under section 110(a)(2)(D) addressing the interstate transport of emissions contributing to ozone and PM air quality problems, coal combustion wastes, and the implementation of section 316(b) of the Clean Water Act (CWA). They will also soon be the subject of a rulemaking under CAA section 111 concerning emissions of greenhouse gases. EPA recognizes that it is important that each and all of these efforts achieve their intended environmental objectives in a common-sense manner that allows the industry to comply with its obligations under these rules as efficiently as possible and to do so by making coordinated investment decisions and, to the greatest extent possible, by adopting integrated compliance strategies.
>
> In addition, EO 13563 states that "[i]n developing regulatory actions and identifying appropriate approaches, each agency shall attempt to promote such coordination, simplification, and harmonization. Each agency shall also seek to identify, as appropriate, means to achieve regulatory goals that are designed to promote innovation." Thus, EPA recognizes that it needs to approach these rulemakings, to the extent that its legal obligations permit, in ways that allow the industry to make practical investment decisions that minimize costs in complying with all of the final rules, while still achieving the fundamentally important environmental and public health benefits that the rulemakings must achieve.[50]

Unfortunately, despite recognizing the fact that utilities need to adopt an integrated strategy for addressing *all* of EPA's rules, and even with the very near-term compliance deadlines in at least CSAPR and the instant rulemaking, EPA states that it will not begin to consider coordinated control strategies until the New Source Performance Standard ("NSPS") for greenhouse gas emissions rulemaking. At that time, EPA says it will "facilitate the industry's undertaking integrated compliance strategies in meeting the requirements of these rulemakings."[51] While NMA is mindful of EPA's recognition that the power sector needs to have the full benefit of understanding all of the relevant regulations before determining a compliance plan, EPA's undertaking to address coordinated strategies at the NSPS rulemaking stage is too little, too late. Eastern utilities must begin to complying with CSAPR in January. When EPA finalizes the instant rule in November, utilities will have only three years to comply. It would have been far better had EPA undertaken the

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50 76 Fed. Reg. at 25,057.

51 *Id.*

process it now plans when it initiated its first rulemaking impacting the power sector.

The agency's planned process also does not go far enough. EPA has an obligation not just to help the regulated community plan for all of these interrelated regulations; it must also cumulatively assess the societal impacts of these regulations. A key purpose of Executive Order 12866 and 13563 is to inform the public of the costs and benefits of regulation, including on a cumulative basis. Notwithstanding the statements of integrated planning in the proposed rule, it does not appear that EPA intends to provide such an analysis. It should.

Taken together, this regulatory program will undoubtedly produce a dramatic and cascading series of impacts not only within the coal industry but across the entire economy. There will be direct effects on coal employment and indirect effects on employment generally in the economy as a result of higher energy prices. Higher energy prices will also affect GDP and economic activity generally. American competitiveness will also be affected, as higher prices undermine the ability of American businesses to compete, with resulting offshoring of American business and jobs. The public has a right to fully understand these impacts.

2. EPA's DSI assumption is misguided

The implications of the DSI issue cannot be overstated. For such a crucial piece of the compliance puzzle there is a paucity of evidence demonstrating that an actual unit can comply with *all* of the proposed NESHAPs using DSI without a scrubber. NMA's review of the rulemaking docket reveals only two source materials attempting to support EPA's DSI theory. Based on the first source, EPA claims that "HCl removal effect is assumed to be 90% based on information from Solvay Chemicals."[52] The only support for this conclusory statement is a reference to a 12-page slide presentation; hardly persuasive in light of the import the agency places on this assumption. Moreover, this presentation was predicated on sodium bicarbonate injection—not Trona—therefore, the agency's predicted feed rates are inaccurate.

Second, the agency relies on "assessments" between engineering staff and the consulting firm of Sargent & Lundy. These "assessments" only contain a general statement that "demonstrations and recent utility testing have shown SO_2 removals greater than 80% for systems using sodium based sorbents." Importantly, the report does not analyze the technology for its proposed application—namely, compliance with the full suite of NESHAPs and the impact the technology may have on particulate matter and mercury emissions.

[52] "Documentation Supplement for EPA Base Case v4.10_PTox: Updates for Proposed Toxics Rule," EPA, March 2011 ("IPM Supplement"), at 92. The other source is the so-called "assessments" by EPA engineering staff in consultation with Sargent & Lundy.

None of the numerous recent reports regarding the impact of CAA regulations on EGUs considered DSI a viable acid gas control option without a scrubber.[53] The U.S. Energy Information Administration ("EIA") in its 2011 Annual Energy Outlook likewise doubts EPA's DSI assumption noting that, "other analyses are not as optimistic on the prospect of DSI," leading the agency to conclude that scrubbers will be needed to comply with the proposed rule. Yet EPA does not seem inclined to engage in a realistic analysis of the issue.

There are at least three primary reasons for the lack of enthusiasm around the efficacy of the DSI technology. First, there is limited industry experience employing the technology to control acid gases without a scrubber. The ICR data base indicates that there are only 28 units or 9 GWs of DSI capacity in the Base Case of the model primarily to deal with SO_3 reduction—only eleven are used for SO2 control. According to our review of the information, among the top 12 percent of the units that set the MACT floor for acid gases, only 15 use DSI technology. Of those 15 units, only 5 use DSI without a scrubber and only one of those units burns bituminous coal.[54]

It is also difficult to precisely calibrate the overall effectiveness of DSI because the EPA database is missing fuel chlorine data for at least eight of the listed DSI-only units. Removing these units from the evaluation, leaves only 2 units from the smaller group of eleven—those with proper emissions data—using DSI without a scrubber, but both of these units are burning low chlorine content coal. Thus, it is impossible to discern whether any actual unit can effectively and consistently meet the proposed acid gas standards as a direct result of having employed DSI technology.

NMA finds it difficult to believe a utility would consider investing in a technology with such limited industry testing and experience, high variable costs and other ancillary issues including negative impacts on ash impoundments and potential leaching. The agency's aggressive rulemaking schedule makes it challenging for a utility to obtain the essential on-the-ground testing information to validate performance and conduct necessary feasibility studies. Moreover, the lack of experience with the technology also highlights the problem with setting emissions standards pollutant-by-pollutant as there is also insufficient data to confirm whether a unit using DSI with or without a scrubber can meet all three standards on a continuous basis without creating antagonistic impacts to the overall effectiveness of other control technologies.

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[53] *See generally* Celebi, Metin, et al., "Potential Coal Plant Retirements Under Emerging Environmental Regulations," The Brattle Group, Dec. 8,, 2010; "2010 Special Reliability Assessment: Resource Adequacy Impacts of Potential U.S. Environmental Regulations," North American Electric Reliability Corporation (NERC), Oct. 2010; and Eggers, Dan, et al., "Growth From Subtraction," Credit Suisse, Sept. 23, 2010).

[54] *See also* Salisbury, Benjamin, et al., "Coal Retirements—25 GW to 50 GW Remain at Risk," FBR Capital Markets, March 25, 2011.

EPA is also making this DSI prediction in a regulatory vacuum. Many of the units within the scope of the 56 GW will not have the option to choose this compliance route because overlapping CAA rules will render that decision moot. The recently finalized CSAPR is designed to reduce the interstate transport of SO2 and NOx from EGUs in 27 eastern states. Importantly, 464 of the 521 units without scrubbers are located within the geographic reach of CSAPR. Even though a modest trading program is part of the regulation, a significant portion of these units will need to install scrubbing technology to comply with the rule beginning in 2012.

The issue of overlapping technology demands is not directly addressed in the RIA other than some vague referencing to integrated planning in the preamble after the proposed NSPS for GHGs from EGUs are issued. This lack of analysis further reinforces the need for a cumulative cost analysis by the agency. Neither a utility nor a public utility commission would permit the investment in DSI technology and sorbent storage facilities only to have to install a scrubber two years down the road. EPA must examine what portion of the estimated 56 GW will actually choose DSI given EPA's other regulations in order to provide a realistic estimate of the costs of this rule.

Third, not every coal type within the projected 56 GW will be able to meet the stringent acid gas standard using only DSI. The DSI consultant EPA relies on, Sargent & Lundy, states that "[t]he DSI technology should *not be applied to fuels with a sulfur content of greater than 2 lb SO_2/MMBtu*."[55] This statement buttresses the conclusion advanced by the above paragraph—which is, DSI is rarely employed without a scrubber and is almost never used with units burning coal with high sulfur content.

Despite the consultant's assessment, EPA projects the exact opposite stating "[m]any available pollution controls achieve emissions removal rates up to 99 percent (e.g. HCl removal by new scrubbers), which allows industry to rely more heavily on local bituminous coal in the eastern and central parts of the country that has higher contents of HCl and sulfur, and is less expensive to transport than western bituminous coal."[56] Part of this oversight is attributed to the various assumptions and biases built into the Integrated Planning Model that result in biased low projections of compliance costs. The model is designed to determine the most cost effective means of meeting electric generation capacity requirements given certain constraints. Thus, the model permits a unit to both select the lower-cost DSI technology and take advantage of lower cost local bituminous coals. This is not a realistic choice for a utility. EPA needs to reexamine the interplay between the use of DSI without a scrubber using local bituminous coal in order to provide an accurate assessment of the compliance costs.

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55 IPM Supplement, Appendix 5-4, at 2.

56 RIA at 237.

Clearly, without a realistic assessment of the market penetration for DSI, EPA cannot provide a reasonable cost estimate of the proposed rule. NMA projects that based on a more grounded assessment of DSI, the cost of complying with just the acid gas standard could be *over three times EPA's projection, totaling almost $12 billion/year* casting further doubt on EPA's overall projection of $10.9 billion per year for the entire proposed rule.[57]

Table 1
Coal-Fired EGUs with Scrubbers

Type of Scrubber	No. of Units	Capacity (MW)
Wet	272	126,907
Dry	83	20,068
Unspecified	94	39,516
TOTAL Scrubbers	**449**	**186,491**

Fluidized Bed Combustion	70	7,905
No Scrubber	521	119,606
TOTAL EGUs	**1,040**	**314,003**

Source: NEEDs Version 4.10 PTox Database

[57] For purposes of this projection, NMA revised EPA's cost estimates with a more realistic assessment of the market penetration for DSI. We assumed an additional 119 MW of scrubber installations, thus Tables 1 and 2 reflect the cost of acid gas compliance for the 521 units without scrubbers. ***Methodology:*** As a preliminary matter, it is not clear what EPA's total projected compliance costs are. EPA claims that it uses an 11.3 percent capital charge rate, or roughly a nine year payback period for economic analyses in the model ("Documentation for EPA Base Case v4.10 Using the Integrated Planning Model," at 8-14). The Agency also refers to a 20-year depreciation schedule for environmental retrofits (IPM Background Document at 8-11). Based on our calculations, it appears that EPA has multiplied total compliance cost estimates by 11.3 percent to arrive at annual costs. So, for example, an annual capital cost of $1,421 million/year for "Dry FGD and Fabric Filters" corresponds to a total cost (excluding consideration of the time value of money) of $12,565 million, spread over an approximately nine year period. We will apply the 11.3 percent capital charge rate to our total cost estimates to compare them with EPA's annual projections.

For calculating scrubber capital and fixed operating and maintenance ("FOM") costs, NMA used Table 5-4 of the IPM Background Document, along with heat rate and capacity information from the NEEDs database, for the 521 units that do not have a scrubber. Based on the primary fuel listed in the NEEDs database, we assume units burning bituminous coal would install wet FGD systems and those burning subbituminous or bituminous/subbituminous blends would install dry FGD systems. Of those 521 units, 439 do not have fabric filters. For calculating fabric filter capital and FOM costs, we used Table 5-24 of the IPM Background Document, along with the NEEDs database. For variable operating and maintenance (VOM) costs, which are based on kilowatt hour (kWh) assumptions, NMA used the ratio of EPA's variable to fixed O&M cost projections.

Table 2
Projected Retrofit Costs
to Comply with Proposed Acid Gas Standards
(Annual Costs, Million $)

Cost Component	Commenter's Costs (FGD + FF)			EPA's Costs[1] (DSI or Dry FGD + FF)
	Scrubbers	Fabric Filters	TOTAL	
Capital Cost	$ 6,579	$ 1,908	$ 8,487	$ 1,849
FOM	1,250	71	1,321	323
VOM	1,875	106	1,981	1,618
TOTAL	**$ 9,704**	**$ 2,085**	**$11,789**	**$ 3,790**

[1] Source: 76 FR 25,075 (May 3, 2011).

EPA needs to reexamine this critical assumption with actual on-the-ground testing to determine if both the efficacy and unwanted environmental side effects of DSI makes it a viable control technology.

3. Many analysts have predicted higher amounts of early coal retirements

EPA's claim of "common-sense" rulemaking is, in large part, intertwined with its DSI assumption. If EPA's unsupported assumption as to the number of units that can install DSI as a compliance strategy is wrong, the costs of complying with the acid gas standard could potentially triple, as many more units will have to install or upgrade costly scrubbing technology. This increased cost will correspondingly result in more retirements and higher electricity prices as many units will not be able to absorb the additional cost. This fact invites legitimate criticism of the agency's 10 GW retirement figure. For example, and in addition to the below chart,[58] FBR Capital Markets states that "…the practical applicability of DSI remains a debatable point due to the additional ash produced, reliability of the reagent supply chain, lack of utility sector experience with this technology, and the potential impact of dispatch. More limited adoption of this technology *could lift the retirement number above 50 GW.*"[59]

[58] It is important to note that each projection employed a different set of assumptions to arrive at the retirement projection—i.e. some studies analyzed the proposed rule in isolation, while others like NERA analyzed the instant rule in conjunction with other related CAA rules. The chart highlights EPA's glaring need to provide a cumulative cost estimate of all of these rules.

[59] FBR Capital Markets, Mar. 25, 2011; *see also* Dan Eggers, "Implications of EPA Policy," Credit Suisse, April 26, 2011(estimating that retirements could be as high as 100 GW) (emphasis added).

Table 3
Summary of Coal-Fired Retirement Projections[60]

Analyst	Date of Publication	Retirement Projection (GW)
U.S. Energy Information Administration (EIA)	April 2011	45-73
NERA Economic Consulting	May 2011	48
FBR Capital Markets	March 2011	35-45
McIlvaine Company	March 2011	31-68
Edison Electric Institute (EEI)	January 2011	50
The Brattle Group	November 2010	50-66
North American Electric Reliability Corporation (NERC)	October 2010	33 -77
ICF International	October 2010	75
Credit Suisse	September 2010	69

Even using EPA's own data it is entirely plausible that 50 GW will be forced to retire based on this suite of rules. The agency's 9.9 GW retirement figure is based on forecasting the Utility MACT rule in isolation, rather than examining the agency's own base case of 25 GW gross retirements. EPA's base case estimates 299 GW of coal generation in 2015, which is an 18 GW decline in coal capacity from 2010 based on the implementation of CSAPR and Utility MACT. The base case also assumes, albeit optimistically given the inability to construct new coal plants with the stringent new source standards, an additional 7 GW in coal additions during this time.

However, this entire projection is built upon full market penetration of DSI or 56 GW. Even assuming optimistically that the deployment of DSI is even half the forecasted rate, which is reasonable given that half of the units targeted for DSI deployment operate without scrubbers and burn medium or high sulfur coal, the retirement number could easily jump to 50 GW. Nowhere in the record does EPA engage in this sort of analytical rigor. Rather, the agency simply assumes the best without any factual support resulting in a flawed rule with an inaccurate assessment of the true impacts.

4. <u>EPA's mistaken beliefs about the current fleet will also increase the amount of projected retirements</u>

The issue of flawed retirement projections is not confined to the DSI assumption. Another aspect of this issue stems from Administrator Jackson's faulty statements regarding the state of the current fleet. In the proposed rule, EPA

[60] Each individual analysis is filed contemporaneously with these comments (Attachment 7).

notes that "[t]oday over 50 percent of the power generation fleet has scrubbing technology installed and the industry is already working on installations to bring that number to nearly two-thirds of the fleet by 2015."[61] This statement is seriously misguided and suggests that existing units with scrubbers will not have any compliance costs associated with this proposed rule. NMA seriously doubts EPA would be willing to offer this type of safe harbor treatment to existing coal-fired EGUs.[62]

This statement also does not seem to comport with other portions of the preamble where the agency predicts that "…the proposed rule will require companies to make a decision—control HAP emissions from virtually uncontrolled sources or retire these sometimes 60 year old units and shift their emphasis to more efficient, cleaner modern methods of generation, including modern coal-fired generation."[63] Notwithstanding this apparent contradiction, Administrator Jackson further reinforces this unsupported conclusion by noting one of the principal objectives of this rule:

> Utilities that have already put pollution control technology in place will no longer have to compete with those who have delayed those investments—a group that includes almost half the nation's coal-fired plants, which lacked advanced pollution control equipment. In fact, facilities that *have already taken responsible steps to reduce the release of toxins into our air will be at a competitive advantage over their heavy-polluting counterparts*. And to ensure cost-effectiveness, we have proposed flexibility in meeting the standards.[64]

These statements are fundamentally flawed. Over half of the scrubber in the referenced 50 percent of units will be at least 20 years old and at the end of their useful life by 2015. Thus, significant costs will be associated with upgrading existing scrubbers to achieve compliance with the proposed standards. Typical scrubber modifications to improve SO2 absorption include improving gas flow distribution, reconfiguring spray headers, adding frothing trays and increasing recycle flow. Furthermore, many existing scrubbers were built when the CAA only

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[61] 76 Fed. Reg. at 25,054.

[62] Furthermore, EPA should recognize that the MACT process sets the standard at the average of the top 12 percent, essentially at the 94th percentile, thus only 6 percent of units ostensibly should meet the standard without modification. Because about half of the units in the U.S. are unscrubbed, that 6 percent can only accommodate about 1/8th of the scrubbed units. That is, seven out of eight scrubbed units will have undertake some level of modification.

[63] 76 Fed. Reg. at 24,979.

[64] EPA Administrator Lisa P. Jackson, *Remarks on the Mercury and Air Toxics Standards Proposal, As Prepared*, Mar. 16, 2011, available at: http://yosemite.epa.gov/opa/admpress.nsf; *see also* 76 Fed. Reg. at 24,979.

required 70 percent SO2 removal. Based on this standard, scrubbers typically included partial FGD bypass and only modest SO2 removal in the absorber. Bringing these units up to the proposed emissions standards will likely require more than simply modifying spray headers and adding absorber trays. A more accurate analysis of this particular issue could *double* the projected upgrade costs for older units built before 1995 thereby increasing the number of retirements.

Utilities cannot make important investment decisions based on unverified assumptions and without considering the implications of the cost of recovery of these retrofits. Especially for older, less efficient plants the capital break-even point between installing, retiring or fuel switching when assessed in light of these multiple regulations makes it highly unlikely that EPA's view of the utility industry is accurate. This is evident in American Electric Power's assessment that these interrelated air rules will force the utility to prematurely shutter about 25 percent of its current coal-fueled generating capacity, or 6,000 megawatts.[65]

5. <u>EPA's assessment of impacts on electricity prices and job losses is premised on questionable assumptions and an inadequate rulemaking record</u>

Taken together, because EPA has missed the mark in projecting early retirements based on a series of questionable assumptions, the affordability and reliability of electricity will accordingly be uncertain. EPA attempts to blunt this criticism by claiming that "[t]he energy savings driven by these energy efficiency policies mean that consumers will pay less for electricity as well. EPA has modeled national average retail electricity prices, including the energy efficiency costs that are paid by the ratepayer. The Toxics Rule increases retail prices by 3.7 percent, 2.6 percent and 1.9 percent in 2015, 2020, and 2030 respectively relative to the base case."[66] This statement has limited heuristic value when factoring in the aforementioned assumptions coupled with the overreliance on modeling that fails to appropriately examine the issues on a regional basis, like the Midwest or Southeast where coal is the dominant fuel for electricity.

Part of EPA's problem in assessing the increase in electricity prices lies in the implicit biases of its model. The overriding principle of the model is to maintain adequate generating capacity and target reserve margins in each of the 32 modeling regions.[67] In order to maintain adequate resources in each region, the

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[65] Julie Johnson, "*AEP Says New Air Rules May Cost Up to $8 Billion, 600 Jobs*," June 9, 2011 available at: http://www.bloomberg.com/news/2011-06-09/aep-says-new-air-rules-may-cost-up-to-8-billion-600-jobs.html

[66] 76 Fed. Reg. at 25,056.

[67] Regulatory Impact Analysis at 8-17. *See also* ICF International's description of the IPM product, available at: http://www.icfi.com/insights/products-and-tools/ipm; and "Resource Adequacy and Reliability in the IPM projections for the Toxics Rule," available at: http://www.epa.gov/ttn/atw/utility/pro/resource_adequacy_rel.pdf.

model assumes that regions with excess supply will absorb the capacity lost by retirements. Stated differently, according to the model, retirement decisions are first a product of geography rather than on a realistic business decision. The following illustrates the problems with the model:

> The model projects retirements of three 750 MW units or 2,250 MW at the Navajo power plant in Arizona. The units were built in 1974-76 and have wet scrubbers operating at 92 percent efficiency. On the other hand, seven units in Northern Illinois totaling 2,017 MW built in 1952-59 without scrubbers, SCRs or fabric filters would continue to operate. The difference is the location. The AZNM modeling region has more excess capacity than the COMD region of northern Illinois. Unfortunately, the model may have placed too much faith in maintaining resource adequacy, particularly given the number of investor owned utilities. As a result, the projected number of retirements is unrealistically low. Alternatively, if the model's complete faith in resource adequacy proves correct, electricity costs will increase dramatically in certain regions such as the COMD modeling source.

EPA cannot wholly rely on this model to accurately analyze this important issue.

EPA also attempts to fall-back on early collaboration with key stakeholders to prevent the potential for skyrocketing electricity prices and job losses. The agency states that, "[i]n addition, EPA itself has already begun reaching out to key stakeholders including not only sources with direct compliance obligations, but also groups with responsibility to assure an affordable and reliable supply of electricity including state Public Utility Commissions (PUC), Regional Transmission Organizations (RTOs), the National Electric Reliability Council (NERC), the Federal Energy Regulatory Commission (FERC), and DOE."[68] EPA further states, "[i]t is EPA's understanding that FERC and DOE will work with entities to ensure an affordable, reliable supply of electricity…."[69] As mentioned in the Executive Summary, NMA can find no evidence of these consultations in the rulemaking docket.

More specifically, the public has no ability to discern whether EPA is presenting the implications of this rule with its overly optimistic DSI assumption thereby coloring the perceptions of the stakeholder.[70] Interestingly, as of October

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[68] 76 Fed. Reg. at 25,054.

[69] *Id.*

[70] The public will only be able to confirm if EPA includes all of the relevant documents regarding this particular issue. Moreover, the public is entitled to an opportunity to inspect these documents and provide comment.

2010, NERC as one of the identified stakeholders did not share EPA's view of *de minimus* impacts to electric power generating sector.

> Overlapping compliance schedules for the air and solid waste regulations, along with the required compliance for rule 316(b) following shortly thereafter, may trigger a large influx of environmental construction projects at the same time as new replacement generating capacity is needed. Such a large construction increase could cause potential bottlenecks and delays in engineering, permitting and construction. [71]

Based on this assessment, either NERC has changed its position since this time to align with EPA based on information not included in the rulemaking docket, or EPA is not being forthcoming about the reality of these "collaborations" to deal with this important issue. In any event, and unsurprisingly, the foregoing demonstrates that FERC—responsible for delivering reliable electricity to the country—is not as confident in EPA's assessment of the situation as EPA portrays it to be.

Following FERC's responses to Senator Murkowski, NMA joins the Senator's extreme concern with the impending situation, as described in her August 3 press release, "[h]aving received FERC's responses this week, I must say that I am now less confident [after initially hearing the Chairman's plans for an interagency task force] of that being the case." Preliminary review of FERC's responses completely validates her position.

In response to EPA's exaggerated representations in the preamble, Chairman Wellinghoff stated in his letter, "…this information assessment offered only *a preliminary look* at how coal-fired generating units could be impacted by EPA rules, and is *inadequate* to use as a basis for decision-making, given that it used information and assumptions that have changed." (emphasis added). This sentiment is further confirmed in Commissioner Moeller's response, "[a]ccording to OER staff, EPA's reliability analysis has been *limited*," and that staff have, "pointed out to EPA that a reliability analysis should explore transmission flows on the grid, reactive power deficiencies related to closures, loss of frequency response, black start capability, local area constraints, and transmission delivery." (emphasis added). In sum, EPA's "trust us" mentality has far underestimated the complexity underlying the delivery of affordable and reliable electricity.

This is further evidenced by the fact that neither FERC nor EPA has conducted a cumulative impacts analysis. Furthermore, FERC's assessment that 81 GW of "likely or very likely" retirements may result from the implementation of this suite of rules, further highlights the need—as expressed by NMA—for a more transparent and open process to deal with these important issues. Recognizing the Chairman's reservations about the results of this preliminary study, it nevertheless

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[71] NERC, *2010 Special Reliability Scenario Assessment: Resource Adequacy Impacts of Potential U.S. Environmental Regulations*, October 2010.

highlights EPA's failure to disclose this critical study and any other material that may exist regarding the EPA-FERC consultation process.

NMA joins Commissioner Moeller's recommendations to have FERC: (1) use its expertise to perform an analysis of EPA's rules that could impact reliability of electricity—and *disclose that analysis for public comment*—and then hold a technical conference for public input; and (2) have EPA extend the timing of these regulations as the agency's schedule "does not conform to the relevant planning horizons in the electric sector of our economy, one of the most capital-intensive sectors of industry."

Furthermore, the understatement of potential coal-fired EGU retirements and electricity prices will be especially acute if EPA holds the line with its new source emissions limits. As will be discussed below, the new source emissions standards based on the impermissible HAP-by-HAP approach makes it difficult to foresee investment in new coal. Credit Suisse projects that at a 60 GW retirement figure, there would need to be an additional 24 GW just to maintain reserve margins at 15 percent begging the important question of where will coal-dependent regions of the county replace these important sources of energy.[72] Despite EPA's effort to "level the playing field," the agency has done an inadequate job of informing the public as to the consequences of such a policy.

Unfortunately, where EPA's miscalculations will be most felt is the additional burden to rate paying customers. Public Utilities Commissions can hardly ask for the type of rate increase needed to offset these capital costs during times of economic prosperity let alone in the current economic condition. These consumer energy costs represent the most regressive *de facto* tax regimes as areas of the country reliant on coal-derived energy will rapidly become the most expensive. This is especially true for the "rust belt" region and states in the southeast that will be heavily impacted by EPA's faulty assumption that EGUs will shift to local bituminous coal based on DSI use, thus masking the overall jobs impact on these economically challenged areas.

In fact, the market—contrary to EPA's overly optimistic prediction—has already responded to the added pressure of these numerous CAA rulemakings. On May 26, 2011, Louisville Gas and Electric announced its plans to request a raise in residential electric bills by about 19 percent by 2016 in order to pay for upgrading its coal-fired power plants to meet rules promulgated pursuant to the CAA.[73] This dramatic increase is also reflected in the NERA study concluding that average electricity prices will increase by around 12 percent nationwide, with *regional*

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[72] Credit Suisse, April 26, 2011.

[73] Available at: http://www.courier-journal.com/article/20110525/BUSINESS/305250080/LG-E-seek-19-rate-increase.

increases as much as 24 percent.[74] If EPA is unwilling to modify the proposed rule and properly tailor its provisions to address environmental concerns and ensure reliable and affordable energy, the U.S. economy will undoubtedly suffer as a result.

Lastly, Administrator Jackson in her remarks at the signing ceremony for the proposed rule noted the uptick in so-called "green jobs" that would result from implementation of this rule. [75] While it may be true that some jobs will be created in order to install the requisite control technology, the overall economic impact of plants being forced to retire, no foreseeable construction of new coal-fired plants, the "multiplier" effect of job losses in sectors such as coal mining, and the expected increase in electricity prices of more costly energy sources cannot even begin to be offset by these so-called "government-created" jobs. The recent NERA study projects that the combination of CSAPR and the present rulemaking will result in nationwide *net employment losses totaling 1.44 million job-years by 2020*. These net losses take into account these "green jobs" as well as the jobs lost by these regulations. In other words, employment losses under only these two EPA regulations will outnumber gains by more than *four to one through 2020.*

David Montgomery of Charles River Associates, an economist with 40 years of work in energy and environmental policy recently testified before Congress and shed further light on the "green jobs" claim:

> The serious debate in environmental policy is about how the costs of new regulations compare to their benefits, and how to design the regulations to minimize costs, uncertainty and disruption. Claims that regulations that raise the cost of doing business will create new jobs are, *at best, a sideshow. Such claims only distract attention from the difficult tradeoffs that must be made between costs and benefits*. 'Green jobs' is not a subject that leading economists have usually taken seriously enough in professional journals.[76]

Based on the foregoing, it is difficult for EPA to legitimately claim that the proposed rule's benefits analysis is accurate.

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[74] "Proposed CATR + MACT," NERA Economic Consulting, Draft May 2011.

[75] EPA Administrator Lisa P. Jackson, *Remarks on the Mercury and Air Toxics Standards Proposal, As Prepared*, Mar. 16, 2011, available at: http://yosemite.epa.gov/opa/admpress.nsf

[76] Senate Committee on Environment and Public Works, Subcommittee on Green Jobs and the New Economy Hearing entitled, "Green Jobs and Trade," Feb. 15, 2011.

II. EPA'S RULEMAKING PROCESS IS LEGALLY DEFICIENT UNDER THE CLEAN AIR ACT

EPA has made it extremely difficult, indeed impossible, for the public to have a meaningful opportunity to provide comments on the proposed rule. EPA's haste in finalizing the proposed rule by November 2011 has resulted in insufficient time for comments, only ninety days despite the extraordinarily complex nature of the proposed rule. As the agency is fully aware, the proposal published in the *Federal Register* is 171 pages long and includes new MACT and new performance standard limits and compliance requirements for coal-fired EGUs as well as a new section 112(n)(1)(A) analysis. Moreover, there are over 19 technical support documents and a more than 500-page RIA in the rulemaking docket.

Furthermore, EPA has provided more time for public comment on other rulemakings that were both narrower in scope and less costly to the overall economy than the current proposal. For example, EPA augmented the original 60 day comment period for the Portland Cement MACT rule with an additional 60 days to ensure sound public participation on the 163 existing facilities (as compared to this rule's 1,200 existing units) at issue in the proposed rule.[77] While NMA is mindful of the 30-day extension, there is no reasonable explanation for why the agency insists on adhering to an unreasonable final deadline to deal with a rulemaking of this magnitude and significance. Given the agency's recent experience with the Industrial Boiler MACT consent decree and self-initiated reconsideration period, the agency should immediately recognize the undesirable results of a truncated rulemaking schedule.

The rushed schedule has already resulted in at least one significant error in setting the MACT standards. On May 5, 2011, UARG sent a letter to EPA identifying a critical conversion error that an NMA member company found in the agency's calculation of mercury emissions resulting in new and existing MACT floors that were 1000 times higher than the emissions identified in the dataset for those units. UARG requested the agency re-propose the rule to properly correct the mistake. EPA refused this request thereby failing to comport with the notice requirements of CAA § 307(d)(3).

Instead, EPA admitted the error and proposed to correct it by inserting the correction into a technical support document adding to an already cumbersome rulemaking docket. Rather than provide a Notice of Data Availability, the public is left to sift through the docket and discern whether to comment on the standard in the supplemental document or the one proposed in the *Federal Register*. Despite this and other important errors groups like UARG continue to discover with the proposed rule, EPA refuses to accommodate an adequate rulemaking period, undermining confidence that the agency is conducting an open and transparent rulemaking process consistent with the President's Executive Order.

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[77] 74 Fed. Reg. 21,136 (May 6, 2009).

Furthermore, the failure to provide evidence of the communication between FERC and other key stakeholders regarding the electric reliability issue is inexcusable. EPA cannot claim it has adhered to the statutory requirements of the CAA without installing all records related to these consultations and permitting the public an opportunity to meaningfully comment. More importantly, given FERC's reservations about EPA's portrayal of the situation, there is a glaring need for more serious collaboration on this issue with an opportunity for public participation. EPA must not sacrifice electric affordability and reliability at the feet of an arbitrary regulatory calendar.

These errors are directly at odds with the rulemaking requirements under section 307(d). Under paragraph (d)(3), a "notice of proposed rulemaking…shall be accompanied by a statement of its basis and purpose," and this statement "shall include a summary" of the "factual data on which the proposed rule is based;" and the "methodology used in obtaining the data and in analyzing the data." Lastly, paragraph (d)(3) instructs that "[a]ll data, information, and documents referred to in this paragraph shall be included in the docket on the date of publication of the proposed rule." EPA has not followed these statutory commands as the requirement to provide "all data" on which the proposal was based was not included in the preamble nor in the docket at the time the proposal was published in the *Federal Register*.[78]

The D.C. Circuit Court of Appeals has held that the public notice and comment requirements "are designed (1) to ensure that Agency regulations are tested via exposure to diverse public comments, (2) to ensure fairness to affected parties, (3) to give affected parties an opportunity to develop evidence in the record to support their objections to the rule and thereby enhance the quality of judicial review."[79] These objectives have been undermined in this rulemaking process. Moreover, there are indications in the preamble that regardless of the public input, EPA has a predetermined outcome in mind when it crafted these proposed regulations. The proposed rule states, "…EPA expects that sources will begin promptly, *based upon this proposed rule*, to evaluate, select, and plan to implement, source-specific compliance options."[80] The Court's holding highlights the issue of whether EPA's unreasonable timeframe will effectively prevent the agency from being responsive to public comments—e.g., technical errors; lack of evidence to support §112(n)(1)(A) analysis; impermissible MACT standards under section 112; health based standards; further subcategorization; and recognition that dry sorbent injection cannot resolve the acid gas issue.

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[78] *See also Kennecott Corp. v. EPA*, 684 F.2d 1007, 1118 (D.C. Cir. 1982) ("In all circumstances, EPA's failure to include" documents that serve to explain the Agency's "data" and "methodology" constitutes "reversible error," insofar as their absence "makes impossible any meaningful comment on the merits of EPA's assertions.").

[79] *Environmental Integrity Project v. EPA*, 425 F.3d 992, 996 (D.C. Cir. 2005).

[80] 76 Fed. Reg. at 25,056 (emphasis added).

In light of these rulemaking concerns, NMA urges EPA to promote an open and transparent rulemaking process by immediately seeking an extension of the current final deadline. The court acknowledged that the consent decree does permit extension. "The Court appreciates industry's concern that this schedule may be too hasty for the critical and expensive regulatory decisions that will be made; however, the proposed Consent Decree allows for a change of schedule if need be."[81] In fact, the judge added that if the scientific and factual basis for the rulemaking requires more time, "EPA can obtain it." NMA urges EPA to immediately seek an extension.

III. EPA'S APPROPRIATE AND NECESSARY DETERMINATIONS ARE INCONSISTENT WITH THE CLEAN AIR ACT

The proposed rule is based on a fundamental misreading of section 112(n)(1)(A). Congress purposefully treated EGUs differently than other source categories under section 112. Section 112(n)(1)(A) states:

> The Administrator shall perform a study of the hazards to public health reasonably anticipated to occur as a result of emissions by electric utility steam generating units of pollutants listed under subsection (b) of this section after imposition of the requirements of this Act. The Administrator shall develop the results of this study to the Congress within 3 years after November 15, 1990. The Administrator shall develop and describe in the Administrator's report to Congress alternative control strategies for emissions which may warrant regulation under this section. The Administrator shall regulate electric utility steam generating units under this section, if the Administrator finds such regulation is appropriate and necessary after considering the results of the study required by this subparagraph.

Based on the foregoing, Congress clearly did not intend to automatically subject EGUs to the normal "list and regulate" scheme of sections 112(c) and 112(d). Moreover, under this section, EPA could not regulate *at all* until it completed a study of the "hazards" to public health "reasonably anticipated to occur" as a result of HAP emissions from EGUs and then, only after considering the reductions of those hazards that would occur as a co-benefit of regulation of EGUs under other provisions of the CAA. Furthermore, the agency was directed to "develop and describe" alternative control strategies for emissions for any HAP emissions that "may warrant regulation under this section." Lastly, EPA could only regulate under section 112 if it found, after proper notice and comment rulemaking, that regulation of these units was "appropriate and necessary" after considering the results of the public health hazards study.

The history of EPA's various attempts at regulating mercury and other HAP emissions from EGUs under this provision is well-chronicled both in the preamble to the proposed rule and in UARG's comments. Importantly, there are two

[81] *American Nurses Ass'n. v. Lisa Jackson*, Civil Action No. 08-2198 (RMC p. 3 (Apr. 15, 2010)).

inescapable facts that EPA must grapple with in its decision to not only regulate mercury emissions, but also to extend the 2000 determination as the foundation for regulating all non-mercury HAPs under section 112(d).[82] First, the factual record and legal issues underpinning the December 2000 determination[83] has never been fully ventilated in front of the D.C. Circuit. The D.C. Circuit's *vacatur* of CAMR focused exclusively on the criteria for removing or delisting EGUs from the list of section 112(c) major source categories.[84] Accordingly, EPA's authority to regulate EGUs under section 112(d) is directly at issue during this rulemaking.[85]

Second, not only is EPA's requisite factual predicate finding under § 112(n)(1)(A) for mercury legally deficient, but the agency has not even attempted to undertake the same level of analysis for any other HAP it is proposing to regulate. EPA mistakenly believes it is legally compelled to regulate all HAPs under this regulatory construct stating, "…we interpret the statute to *require* the Agency to find it appropriate to regulate EGUs under section 112 if the Agency determines that the emissions of *one or more* HAP emitted from EGUs pose an identified or potential hazard to public health or the environment at the time the finding is made."[86] NMA joins UARG in its disagreement with this legal conclusion.

In addition to these and other serious flaws, NMA contends that EPA's interpretation of the term "appropriate" is so overbroad that it renders the entire analytical exercise required by Congress utterly meaningless. While EPA is correct that it has the discretion to define the contours of the inquiry within the bounds of reasonableness, it cannot merely pay lip service to the fact the agency throughout this entire process has maintained that "[s]ection 112(n)(1)(A) therefore sets an *important and unique condition precedent* for regulating Utility Units under section

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[82] Additionally, the Court did not opine on the legal and factual substance of EPA's 2005 Revision that it was not appropriate and necessary to regulate mercury emissions from EGUs.

[83] On December 14, 2000, then-Administrator Browner published a "notice of regulatory finding." This so-called notice stated the Administrator's "conclusion" that regulation of mercury emissions from EGUs was "appropriate and necessary" under section 112. *See* 65 Fed. Reg. 79825 (Dec. 20, 2000).

[84] *State of New Jersey v. EPA*, 517 F.3d 574 (D.C. Cir 2008).

[85] As UARG correctly states, the preamble specifically cites descriptions and explanations of EPA's Utility Study and the 2005 Revision. Collectively, the rulemaking record for this proceeding does not begin and end with the material posted to Docket ID No. EPA-HQ-OAR-2009-0234, but also includes two dockets earlier—namely, Docket ID No. A92-55 and Docket Id No. EPA-HQ-OAR-2002-0056. All of these should be referenced in some way to the instant docket to ensure that all pertinent material and comments are part of the complete rulemaking record.

[86] 76 Fed. Reg. at 24,987 (emphasis added).

112…."[87] EPA has not heeded this Congressional direction in the proposed rule as its interpretation of "appropriate" effectively overrides the primary congressional command to analyze "hazards to public health reasonably anticipated to occur" *from* EGUs.

Conversely, in order to ensure that EGUs are regulated under section 112 thereby leveling the market for electricity in the U.S.,[88] EPA's "necessary" interpretation is so narrow that it precludes consideration of the many measures under the CAA that have proven to effectively reduce mercury and HAP emissions in this country. This overly narrow statutory interpretation also infects the agency's ability to tailor its regulation of EGUs by investigating other viable regulatory programs on a cost-benefit basis.

A. EPA's Definition of "Appropriate" is Impermissibly Broad

EPA broadly defines the factors it may consider in determining whether regulation under section 112(n)(1)(A), far more broadly than it did in the 2005 Revision.[89] Under the proposed rule, EPA roams far afield from what should be the central consideration as to whether regulation is "appropriate," which is whether EGU emissions of HAPs create "hazards to public health." First, EPA states that, "we interpret the statute to authorize the Agency *to base the appropriate finding on either hazards to public health or the environment*."[90] The agency then goes on to explain that the "appropriate" inquiry may be based and expanded beyond impacts to the environment to also include HAP emissions from other sources. "The hazard to public health or the environment may be the result of HAP emissions *from EGUs alone or the result of HAP emissions from EGUs in conjunction with HAP emissions from other sources*."[91] Lastly, the agency believes the "appropriate" prong may also consider the impacts of HAPs internationally, which "would allow the U.S. to demonstrate effective technologies to reduce Hg; such leadership could provide confidence to other countries that they can succeed in meeting their commitments."[92] Indeed, it appears as if EPA believes it has the discretion to base

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87 70 Fed. Reg. at 15,994, 15998 (Mar. 25, 2005) (emphasis added); *see also* 76 Fed. Reg. at 24,987 (reaffirming the 2005 Revision stating, "…the Utility Study is an important condition precedent to making the appropriate and necessary determination).

88 76 Fed. Reg. at 24,979.

89 On March 29, 2005, EPA concluded its rulemaking under section112. EPA concluded that "[b]ecause this new information demonstrates that the level of Hg emissions projected to remain 'after the imposition of' section 110(a)(2)(D) does not cause hazards to public health, we conclude that it is not appropriate to regulate coal-fired Utility Units under § 112 on the basis of Hg emissions." 70 Fed. Reg. 16,004.

90 76 Fed. Reg. at 24,988 (emphasis added).

91 76 Fed. Reg. at 24,988 (emphasis added).

92 76 Fed. Reg. at 25,015.

this determination on some broader set of criteria not contemplated by Congress under section 112(n). It does not.

EPA grounds this expansive and sweeping interpretation in the belief that Congress implicitly authorized EPA to treat these other factors at least on par with public health hazards because it was authorized to consider these other factors in the Mercury Study pursuant to § 112(n)(1)(B) and the National Academy of Sciences ("NAS") Study in § 112(n)(1)(C). This is a distortion of the statutory language. Nowhere in section 112(n)(1)(A) does the term "environmental effects" appear nor does (n)(1)(A) require EPA to even consider the results of the Mercury Study or NAS Study prior to determining whether or not it is appropriate and necessary to regulate. Furthermore, on the face of subparagraph (n)(1)(B), the agency was not even required to complete the Mercury Study until one year *after* Congress directed the EPA to complete the Utility Study. EPA's interpretation is without merit.

The interpretation in the 2005 Revision aligns much more closely with the statutory language than the interpretation proffered by the proposed rule or in the 2000 determination. EPA stated in 2005, "[t]his *mild direction* [mercury study], when paired with the considerable discretion inherent in any judgment about whether an action is "appropriate and necessary," has led EPA to conclude that the statute permits the agency to consider other relevant factors when determining whether to regulate emissions from utility units under section 112;" however the agency confines this consideration by noting that "…these factors may not independently, or in conjunction with one another, justify regulation under section 112(n) when EPA has concluded that hazards to U.S. public health are not reasonably anticipated to occur."[93] Thus, EPA cannot conclude that it is authorized to override the primary inquiry from Congress—*i.e.* hazards to public health reasonably anticipated to occur from EGUs.

The 2005 Revision goes on to cite the U.S. Supreme Court's holding in *Russello v. United States*,[94] that "where Congress includes particular language in one section of a statute but omits it in another section of the same Act, it is generally presumed that Congress acts intentionally…in the disparate inclusion or exclusion."[95] Thus, if Congress had meant for the agency to make an "appropriate" finding based on environmental factors, emissions from other source categories, and in support of international efforts, it would not have gone to such great lengths to include this particular provision in the CAA. Rather, Congress would have directed the agency to list EGUs under § 112(c) from the outset and promulgate MACT standards under section 112(d).

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[93] 70 Fed. Reg. at 15,998.

[94] 464 U.S. 16, 23 (1983).

[95] 464 U.S. 16, 23 (1983).

The underlying question in this exercise of statutory construction is why EPA needs to impermissibly expand the inquiry—hazards to public health—and confer great weight to and base its determination on this broader set of criteria to validate its "appropriate" finding. Again, and as detailed above, the overall accredited benefits to mercury reduction are particularly telling. Because the HAP of "greatest concern" derives so little health benefit from command-and-control regulation, the agency must use these other factors in an unlawful attempt to overcome the irrefutable fact that HAP emissions from EGUs pose little or no threat to public health. EPA's regulation of mercury under section 112(d) is clearly contrary to the statutory scheme developed by Congress.

To ameliorate this criticism, of heavy regulation for little environmental benefit, EPA invokes the U.S. Supreme Court's decision in *Massachusetts v. EPA* for the proposition that even if the benefits of regulating are negligible, EPA still must promulgate standards under section 112. This decision is inapposite of the facts at issue in this rulemaking.

Whereas in *Massachusetts* the Supreme Court rejected the EPA's use of "policy considerations" as a shield to deny a rulemaking petition urging the agency to regulate GHG emissions from new automobiles,[96] the agency in this setting is attempting to use the very same "policy considerations" as a sword for regulating HAP emissions from EGUs. In rejecting EPA's then-position, the Court emphasized that the agency may not rest its decision to regulate or not to regulate on "reasoning divorced from the statutory text."[97] Again, the fact that EPA must highlight international efforts as a basis for regulation further illustrates its lack of proper legal and factual support under in § 112(n)(1)(A).

B. EPA's "Necessary" Finding is Overly Narrow and Does Not Comport with Congressional Intent

In contrast to EPA's impermissibly broad reading of the "appropriate" prong, the agency's "necessary" interpretation is so arbitrarily narrow that it clearly contravenes the intent of the statute. Moreover, it provides another example of the agency exacting the highest level of stringency on a particular source when the facts support a more reasonable approach. This interpretation renders the entire section 112(n)(1)(A) analysis superfluous.

EPA claims the only programs under the CAA that qualify under the necessary prong are those that "guarantee" emissions reductions directly from EGUs. The agency states that "[w]e may find it necessary to regulate EGUs under section 112 even if we were to conclude, based on reasonable estimations of emissions reductions, that the imposition of the CAA would, or might, significantly reduce the identified hazard, because *the only way to guarantee that such*

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[96] 549 U.S. at 532-34.

[97] *Id.* at 532.

reductions will occur at all EGUs and be maintained is through a section 112(d) standard that directly regulates HAP emissions from utilities."[98]

Requiring this level of scrutiny is not what Congress envisioned when it carved EGUs out of the normal section 112 regulatory scheme. Indeed, Representative Oxley noted that "…*if* the Administrator regulates any of these units, he may regulate only those units that he determines—*after taking into account compliance with all other provisions of the CAA* and any other federal, state, or local regulation and voluntary emission reductions—have been demonstrated to cause a significant threat of adverse effects on public health."[99] Clearly, Congress was more concerned with the actual impact to public health and whether those impacts were being addressed by any level of government, rather than only crediting "guaranteed" federal command-and-control efforts.

According to the proposed rule, the only program under the CAA that falls within the ambit of the necessary analysis is the Acid Rain Program ("ARP"). EPA notes that the ARP qualifies because it contained very specific emissions reduction requirements to be completed during a tight compliance timeframe. Importantly, the actual implementation of those emission targets was largely left to the individual utility where "source owners or operators could elect to install controls, such as scrubbers, switch to lower sulfur fuels at their facilities or purchase allowances from other EGUs that had reduced their emissions beyond what they were required by the ARP to achieve." [100]

By comparison, EPA established a similar program with the promulgation of the Clean Air Interstate Rule ("CAIR") pursuant to section 110(a)(2)(D)(i)(I). CAIR required a number of eastern states to develop State Implementation Plans ("SIPs") providing for substantial reductions of SO_2 and NOx emissions largely through the same implementation scheme as ARP—installation of scrubbers, SCRs or purchasing allowances. In the 2005 Revision, EPA at least inherently recognized the similarity, and accordingly, analyzed CAIR's impact and concluded that "that the technologies that most cost-effectively achieve SO_2 and NOx reductions for utilities are scrubbers for SO_2 and SCR for NOx. These technologies, as noted above, result in reductions of utility Hg emissions."[101]

The proposed rule likewise acknowledges the 2005 Revision's CAIR analysis, but simply concludes that CAIR was remanded back to the agency in *North Carolina v. EPA* with no further discussion. While CAIR was remanded by the D.C. Circuit, the court allowed it to remain in place until the agency finalized its successor—CSAPR. Like CAIR, CSAPR primarily addresses emissions from EGUs in 27 eastern

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[98] 76 Fed. Reg. at 24,990.

[99] 136 Cong. Rec. H12911, 12934 (daily ed. Oct. 26, 1990) (Statement of Rep. Oxley) (emphasis added).

[100] 76 Fed. Reg. at 24,990.

[101] 70 Fed. Reg. at 16,004.

states. EPA claims that CSAPR will require a reduction of SO_2 from EGUs by 73 percent from 2005 levels and 54 percent for NOx emissions. NMA contends that the consideration of the achievements of CAIR and its successor should not have ended with this conclusory statement.

Notwithstanding the similarities between CAIR/CSAPR and ARP, EPA does not include these programs within its necessary analysis. The agency claims that it is reasonable to exclude these programs by interpreting the phrase "after the imposition of the Act" as only requiring "consideration of those requirements that Congress *directly imposed on EGUs* through the CAA as amended in 1990 and for which EPA could reasonably predict emissions reductions at the time of the Utility Study."[102] Had Congress intended this reading it would have specified in subparagraph (n)(1)(A) "…after the imposition of the requirements of Title IV of this chapter," but it did not. NMA can find no legal or factual basis in support of this conclusion because Congress clearly appreciated the numerous programs, not just the ARP, which EGUs and other sources would be subject to with the amendments to the CAA. Hence the reason for § 112(n)(1)(A). EPA's conclusion here is fundamentally flawed and cannot withstand judicial scrutiny.

Returning to the appropriate analysis, EPA is willing to supplement the record with new information to support its 2000 "appropriate" determination; however, the agency refuses to do the same record augmentation in its "necessary" analysis. EPA cannot have it both ways, especially after it already considered CAIR's impact in the 2005 Revision.[103] As an aside, EPA conveniently cites CAIR in the proposed rule as a prime example of utilities "engaging in forward planning" to support its assertion that the necessary controls can be added within the MACT timeframe, but is quick to minimize the same program's benefits in other analyses within the same rule.

Lastly, EPA's discounting of the considerable achievements in air quality through the NAAQS program is particularly puzzling. After engaging in a series of shoulder-shrugging exercises, the agency concludes that the NAAQS program cannot be factored into the necessary analysis because "EPA cannot predict with any certainty precisely how states will ensure that the reductions needed to meet the NAAQS will be realized."[104] This conclusion is suspect for at least two reasons. First, EPA does in fact have the legal authority under section 110 of the CAA to find that a state implementation plan is substantially inadequate to attain or maintain the NAAQS, also known as a "SIP Call." After receiving the SIP Call, if the named state fails to complete a SIP revision or if EPA disapproves of such a revision, such

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[102] 76 Fed. Reg. at 24,991 (emphasis added).

[103] *See Nat'l Cable & Telecommunication Ass'n v. Brand X Internet Services*, 545 U.S. 967, 981 (2005) where an agency may pursue a different regulatory interpretation so long as it is consistent with the statute and is supported by a rational explanation for the deviation. EPA has not done so in this instance.

[104] 76 Fed. Reg. at 24,991.

a finding will trigger clocks for mandatory sanctions and an obligation for *EPA to impose a Federal Implementation Plan* ("FIP"). Thus, EPA clearly has the authority to hold states accountable if the NAAQS program is not being administered properly. Doubts about the implementation of the NAAQS program is not a compelling argument for excluding those benefits from the necessary analysis.

C. EPA is Not Compelled to Regulate EGUs under a MACT Standard

EPA mistakenly believes that once a positive appropriate and necessary finding has been made, the agency has no choice but to list the source and promulgate MACT standards *for mercury and all HAPs* under section 112(d) despite never attempting to make a health-based finding for the other non-mercury HAPs. NMA does not concur with this statutory interpretation.[105] Indeed, a correct reading of the regulatory language under § 112(n)(1)(A) provides EPA with the opportunity to develop a properly tailored regulation achieving environmental benefit commensurate with the cost.

Assuming *arguendo* that EPA has adequately determined it is both appropriate and necessary to regulate *mercury emissions* from utilities, the statutory phrase "under this section" evinces the intent of Congress that a positive finding for mercury does not automatically subject EGUs to a MACT standard under section 112(d). Nowhere in section 112(n)(1)(A) is EPA directed or compelled to do this. By comparison, section 112(c)(2) does specifically compel that "the Administrator shall establish emissions standards *under subsection (d) of this section*." (emphasis added). Therefore, had Congress wanted EGUs to be specifically regulated under § 112(d) following the appropriate and necessary determination, it would have so directed.

Additionally, the CAA directs EPA to develop and describe "alternative control strategies for emissions which may warrant regulation under this section." This language leaves little doubt that Congress contemplated other regulatory options other than the MACT option the agency mistakenly believes it is compelled to observe. Furthermore, in developing these alternative control strategies, EPA can and should consider the cost of control technology. Despite EPA's protestations to the contrary, the comparison of alternative control strategies necessarily implies cost. Interestingly, and with a far less compelling invitation to inject environmental concerns into the appropriate analysis, the agency steadfastly maintains that Congress did not contemplate cost as a basis for regulatory comparison. "Finally,

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[105] As the D.C. Circuit has made clear, an "agency regulation must be declared invalid,'" even though the agency "might be able to adopt the regulation in the exercise of its discretion,'" if the regulation "was not based on the [agency's] own judgment'" but "rather on the unjustified assumption that it was Congress' judgment that such [a regulation] is desirable 'or required." *See Transitional Hospitals Corp. v. Shalala*, 222 F. 3d 1019, 1029 (D.C. Cir 2000), *quoting Prill v. NLRB*, 755 F.2d 941, 948 (D.C. Cir. 1985).

significantly, nowhere in section 112(n)(1)(A) does Congress require the consideration of costs in assessing health and environmental impacts."[106]

This flatly distorts the statutory language. In fact, Representative Oxley stated that "[t]he conference committee produced a utility air toxics provision that will provide ample protection of the public health *while avoiding the imposition of excessive and unnecessary costs on residential, industrial and commercial consumers of electricity*."[107] Moreover, EPA's argument is legally deficient as the D.C. Circuit in *Michigan v. EPA* held "[i]t is only where there is 'clear congressional intent to preclude consideration of cost' that we find agencies barred from considering costs."[108] Consequently, when viewed through the lens of heavy regulatory burdens for little to no incremental health benefit, the agency should promulgate alternative control strategies to deal with an issue with little impact to public health. Without such an approach the agency employs a blunt hammer in a situation begging for the precision of a sharp scalpel.

EPA's argument that the CAA requires MACT standards for *all HAPs* based on a positive mercury predicate finding is equally misguided. As stated previously, at no point in EPA's consideration of this issue has it made an affirmative health-based finding for any HAP other than mercury.

The agency's attempt to shoehorn the D.C. Circuit's decision in *National Lime* to support this conclusion is also unavailing. In that case, the court's decision turned on language of § 112(d)(1) rather than the subsection at issue in the instant rulemaking. Since EGUs were purposefully omitted from that section by Congress, the decision has limited persuasive value under the present circumstances.

Moreover, EPA claims it is still appropriate to regulate non-mercury HAPs because "emissions of these HAP from some EGUs pose a cancer risk greater than one in one million to the most exposed individual."[109] EPA is attempting to use the delisting criteria in § 112(c) to obfuscate the proper statutory analysis. For EGUs, the delisting criteria are not applicable until the agency has actually made the proper requisite factual finding for the HAPs EPA is proposing to regulate. To date, EPA has not done this, especially for the non-mercury HAPs. Consistent with the 2005 Revision that "EPA has neither discovered information on hazards to public health arising from Utility Unit emissions of acid gases based on its own efforts, nor received such information…,"[110] the agency still does not have the requisite data to conclude that non-mercury HAPs should be regulated under section 112(d).

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106 76 Fed. Reg. at 24,987.

107 136 Cong. Rec. H12911, 12934 (daily ed. Oct. 26, 1990) (statement of Rep. Oxley) (emphasis added).

108 213 F.3d 663, 678 (D.C. Cir. 2000), cert. den., 532 U.S. 903 (2001) (internal citation omitted).

109 76 Fed. Reg. at 24,999.

110 70 Fed. Reg. at 16,007.

IV. EPA'S HAP-BY-HAP APPROACH TO DETERMINING THE MACT FLOOR IS NOT PERMITTED BY THE CLEAN AIR ACT

EPA continues to set MACT floors based on an impermissible interpretation of the CAA. The proposed MACT standards are based on a pollutant-by-pollutant approach relying on a different set of best performing sources for each HAP standard.

> For each pollutant, we calculated the MACT floor for a subcategory of sources by ranking all the available emissions data obtained through the 2010 ICR from units within the subcategory from lowest emissions to highest emissions (on a lb/MMBtu basis), and then taking the numerical average of the test results from the best performing (lowest emitting) 12 percent of the sources.[111]

The result of the agency's HAP-by-HAP approach is a set of standards that reflect the performance of a hypothetical set of best performing sources that simultaneously achieve the greatest emission reductions for all regulated HAPs. This analytical framework distorts the statutory language because it is unlikely that any single existing plant can meet all of the MACT limits on a continuous basis during all phases of operation without some addition and/or optimization of control devices. In fact, optimization of control device combinations for one pollutant or set of pollutants could have countervailing effects on the emissions of other HAPs.

Section 112(d)(3) of the CAA expressly requires that emission limitations for new units should not be less stringent "than the emission control that is achieved in practice by the *best controlled similar source.*" (emphasis added). For existing units, the emission standards "shall not be less stringent, and may be more stringent than—the average emission limitation achieved by the best performing 12 percent of existing *sources*." CAA § 112(d)(3)(A) (emphasis added). Section 112(a) defines "major source" as any stationary sources located within a contiguous area and under common control." Section 112(a) defines "area source" as "any stationary source…that is not a major source." That same section defines the term "stationary source" consistent with the meaning articulated under CAA § 111(a). That subsection, in turn, defines a "stationary source" as "any building, structure, facility, or installation which emits or may emit any air pollutant." CAA § 111(a)(3).

Collectively, these statutory provisions evince clear congressional intent that MACT standards promulgated under section 112(d) must be based on the actual performance of an actual operating source or sources. The CAA does not permit the agency to base § 112(d) standards on a hypothetical amalgamation of ideal units nor does the statue permit the "emissions control" achieved by the best sources to be determined on a group of best performing units. If this was the intent of Congress, it would have added language ordering EPA to set new source

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[111] 76 Fed. Reg. at 25,041.

limits based on the performance achieved in practice by the best controlled source "for each HAP." No such language exists for either existing or new sources.[112]

Based on the information EPA provided to UJAE, there is little or no evidence in the rulemaking docket to conclude that EPA seriously considered whether any existing unit can meet all of the proposed MACT standards under real world conditions. A prime example of this failure to investigate is the proposed emissions standard for particulate matter. EPA's sample of 131 units used to determine the particulate matter floor is inappropriate and fails to account for the antagonistic effects that adding multiple different pollution control devices can have on an EGU's HAP emissions.

As UARG states in its comments, the docket reveals that at least 47 of the 131 units selected for best performing metric for particulate matter had a baghouse without a scrubber. This is a significant oversight because either the acid gas emissions standard or CSAPR will force these plants to install either a scrubber, DSI and mercury controls. Installing these types of technology will obviously increase the particulate matter emissions, thus the sample average emissions rate is biased low. The particulate matter standard needs to reflect the impending reality of what control technology will be required of an existing plant as a result of EPA's regulatory approach, i.e. a scrubber, mercury control and baghouse. EPA must discard these plants in setting the MACT floor for particulate matter.

Moreover, the use of DSI to meet the acid gas MACT-subcategory may actually impede the ability of a unit to comply with the mercury standards. Again UARG states it in its comments that the use of DSI and the injection of Trona generate increased levels of NOx, which in turn degrades the efficacy of activated carbon used for mercury control. This impact was witnessed during a demonstration test at the Presque Isle Station unit equipped with a Toxecon system. EPA does not even attempt to grapple with this issue. Ironically, this oversight encapsulates the entire rulemaking process—the so-called "HAP of greatest concern" may be prevented from meeting the proposed standard because of EPA's decision to regulate acid gases without a proper regulatory foundation and claim that HAP to be effectively controlled by an unproven technology to simultaneously mask the costs of compliance and buttress a dubious benefits analysis.

Lastly, EPA errs in its MACT floor calculation for mercury as the floor should have been based on the best performing 12 percent of all existing EGUS. Section 112(d)(3)(A) of the CAA specifies that EPA must set a MACT limit for existing units

[112] As stated in UARG's comments, EPA's pollutant-by-pollutant approach under section 112(d)(3) also renders the beyond-the-floor analysis a pointless exercise. By choosing the best performing units for each HAP, EPA moves away from what those units actually "achieve" in emissions reductions for all HAPs and, instead, attempts to define what is "achievable" by a hypothetical unit equipped with the best pollution control equipment to achieve the maximum emissions reduction for each HAP. Thus, EPA transforms the "achievable" test of section 112(d)(2) into the MACT-floor determination under section 112(d)(3).

at least as stringent as "the average emission limitation achieved by the best performing 12 percent of the existing sources (for which the Administrator has emission information)." This is the MACT-floor.

EPA should have maintained its commitment to calculate the mercury MACT floor based on the average emissions achieved by the best performing 12 percent of the units in the entire source category—127 units.[113] Instead, EPA used emissions data from 40 units to calculate the MACT floor average for mercury.[114] The agency then accounted for variability by calibrating the upper prediction limit ("UPL") to derive the final MACT floor. Due to the variability analysis, the UPL is actually larger than the MACT floor average for the 40 units. In fact, 154 units submitted mercury emissions data below the final UPL for mercury. Similarly, EPA used 130 units for the MACT floor averages for particulate matter and HCl; however, 151 and 178 units submitted emission values below the respective UPLs.[115] Theoretically, each of these 154, 151, and 178 units are compliant with at least one MACT floor begging the question of how many actually comply with all of the proposed NESHAPs. In reality, only 34 units or *about 3 percent* of the total population of units are able to meet all of the proposed standards.

Moreover, this is a conservative approach as it likely overestimates the number of compliant units because measuring below the level once does not guarantee compliance on a continuous basis.[116] Therefore, EPA has failed to investigate a fundamental aspect of the proposed rulemaking because the MACT floor for these HAPs does not appear to be based on the top performing 12 percent of units. Such failure renders this rule arbitrary and capricious and contrary to the provisions of the Clean Air Act.

In conclusion, EPA's HAP-by-HAP approach is not authorized under the CAA. EPA must reconsider its emissions standards to reflect the performance of an actual operating unit.

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[113] *See* UARG's comments describing the process, including OMB's involvement, by which EPA committed to base the MACT floor for mercury on the emissions data from the entire source category.

[114] Spreadsheet downloaded from EPA, floor_analysis_coal_hg_051811 REVISED.xlsx; available at: www.epa.gov/ttn/atw/utility/utilitypg.html .

[115] Spreadsheet downloaded from EPA, floor_analysis_coal_hcl_031611.xlsx; and floor_analysis_coal_pm_031611.xlsx; available at: www.epa.gov/ttn/atw/utility/utilitypg.html .

[116] *See Sierra Club v. EPA*, 167 F.3d at 665 ("if an emission standard is as stringent as 'the emissions control that is achieved in practice' by a particular unit, then that particular unit will not violate the standard. This only results if 'achieved in practice' is interpreted to mean 'achieved under the worst foreseeable circumstances.'").

V. EPA'S NEW SOURCE STANDARDS VIRTUALLY ELIMINATE NEW COAL PLANTS

One of NMA's principal objectives in this rulemaking is to ensure that new coal-fueled generating sources can be permitted in a timely and economic manner, consistent with the nation's need for reliable and cost effective electricity supplies while also fully complying with the applicable environmental safeguards. EPA's emissions standards for new sources are directly at odds with this objective. The agency's decision to effectively foreclose this vital energy source will have dramatic and cascading effects on the nation's economic future. Indeed, EPA's position contradicts Secretary of Energy Steven Chu's assessment that "prosperity depends on reliable, affordable access to energy. Coal…is likely to be a major and growing source of electricity generation for the foreseeable future."[117]

Indeed, by foreclosing the option to build new coal plants, EPA is effecting a major change in U.S. energy policy without authority to do so under the CAA, without even notice-and-comment rulemaking on such policy, without undertaking any of the analysis required by a host of statutes and executive orders (including those set forth at the end of the preamble to EPA's proposed rule), and indeed without even admitting that it is doing so. EPA has no authority to redefine energy policy in this fashion and should make sure that the final rule departs from this practice.

EPA claims it is *possible* to build a new coal plant. During the interagency review process this question was directly posed to EPA:

> Emission limits for new units are so stringent we expect they will effectively stop new coal unit construction, an impact not adequately addressed in the impact analysis. **Can EPA include a discussion of this outcome and its likelihood?**"
>
> **EPA's Response:** Based on the 2010 ICR data, the proposed new-source limits for coal-fired EGUs are currently being met by a number of existing units for each of the HAP groups, thus we do not think *the limits will stop the construction of new coal-fired EGUs.*[118]

At best, this response is evasive. While it may be true that each of the individual new-unit HAPs are met by one or more existing units, it is not true that *any* plant meets *all* of the standards, as EPA well knows. Comments filed with EPA in this docket on July 8, 2011 by UJAE contains information provided to that group by EPA as to which existing units meet EPA's proposed standards for new and existing units. As shown in the tabular information attached to those comments, no existing unit *meets all of the proposed new-unit MACT standards*. As UJAE concluded:

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[117] U.S. Secretary of Energy Steven Chu. "Memorandum." Oct. 12, 2009.

[118] Interagency Comments at 15 (emphasis added).

The proposed MATS rule would preclude the construction of any new coal-based electric generating units due to the severity of its emissions limitations for mercury, acid gases and particulate matter ("PM"). Data provided by EPA on June 8, 2011, show that no unit in EPA's sample of more than 200 coal-based generating units meets the combined MATS new source emission limits for mercury, acid gases, and PM.

EPA's new-unit standards, thus, are the product of the same impermissible HAP-by-HAP approach to setting emissions standards that EPA used for setting the existing-unit standards. As is the case for existing plants, section 112(d)(3) clearly states that new standards must be based on "the maximum degree of reduction in emissions that is deemed achievable for new sources in a category…shall not be less stringent that the *emission control that is achieved in practice by the best controlled similar source….*" 42 U.S.C. § 7412(d)(3) (emphasis added). The emphasis on "source" necessarily means that a single plant can actually meet all three MACT standards during the "worst foreseeable conditions."

The flaw in EPA's use of the "Franken-plant" approach to setting standards is heightened for new units because new units will be required to use best available control technology, including wet/dry scrubbing technology, SCRs and baghouses. Use of all of these technologies together will mean that certain HAPs cannot be controlled to the same limits that they could be if not all of these technologies were deployed.

The dilemma is demonstrated in the two plants that EPA examined in setting the new-unit PM limit, the AES Hawaii and Dunkirk units. Neither plant reflects the type of coal and/or control technology expected in the operational profile of a new coal plant. In fact, both likely candidates suffer from the same basic flaw—which is, they both use a baghouse without a scrubber. Use of a scrubber, however, would increase their PM emissions.

Specifically, the AES Hawaiian plant burns some of the lowest sulfur coal in the world from Indonesia, employs a baghouse without a scrubber, and a generating capacity of only 180 MW.[119] As EPA is well aware, operation of a scrubber will undoubtedly increase particulate matter; and with the proposed acid gas emissions standard in place, no plant will be permitted without a scrubber and baghouse.[120] Furthermore, this plant supplements its coal usage by burning old tires, used motor oil, and carbon filters from the local water authority. EPA is required pursuant to section 112(d)(3)(A) to set new source limits based on the "emission control that is achieved in practice by the best performing similar source." AES Hawaii clearly does not meet this statutory requirement. The Dunkirk

[119] *See* floor_analysis_coal_pm_031611.xlsx, floor_analysis_coal_hcl_031611.xlsx, and floor_analysis_coal_hg_051811.xlsx.

[120] Indeed, the HCl results for the AES plant reported in the ICR data are *66 times* the proposed new unit HCl standard.

plant, by contrast, burns PRB coal with a fabric filter and DSI but no scrubbing technology. This unit could not meet current Best Available Control Technology ("BACT") requirements for the control of SO2 and NOx emissions.[121] Like the Hawaiian plant, to meet BACT this plant would need scrubbing technology for SO2 control, selective catalytic reduction ("SCR") for NOx control and a baghouse or fabric filter for PM control. Thus, these plants are not representative of the operational profile for new coal units.

Indeed, the RIA forecasts the type of control equipment needed to comply with the proposed standards—"[a]cid gas emissions (including SO_2) can be reduced with flue gas desulfurization (FGD, also known as "scrubbers") or with dry sorbent injection (DSI)…An alternative to wet and dry scrubber technology is dry sorbent injection (DSI), which injects an alkaline powdered material (post combustion) to react with acid gases. The reacted product is removed by particulate matter (PM) control device. DSI technology is most efficient with a baghouse downstream but can function with an electrostatic precipitator (ESP) downstream as well."[122] Regardless of whether EPA's assessment of DSI is correct, a new plant will not exist with just a fabric filter. Therefore, selection of a plant that does not have this control technology will not exist in reality, and accordingly, its selection as the best performing "similar" source is contrary to the plain language of the CAA.

This HAP-by-HAP issue is not just limited to the particulate matter standard as the feasibility of meeting the new mercury standards is also questionable. The plant selected as the best performing for mercury as cited in the May 18, 2010 data revision—the 20-year-old Nucla plant—also suffers from the same basic flaws as identified in the particulate matter example. The Nucla plant is a circulating fluidized bed plant in Colorado that burns a particular type of coal that has a significant amount of inertinite as compared to most other U.S. coals. This factor increases the amount of unburned carbon in the fly ash and promotes better mercury capture. Given this key difference in feedstock, EPA should have selected a more representative plant for the best performing source. Furthermore, and illustrative of the Franken-plant issue, this particular plant's total particulate matter measurement during ICR stack testing is almost an order of magnitude above the proposed new unit total PM limit.

EPA claims that its standards for a new coal-fired EGU are simply a product of the stack testing data; hence, the standards are achievable. Again the interagency comments shed important light on EPA's lack of reasoned decision-making:

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[121] Additionally, the same EPA spreadsheet showing AES Hawaii to be the best performing source and the basis for the new unit PM limit (UPL = 0.049 lb/MWh) also shows that Dunkirk's UPL is equivalent to 0.14 lb/MWh. Accordingly, if EPA is relying on Dunkirk at the best performing, it must significantly alter the new unit PM

[122] RIA, "7.4 Pollution Control Technologies," at 205.

> Is it possible that EPA intended to propose a mercury standard for new sources of 0.00001 lb/MWh rather than 0.00001/GWh? Based on a quick analysis, the standard appears to be three orders of magnitude more stringent than the standard for existing plants and would require greater than 99% total mercury removal at all new PC-fired coal plants. This proposed standard is also below the detection limit of CEMS instrumentation—has EPA considered this in requiring Hg CEMS?
>
> **EPA's Response:** The fact that the proposed new-source limit is three orders of magnitude more stringent than the limit for existing sources is a *reflection of the data.*[123]

This was not a reflection of the data. As mentioned previously, UARG effectively forced the agency to admit a substantial error in calculating the emissions standard for mercury. In fact, it was the exactly the same error the interagency commentor raised, confusing MWh and GWh, and was summarily dismissed by EPA.

Even accounting for this error in calculation, EPA still does not provide persuasive evidence based on the data that a coal-fired EGU can meet all of the new source emissions standards. A review of the 2007 EIA-860 Report, which EPA considered in developing the proposed rule, reveals that in the past decade only 40 new coal-fired EGUs have been built or are currently under construction.[124] Of those 40 units, 18 have begun to operate and reported mercury emissions data to EPA.[125] Without considering variability, and more than likely operating in unrepresentative test conditions, the mercury emissions data for these plants averaged 1.8 #Hg/TBtu. Only two units reported tests below 0.2 #Hg/TBtu and the lowest recorded emissions was 0.07 #Hg/TBtu. Thus, on average, these units do not consistently achieve the existing source standards let alone the far more stringent new source emissions standards for mercury.

Not only do the foregoing examples illustrate EPA's indefensible and impractical method for setting emissions standards, they also highlight some of the ever growing uncertainties surrounding the construction of a new coal-fired plant. In fact, the preamble admits as much stating that, "[a]lthough multiple coal-fired EGUs have recently commenced operation and several are currently under construction, *no new coal-fired EGUs have commenced construction in either 2009 or 2010*. In addition, forecasts of new generation from both the EIA and Edison Electric Institute *do not project any new coal-fired EGUs being constructed in the short term*. This is an indication that, in the near term, few new coal-fired EGUs

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123 Interagency Comments at 13.

124 76 Fed. Reg. 25,022.

125 Mercury Floor Analysis, floor_analysis_coal_hg_051811REVISED.xls, available at: http://www.epa.gov/ttn/atw/utility/utilitypg.html.

will be subject to NSPS amendments."[126] Adding EPA's new source standards will ensure this trend becomes a self-fulfilling prophesy.

Indeed, EPA seems to be motivated by the improper purpose of phasing out coal plants. Although the agency states that mandating fuel switching from coal to natural gas represents an "unreasonable regulatory option,"[127] the preamble further notes the agency's desire to "level the playing field" and that "…the proposed rule will require companies to make a decision—control HAP emissions from virtually uncontrolled sources or retire these sometimes 60 year old units and *shift their emphasis to more efficient, cleaner modern methods of generation*, including modern coal-fired generation."[128]

Prior to making a final decision, EPA must conform to the strictures of and legislative intent behind section 112. The House Report on section 112, for example, states: "In the determination of MACT for new and existing sources, consideration of cost should be based on an evaluation of the cost of various control options. The Committee expects MACT to be meaningful, so that MACT will require substantial reductions in emissions from uncontrolled levels. *However, MACT is not intended to require unsafe control measure, or to drive sources to the brink of shutdown.*"[129] EPA's new source emissions standards run counter to this intent.

The agency must give careful consideration to the deleterious consequences of proposing standards that effectively preclude the construction of new coal-fired EGUs in this country. Replacing the lost generation of existing coal-fired EGUs without the option of new coal will clearly increase the cost of electricity and impact the overall economy. Comparing the levelized cost of electricity (LCOE) for solar generation, for example, is more than six-times the cost of coal-based, while wind power is roughly 60 percent more expensive.[130]

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126 76 Fed. Reg. at 25,072.

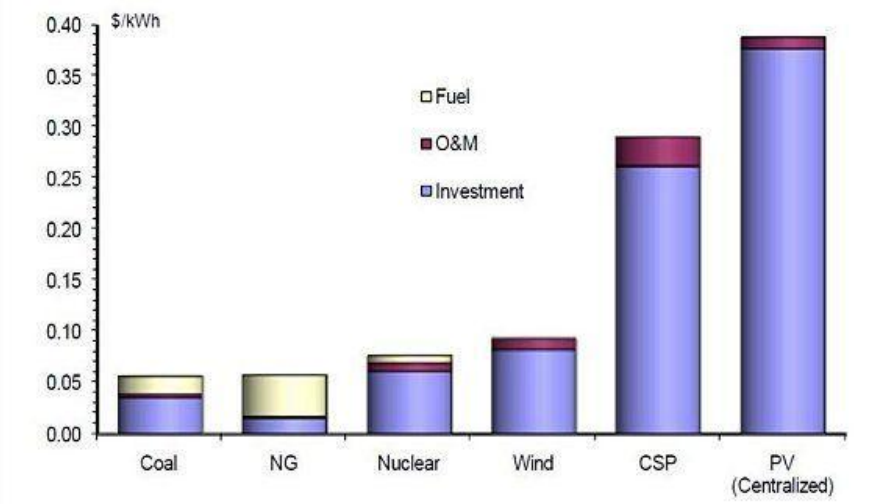
127 76 Fed. Reg. at 25,048.

128 76 Fed. Reg. at 24,979 (emphasis added).

129 House Rep. 101-490, Part 1, at 328.

130 Black and Veatch.

Table 4
Levelized Cost of Electricity (LCOE)



Source: Byrne et al, 2008. Data Sources(NEA/IEA 2005, Falk et al 2008, LAZARD 2008, ESMAP/World Bank 2008, IEA 2008)

Even replacing coal with natural gas is problematic given that over 70 percent of the LCOE for gas is based on the cost of the fuel itself, which is highly volatile. Prices for natural gas spiked from $6/MMBtu to $13/MMBtu in 2005 due to declining production from shrinking domestic reserves and interruptions caused by Hurricanes Ivan and Katrina. Additionally, within two years proven shale gas reserves have created numerous environmental issues, including hydrofracking, drinking water contamination and significantly more methane emissions. Clearly, this policy discussion should not be made by administrative fiat but only after due consideration has been given at the congressional level.

NMA urges EPA to examine a constructive policy framework that removes this and other regulatory impediments and promotes the deployment of advanced coal technologies. In the United States, replacing our older coal plants with advanced supercritical generation could create $1.2 trillion in economic benefits and 6 million jobs during construction. Moreover, this economic success would not have to be at the expense of maintaining or improving our environmental progress as some 440 million metric tons of CO2 would be avoided even without deploying carbon capture and storage.[131]

[131] International Energy Agency: "Coal-Fired Power Generation: Replacement/Retrofitting Older Plants," 2008; Management Information Services and Peabody analysis.

VI. EPA'S PERFORMANCE STANDARDS RUN COUNTER TO THE CAA

Under section 111(a)(1) of the CAA:

> The term "standard of performance" means a standard for emissions of air pollutants which reflects the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated.

New Source Performance Standards ("NSPS") must therefore reflect the degree of emission reduction achievable through the application of the best adequately demonstrated system of continuous emission reduction, taking into account cost, nonair environmental impacts and energy policy issues. EPA has failed to adhere to this statutory construct.

NMA incorporates and adopts by reference the comments of UARG regarding EPA's proposed NSPS for subpart Da. NMA believes that EPA's ill-advised rulemaking schedule has created overly aggressive and inflexible performance standards that will further stymie economic growth in this country. As mentioned previously, EPA's stated goal to "level the playing field" in the electric generating sector is short-sighted and will discourage improvement in technology, raise the cost of electricity and harm the economic well-being of this country. EPA needs to rescind its proposed revisions for new and reconstructed subpart Da units and reinstate the former standards of performance.

Of particular concern, CAA § 111(a)(1) requires EPA to "tak[e] into consideration the cost of achieving such reduction…" Notwithstanding this requirement, EPA did not even attempt to calculate the costs of its proposed NSPS for Total PM and SO2. Rather the agency states that "the proposed EGU NESHAP PM and SO2 standards for new EGUs are as stringent as or more stringent than the proposed NSPS amendments, and we have concluded that there are *no costs or benefits associated with these amendments*."[132] This rationale fundamentally distorts the requirements of the CAA and is arbitrary and capricious.

Moreover, this failure is even more disconcerting considering that EPA's own benefits analysis clearly states that the Utility MACT rule has little to do with the HAPs at issue, but rather creating a regulatory backstop for reducing ambient concentrations of particulate matter. Simply stated, EPA has inappropriately conducted dual analyses of these proposed regulations. It has justified the Utility MACT rule, which does not permit consideration of costs in setting the MACT floor, by claiming co-benefits from this NSPS. Yet the agency refused to conduct an independent analysis of the costs of the proposed NSPS—which is required under

[132] 76 Fed. Reg. at 25,072.

section 111. For this reason, EPA's NSPS for PM and SO2 are arbitrary and capricious and contrary to the CAA.

VII. EPA SHOULD EXERCISE ITS DISCRETION TO PROPERLY TAILOR THIS RULE

Both the text of the CAA and its legislative history grant EPA considerable discretion to establish alternative forms of emissions control narrowly tailored to substantially reduce the burden of regulation while still achieving the desired health results. At each opportunity throughout the proposed rule, EPA declined to exercise this discretion primarily to preserve the benefits attributable to regulating criteria pollutants. This rationale is not permitted by the CAA. Accordingly, NMA urges the agency to reevaluate its commitment to the Franken-MACT approach to regulating HAP emissions from EGUs.

A. EPA Should Develop Health Based Emissions Standards for Acid Gases

Congress provided EPA with valuable regulatory flexibility under section 112(d)(4) to match the stringency of a HAP emission limitation to the level determined necessary to fully protect human health. The consequences of EPA's defective HAP-by-HAP standard setting approach highlights the need for a legislative backstop to ensure the emissions standards are no more stringent than necessary. Indeed, the legislative history of section 112(d)(4) supports this notion by stating, "[f]or some pollutants a MACT emissions limitation may be far more stringent than is necessary to protect public health and the environment."[133] Consequently, health based emissions standards provided an alternative regulatory mechanism for HAPs "where health thresholds are well-established…and the pollutant presents no risk of adverse health effects, including cancer…."[134] EPA should uphold the commitment from President Obama to eliminate unnecessary and inefficient regulation by promulgating health-based standards.

Based on EPA's inhalation risk analyses, the agency has the factual basis to develop health based emissions standards for acid gases as none of those HAPs are listed as carcinogenic and have defined health thresholds. As described above, EPA has estimated hazard quotients ("HQ") for these HAPs and determined that if an HQ is below 1.0 a health based standard may be set in lieu of a MACT standard. The agency reports that the HQ for HCl never exceeded 0.05 in any of its risk assessments—or values that are 20 to 200 times lower than the RfC for HCl.[135] In other words, for EGUs the predominant HAP in the acid gas MACT sub-group has a maximum risk that is only 5 percent of the level considered protective of health with an added safety buffer.

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133 S. Rep. No. 101-228 (1990) at 171.

134 *Id.*

135 76 Fed. Reg. at 25,051 n. 170.

Despite this information, the agency cites its regulatory authority under section 112 but claims that it does not have the requisite information to do so. "In the case of this proposed rulemaking, we have concluded that we do not have sufficient information at this time to establish what the health-based emissions standards would be for HCl or the other acid gases from EGUs alone, much less for EGUs and other sources of acid gas HAP located at or near facilities with EGUs."[136] This argument is unpersuasive. Given the amount of time and resources the agency has expended collecting data from EGUs as evidenced by the foregoing risk analysis, there is little reason to believe that the agency, in conjunction with groups like EPRI or UARG, could not develop a practical solution to this issue.

Furthermore, the agency does have the technical tools and expertise to set § 112(d)(4) standards for acid gases as evidenced by the first round of industrial boiler MACT rulemakings in 2004. Those health based standards represented a win for both industry and the environment. EPA has also created regulatory precedence for addressing HCl as a threshold pollutant in promulgating the Pulp and Paper NESHAP (1998) and the Lime Manufacturing NESHAP (2002) where the agency wholly exempted HCl from the MACT requirement. Unfortunately, EPA seems unwilling to support such a common-sense approach.

Closer examination of the record, however, makes it seem unlikely that the absence of information or lack of technical expertise is the real driver in the agency's decision to not exercise its discretion. The interagency comments provide useful insight into the agency's intent. These comments note EPA's reluctance to develop § 112(d)(4) standards due to the agency's overreliance on the co-benefits derived from PM2.5 to fully support the benefits analysis.[137]

Citing the loss of co-benefits from criteria pollutants is not a permissible use of discretion. Section 112(d)(2) provides an express list of factors EPA may consider in setting § 112(d) standards—including "the cost of achieving such emission reductions, and any non-air quality health and environmental impacts and energy requirements." Noticeably absent from this list is consideration of non-HAP air quality benefits, such as the co-benefits of reducing PM2.5 emissions. The restriction evinces clear congressional direction that the agency should not consider non-HAP air quality benefits in setting standards under § 112(d). Furthermore, the D.C. Circuit also rejected such a practice holding that Section 112 "prohibits the addition of any criteria pollutant to 'the list' of HAPs, with a single exception for certain precursor pollutants not relevant for this case. This prohibition extends of necessity not only to rules that literally list a criteria pollutant as a HAP but to any rule that in effect treats a criteria pollutant as a HAP."[138] Therefore, EPA's failure to set § 112(d)(4) standards based on this rationale runs counter to the CAA.

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136 76 Fed. Reg. at 25,051.

137 Interagency Comments at 8.

138 *Nat'l Lime Ass'n v. U.S. EPA*, 233 F. 3d 625, 638 (D.C. Cir. 2000).

B. EPA Should Subcategorize to Ensure all Coals Meet the Proposed NESHAPs

Section 112(d)(1) provides the agency discretion to distinguish "among classes, types and sizes of sources within a category or subcategory in establishing standards." Under section 111, the agency has set prior regulatory precedence for subcategorizing coal-fired power plants based on the sulfur levels of the type of coal burned.[139] This approach was subsequently validated by the D.C. Circuit in *Sierra Club v. Costle*.[140] The Court observed that "[o]n the basis of this language alone, it would seem presumptively reasonable for EPA to set different percentage reduction standards for utility plants that burn coal of varying sulfur content."[141] Therefore, the Court determined that the agency could create subcategories based on the type of fuel burned.

Indeed, EPA explicitly acknowledged the need for subcategorization based on coal ranks in CAMR. The agency stated, "EPA continues to believe that it has the statutory authority to subcategorize based on coal rank and process type, as appropriate for a given standard."[142] Here the agency recognized the need to subcategorize based on coal rank by providing separate emissions standards for lignite. While NMA is supportive of EPA's decision to subcategorize for lignite, the agency needed to further subcategorize especially given the stringency of the proposed acid gas standard.

In the proposed rule, EPA declined to further subcategorize beyond lignite because "the data did not show any difference in the level of HAP emissions."[143] Based on the information EPA provided to UJAE, however, emissions data demonstrate that the proposed acid gas standard will in fact create differences in the level of emissions. Thus, without further subcategorization the proposed rule will fundamentally discriminate between coal types. [144]

UJAE stated in its comments that many well-controlled units—those with scrubbing technology—will not meet the acid gas standard burning higher sulfur coals.[145] EPA should have developed an alternative SO2 standard that takes fuel

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139 40 C.F.R. § 60.43a.

140 657 F.2d 298 (D.C. Cir. 1981).

141 *Id.*

142 70 Fed. Reg. 28,606, 28,612 (May 18, 2005).

143 76 Fed. Reg. at 25,037.

144 *See* Comments of the Unions for Jobs and the Environment ("UJAE"), EPA-HQ-OAR-2009-0234-16469, July 8, 2011.

145 *Id.*

sulfur content into account through subcategorization. For example, a standard could be set for units burning higher-sulfur coals such as 2.0 percent and higher, with a lower standard for units consuming lower sulfur coal. Additionally, EPA should seriously consider subcategorizing the HCl standard based on coal chemistry (e.g., Cl or S) to ensure that well-controlled units equipped with scrubbers and SCRs can meet the proposed standard.

Acting on this recommendation is supported by the record and better aligns with the agency's position in CAMR. EPA stated in CAMR,"[a]t some point in the future, the performance of control technologies on Hg emissions could advance to the point that the rank of coal being fired is irrelevant to the level of Hg control that can be achieved…."[146] While controls for mercury emissions have arguably reached this point based on the proposed MACT standard, this is not the case for acid gas control for higher sulfur coals. If a well-controlled unit burning higher sulfur coals cannot meet the standard, EPA needs to revise accordingly through further subcategorization to ensure that all coals are able to meet the applicable standards.

Furthermore, without further subcategorization the economic impacts on individual Midwestern states will be particularly acute as huge segments of the U.S. coal reserve will be disenfranchised by this rule. EPA did not even attempt to legitimately analyze this issue. Thus, agency's proffered rationale for declining to further subcategorize based on the acid gas standard is belied by the record. EPA needs to better align with its previous position in CAMR and further subcategorize based on coal type.

Lastly, and returning to the beyond-the-floor measure for lignite, EPA's measure for that coal type must be revised. The proposed height-to-depth ratio as part of that definition would exclude some existing lignite boilers in multiple states. EPA should therefore remove the height-to-depth ratio from the definition of "units designed for coal < 8,300 Btu/lb." Furthermore, consistent with the comments in Part III above, EPA only utilized emissions data from two units to set the floor for this subcategory within the top 12 percent for all three MACT subgroups. As a result, and inconsistent with the direction in section 112(d)(3), EPA's proposed standard represents limits achieved by the top 0.5% of existing sources. EPA must use—at a minimum—five units to set a MACT floor. Failure to do so renders this determination inconsistent with the CAA.

C. EPA Should Promulgate GACT Standards for Area Sources

Section 112(d)(5) authorizes the agency to issue standards or requirements that provide for the use of generally available control technologies ("GACT") or management practices in lieu of the traditional MACT standards for area sources. The CAA defines area sources as those that emit or have the potential to emit less than 10 tons per year of any single HAP and 25 tons per year for all HAPs. Congress recognized that the risks posed by HAP emissions from area sources were

[146] 70 Fed. Reg. at 28613.

far less than emissions from major sources warranting less stringent rulemaking standards. Therefore, EPA should reconsider and promulgate GACT standards for area sources.

Many EGUs owned by small public power or municipal utilities fall within the definition of an area source. Some of these units are small (less than 100 MWs) and pose relatively low risk to public health. Furthermore, many units have installed control technology or employ fluidized bed technology to reduce emission levels to the point of meeting the area source definition. Like the health based standards issue, EPA recognizes its discretion to set GACT for area sources but declines based on suspect rationale. The proposed rule states, "EPA believes the standards for area source EGUs should reflect MACT, rather than GACT, because *there is no essential difference between area source and major source EGUs with respect to emissions of HAP*." [147]

This argument misses the mark. If the overall issue underlying this rulemaking is protection of public health, then the relative size of the EGU should make little difference. Units that emit such small amounts of mercury present little, or no, risk to public health. In fact, EPA conceded as much when it noted that approximately 390 of the smallest emitting coal-facility units account for less than 5 percent of the total mercury emissions.[148] Regardless of whether this is a product of the unit's size or due to the benefit of advanced control technologies, these sources should not have to wade through regulatory uncertainty simply because the agency does not want to engage in the analytical rigor necessary to make this proposed rule a little more palatable for the regulated community. Instead, the proposed rule will ultimately result in a huge burden on the smallest units, many of which are owned by public power producers, impairing electric reliability and affordability for little environmental benefit.

VIII. EPA SHOULD PROVIDE THE MAXIMUM AMOUNT OF TIME TO COMPLY WITH THIS RULE

Coal-fired EGUs currently face a daunting array of air quality requirements. These requirements are often duplicative, inefficient, and create considerable uncertainty for an industry that is providing the country with one of its most crucial resources—safe, affordable and reliable power generation. The command-and-control regulatory regime being proposed is no exception to this labyrinth of regulation. Therefore, NMA requests EPA to provide the greatest amount of flexibility afforded to it under the Clean Air Act to comply with the proposed rule.

While NMA is mindful of EPA's recognition that existing sources need to be "provided up to 3 years to comply with the final rule; [and] if an existing source is unable to comply within 3 years, a permitting authority has the discretion to grant such a source an extension up to a 1-year extension on a case-by-case basis, if

147 76 Fed. Reg. at 25,021 (emphasis added).

148 69 Fed. Reg. at 4,699.

such additional time for the installation of controls,"[149] the agency is strongly encouraged to exercise its discretion and provide that fourth year to utilities without exception. The three-year compliance window is simply insufficient for designing, financing, procurement, permitting, constructing, and process startup testing the applicable universe of needed control technology installations.

There is regulatory precedent for the agency providing a fourth-year blanket exception. In the preamble to the Marine Tank Vessel Loading MACT rule, which only impacted 20 marine terminals, the agency stated, "…[t]he Agency agrees with the commenters that many MACT sources would probably require 1-year waivers if there was a 3-year compliance date for MACT sources in the final rule…Therefore, the Agency believes that the sources controlled under section 112 … should automatically receive a waiver of 1 year that will allow a total of four years from September 19, 1995 to comply with the MACT emission reduction requirements."[150] EPA should follow this precedent and eliminate doubt that a source can receive the additional year to comply as the Utility MACT rule and the IB MACT rule will impact more than 2,000 coal-fired boilers.

In addition, the agency needs to begin working with the White House, DOE, NERC and other stakeholders to investigate the discretion afforded by the Presidential Exemption under section 112(i)(4), which authorizes the President to exempt any stationary source form compliance with the MACT standards for a period of not more than two years. EPA needs to conduct this due diligence because it has failed to properly calibrate both the type of needed technology and the process utilities employ in developing and implementing a compliance program.

As mentioned previously, this proposed rule looks markedly different even optimistically assessing the market penetration for DSI. Adding at least another 26 GW of scrubbers to the already projected amount within three-to-four years will assuredly create construction and permitting bottlenecks, electric reliability issues and a myriad of other issues as detailed by UARG without additional, up-front decision-making time.[151] Furthermore, Administrator Jackson's ill-founded assumption that "over 50 percent of the power generation fleet" has no further need to retrofit to meet the demands of this proposed rule will add another layer of existing units that will need to update or retrofit scrubbing technology. Lastly, EPA has overlooked the interrelated nature of the now numerous coal-centric CAA rules. The IB MACT rule alone will cause more than 900 industrial coal boilers to compete with EGUs for retrofit technology during this same time period. These three

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[149] 76 Fed. Reg. at 25,054.

[150] 60 Fed. Reg. 48,388 (Sept. 19, 1995).

[151] UARG estimates that 48 months are needed to install a single scrubber at a large unit; 50 months to install a single scrubber at a small unit; 51 months to install two scrubbers at a facility; and 54 months to install three or more scrubbers at a facility. Additionally, it will take an estimated 5.5 years for 90 percent of units that need to install fabric filters.

examples reinforce the need for additional compliance time based on EPA's miscalculation of the type of needed technology.

Moreover, despite EPA's declarations that utilities routinely engage in forward planning, the fact of the matter is that these retrofits require time and careful planning. This planning does not happen in a vacuum, but rather as part of an interconnected grid where work at one plant can affect energy supplies across an entire region. EPA also portrays utilities as largely autonomous, while in investor-owned utilities and some cooperative and publically-owned utilities must involve public service commissions in their decision-making, and publically-owned utilities must often undertake public decision-making processes. This cannot happen while the rule is subject to change due to comments submitted by the public. EPA's reluctance to acknowledge these facts provide another example of the agency trying to have it both ways—on the one hand, EPA attempts to refute EGU's, like AEP, compliance plans as speculation based on a proposed rule, but in the same breath places the onus on industry to immediately develop compliance plans based on that same proposal.

Additionally, the agency's position that utilities possessed the foreknowledge for the past decade that existing sources would be subject to the requirements of the proposed rule is historically inaccurate. Beginning with Administrator Browner's "necessary and proper" finding for mercury, utilities may have reasonably predicted some form of mercury control, but there is no factual basis to conclude that a utility would have foreseen compliance with multiple MACT standards. The subsequent 2005 Revision reinforced EPA's approach that only mercury would be regulated under some provision of the CAA. These historic precedents drastically differ from the rule being proposed by the agency. As such, utilities and their regulators would not have authorized spending billions on speculative outcomes.

Taken together, EPA's miscalculations and over simplifications require the full amount of time afforded by the CAA to comply with the proposed rule.

CONCLUSION

Based on the foregoing, it is abundantly clear this rule will severely harm economic growth, drive up energy costs and curtail employment for little environmental gain. In EPA's haste to complete this rule, the agency has developed a proposal infected with numerous miscalculations so as to prevent meaningful comment. Specifically, the development of a rule that does not practically consider further development of one of the country's most critical and abundant natural resources to offset the loss of early retirements is unwise and stunningly short-sighted. NMA respectfully requests EPA withdraw the current proposal and re-propose a rule that is properly tailored to achieve a win for both the environment and the economic well-being of this country.

Keyword Search Go

United States Senator Lisa Murkowski

Wednesday August 03 2011

Murkowski: FERC Responses Raise New Concerns About Reliability

WASHINGTON, D.C. - Sen. Lisa Murkowski, R-Alaska, today said she remains concerned about the impacts that new regulations by the Environmental Protection Agency could have on the reliability of the nation's power grid.

In May, Murkowski asked the Federal Energy Regulatory Commission, which is responsible for reliability, to explain how the commission is working to ensure that EPA's new regulations do not adversely affect reliability. FERC's responses, which arrived Monday in the form of three separate letters from different members of the commission, prompted the following response from Murkowski:

"EPA's rulemakings could have a serious impact on the affordability and reliability of our nation's energy supply, especially given the sheer number of new regulations the agency has rolled out in such a short time period.

"I was somewhat reassured last year when Chairman Jon Wellinghoff outlined plans for an interagency task force to address this important issue. Although I was concerned about the transparency of that effort, I was hopeful it would provide FERC with an opportunity to inform the rulemaking process through a thoughtful and thorough analysis of potential consequences.

"In May, I sent a letter to FERC seeking to clarify its collaboration with EPA on regulations that could force the shutdown of a significant portion of the nation's coal-fired electricity fleet. I asked a number of questions to determine whether the commission was doing its part to monitor and protect electric reliability in this turbulent regulatory landscape. Having received FERC's responses this week, I must say that I am now less confident of that being the case.

"The commission's staff has preliminarily estimated that up to 81 gigawatts of existing generation are 'likely' or 'very likely' to be retired as a consequence of new EPA rules. That's nearly 8 percent of our installed capacity for electric generation and a retirement at that scale could have drastic consequences for many parts of our country.

"Equally concerning is FERC's admission that it has not completed a full reliability study - only an informal, preliminary analysis. There is no indication that FERC plans to press ahead and complete such a study. Instead, Chairman Wellinghoff's letter suggests that 'the planning processes used by utilities to identify and plan for the infrastructure and resources they will need are the most appropriate vehicles for this analysis.' If this is true, more time will be required to complete such planning processes.

"I continue to believe that FERC is in a good position to provide the information needed to answer these questions, but it's highly unlikely that it could be possible under the timeframe EPA

has established for its regulations. We must ensure that FERC is able to weigh in on any reliability concerns that arise, and we must be sure that the information in these letters and anything else that emerges can be made a part of the record on EPA's rulemakings."

Murkowski said FERC's responses ultimately raise more questions than they answer, including:

Should utilities or FERC be responsible for reliability analyses, and when will those analyses be completed?
Why has FERC not conducted its own formal study or sought to have utilities complete that work, especially in light of EPA's aggressive regulatory schedule?
Why did FERC opt to proceed informally in light of the seriousness of the matter and its impact on matters within the Commission's jurisdiction?
Is it possible to definitively state that reliability is not jeopardized by EPA's rulemakings?
What process will facilitate access to information that FERC says it currently lacks?

Copies of the FERC Commissioners' letters to Sen. Murkowski are attached, as is her original letter to FERC.

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Related Files:

- FERC Spitzer response 8-1-11.pdf (114.8 KBs)
- FERC Moeller response 8-1-11.pdf (706.5 KBs)
- FERC Chairman response 8-1-11.pdf (1.4 MBs)
- 05.17.11 Senator Murkowski letter to Chairman Wellinghoff.pdf (1.2 MBs)

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FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D. C. 20426

August 1, 2011

The Honorable Lisa Murkowski
Ranking Member
Committee on Energy and Natural Resources
Dirksen 304
United States Senate
Washington, D.C. 20510

Dear Senator Murkowski:

Thank you for your May 17, 2011 letter regarding the potential reliability implications of the Environmental Protection Agency's ("EPA") proposed rules and any work that the Federal Energy Regulatory Commission ("Commission") may have undertaken in this area.

As described in the attached documents, Commission staff made an informal assessment of the reliability impacts of the proposed rules, but they have not conducted any full studies for a variety of reasons. First, it is important to note that staff's informal assessment necessarily included assumptions of what the EPA regulations would require. Only one of the EPA regulations is yet final, and the informal assessment was performed before that regulation was finalized, and before some of the other regulations were formally proposed.

Second, staff's informal assessments used only publicly available data. In some cases, generation retirement decisions may not even have been made by the generation owners. Consequently, an in-depth analysis could not be conducted because complete information was not available.

Third, at meetings with EPA, Commission staff emphasized that the appropriate vehicles for addressing the impact on electric reliability of the EPA rules in detail are the planning processes used by utilities to identify and plan for the infrastructure and resources they will need to meet future needs. These processes have all the necessary data and tools for such analyses. In comparison, the data and tools available to FERC are more limited. Therefore, this informal assessment offered only a preliminary look at how coal-fired generating units could be impacted by EPA rules, and is inadequate to use as a basis for decision-making, given that it used information and assumptions that have changed.

Finally, it is important to note that available data indicates that industry has added significant amounts of generating facilities when circumstances warranted.

If the Commission can be of further assistance on this or any other Commission matter, please let us know.

Sincerely,

Jon Wellinghoff
Chairman

John Norris
Commissioner

Cheryl LaFleur
Commissioner

FERC Response to Senator Murkowski
Proposed EPA Rules

1. With respect to the impact on electric reliability of the listed EPA rules affecting generation of electric power, please list and describe the Commission's actions taken; studies conducted; assistance provided to any other agency, including EPA; collaborative efforts with any other agency; and provision of data to any other agency.

Answer: *Commission staff and individual Commissioners have consulted with EPA and other agencies. Also as described below, the Commission has not conducted any full studies on the EPA rules, but Commission staff has made an informal assessment of the reliability impacts of EPA's rules (copy provided).*

Limited Scope of Commission Staff's Informal Assessment

At meetings with EPA, Commission staff has emphasized that the appropriate vehicles for addressing the impact on electric reliability of the EPA rules in detail are the planning processes used by utilities to identify and plan for the infrastructure and resources they will need to meet future needs.[1] *These processes have all the necessary data and tools for such analyses. In comparison, the data and tools available to both EPA and FERC are more limited. Commission staff has also identified relevant issues that can and should be addressed within these processes. Further, staff's informal assessments used only public data.*

It is important to note that staff's informal assessment necessarily included assumptions of what the EPA regulations would require. Only one of the EPA regulations is yet final, and staff's informal assessment was performed before certain of the regulations were proposed. On this point, a June 2011 report issued by staff of the Bipartisan Policy Center concluded that:

> *scenarios in which electric system reliability is broadly affected are unlikely to occur. Previous national assessments of the combined effects of EPA regulations reach different conclusions, in part because they make quite different assumptions about the stringency and timing of new requirements and about the availability and difficulty of implementing control technologies. In some cases these assumptions deviate from the specifics of EPA's recent proposals in meaningful ways. Moreover, market factors, such as low natural gas prices, are as relevant as EPA regulations in driving coal plant retirements.[*[2]*]*

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[1] The planning authorities include, but are not limited to the Midwest Independent Transmission System Operator, PJM Interconnection, LLC, the California Independent System Operator, and Tennessee Valley Authority.

[2] Bipartisan Policy Center, Staff Paper: Environmental Regulation and Electric System Reliability (June 13, 2011).

This statement is equally true of staff's informal assessment. As noted, Commission staff's informal assessment was based on information that was publicly available at the time it was conducted and included assumptions regarding the potential EPA rules that have changed during the EPA rulemaking process and may continue to change. While that informal, preliminary assessment showed 40 GW of coal-fired generating capacity "likely" to retire, with another 41 GW "very likely" to retire, an in-depth analysis could not be conducted because complete information was not available. In performing the informal assessment, Commission staff chose certain factors to consider, such as SO_2 controls, age of the plant, and whether the plant owner had already announced plans to retire the plant. Commission staff then decided to weight each factor. As these inputs to the informal assessment have changed, projected outcomes would necessarily change. Therefore, this informal assessment offered only a preliminary look at how coal-fired generating units could be impacted by EPA rules, and is inadequate to use as a basis for decision-making, given that it used information and assumptions that have changed.

Commission staff's informal assessment of the proposed EPA regulations was performed based on assumptions of what the EPA regulations might require. For example, similar to other national studies performed at the time, staff's informal assessment assumed that the steam generating units employing once-through cooling systems could be required to replace their cooling water systems with closed-loop cooling systems.[3] *However, EPA states that under its proposed rules, closed-loop cooling systems are not required of existing facilities and that "in meeting the impingement requirement that a limited number of fish be killed by a facility, the facility would determine which technology to employ to meet the impingement limit."*[4]

Consultations

Commission staff has had numerous consultations with EPA concerning its proposed power sector rules. Staff also has participated in meetings attended by the Council on Environmental Quality (CEQ), Department of Energy, and the EPA. Each consultation generally concerned a single proposed rule, rather than the cumulative effect of all of the EPA proposed rules. Commission staff's discussions with EPA staff were primarily with EPA's air quality staff and concerned EPA's air quality rules.

Commission staff discussions with EPA and other agencies generally concerned the EPA's analysis of its various upcoming rules – particularly their effects on power plants and grid reliability. At some of these meetings, outside studies as well as FERC's and EPA's assessments of the impacts of the individual potential EPA rules were discussed. The agencies discussed the underlying approach to EPA's analysis and potential limitations of the analysis, and next steps.

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[3] *See, e.g.* NERC Assessment at 2.

[4] EPA, Clean Water Act Section 316(b) Existing Facilities Proposed Rule: Qs and As (March 28, 2011).

In a meeting with EPA and CEQ at Commission Headquarters on October 27, 2010, Commission staff discussed the results of its informal assessment of projected coal generation retirements, which included an explanation of the assessment's methodology. As discussed above, this informal assessment had several limitations. The informal assessment of reliability impacts was based on information that was publicly available at the time it was conducted and included assumptions regarding the potential EPA rules that have changed during the EPA rulemaking process and may continue to change. While that informal, preliminary assessment showed 40 GW of coal-fired generating capacity "likely" to retire, with another 41 GW "very likely" to retire, an in-depth analysis could not be conducted because complete information was not available. In some cases, generation retirement decisions may not even have been made by the generation owners. In performing the informal assessment, Commission staff chose certain factors to consider, such as SO2 controls, age of the plant, and whether the plant owner had already announced plans to retire the plant. Commission staff then decided to weight each factor. As these inputs to the informal assessment have changed, projected outcomes would necessarily change. Therefore, this informal assessment offered only a preliminary look at how coal-fired generating units could be impacted by EPA rules, and is inadequate to use as a basis for decision-making, given that it used information and assumptions that have changed. This assessment was not transmitted to the EPA or CEQ either in paper form or electronically. EPA and CEQ staff questions centered on the amount of generation that might be affected, its impact on the reliability of the power grid, the methods by which the data was acquired, the weighting of the factors, and the basis used for conclusions on which units would be considered at-risk for retirement.

Commission staff, CEQ and EPA also discussed the effect of planned and needed new generation to compensate for the reliability impacts of retirements, the ability of such new generation to come online before the retirement of coal units is expected to begin between 2015 and 2018, the deliverability of new generation, the issues regarding single-source fuel dependencies, and finally which EPA regulations were most likely to be implemented within the near future.

In subsequent discussions with EPA, Commission staff discussed the generation investment strategy used by the industry and why Commission staff believes that a comprehensive approach is needed when studying the impacts of the EPA rules. EPA and Commission staff discussed various scenarios concerning replacing retired generation with renewable resources, including that renewable generation may not provide a one-to-one replacement for retiring capacity given the unique characteristics of different generation types and their impact on grid stability.

In discussing whether there is enough time for new generation to come online by 2018 to offset coal retirements, Commission staff identified several factors that can extend the project build horizon. These include the long lead time needed for some equipment, potential protests against pipeline siting and construction, transmission siting and construction issues, and environmental permitting. These factors may slow the industry response in replacing retired units.

In discussions concerning the EPA efforts to model the effect these regulations could have on generation retirements, Commission staff recommended that such efforts should include the modeling of transfer limits, placement and timing of capacity additions and the cumulative impact of all the upcoming EPA regulations. Specifically, the Commission staff identified the following reliability considerations: (1) regional resource adequacy, (2) deliverability and transmission flows on the grid, (3) black start units and (4) voltage and frequency response.

Importantly, Commission staff has emphasized that the appropriate vehicles for addressing these issues are the planning processes used by utilities to identify and plan for the infrastructure and resources they will need to meet future needs.[5] *These processes have all the necessary data and tools for such analyses. In comparison, the data and tools available to both EPA and FERC are limited and incomplete.*

At least one staff discussion with EPA staff focused on Commission approved public utility tariff rules relating to generation retirements. Commission staff discussed public utility tariff requirements for reliability-must-run generation, generation retirements and related Commission decisions. Commission staff later sent EPA information detailing FERC policies and key orders that explain those policies.

In addition to the staff consultations, certain Commissioners also met with representatives from EPA. On December 17, 2010, Chairman Wellinghoff met with Administrator Jackson at EPA regarding the proposed rules. Chairman Wellinghoff also had a phone conversation with Gina McCarthy, Assistant Administrator for the Office of Air and Radiation, on the morning of October 26, 2010 to discuss NERC's report on the reliability impacts of EPA's regulations. On November 29, 2010, Commissioners Norris and LaFleur and their staffs met with Ms. McCarthy and other EPA staff. The meeting consisted of an overview and discussion of EPA's current Clean Air Act rulemaking activities. On May 3, 2011, Commissioners LaFleur and Moeller and their staffs met with Ms. McCarthy, other EPA staff, and staff from DOE. The subject matter of this meeting concerned the EPA's proposed rules and their potential impacts in terms of cost and reliability, specifically discussing the analyses that EPA has performed to try and quantify these impacts.

2. Regarding collaborative efforts between FERC and EPA described above, has an Inter-Agency Task Force been established? If so, please state or provide:

a. the date it was established;
b. the source of its authority;
c. a copy of its charter;
d. a description of the scope of its work;

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[5] Some of the larger planning authorities are the Midwest Independent Transmission System Operator, PJM Interconnection, LLC, and the California Independent System Operator.

e. a schedule of its meetings, including a list of its meetings to date and any planned meetings;
f. any minutes of its meetings; and
g. a list of the agencies and agency officials participating.

Answer: *While Chairman Wellinghoff has stated that he believed that an Interagency Task Force was being formed, he was broadly referring to the informal consultations described in response to question number 1. The Commission has not participated in any interagency task force or other working group to address the impact of EPA's proposed power sector rules. All meetings attended by Commission staff concerning the proposed rules are summarized in response to question number 1.*

3. Please describe all work being jointly performed by FERC staff, including work done in collaboration with EPA – whether in connection with an Inter-Agency task force or otherwise – regarding the potential impact of EPA regulations on the retirement of electric generating units and, to the extent such information has been developed, the specific type and characteristics of units that may face retirement as a consequence of such regulations.

Answer: *The only work performed by Commission staff is discussed above in response to question 1. Commission staff has not performed any work jointly with any other agency regarding the potential impact of the EPA regulations. As explained in response to question 4, Commission staff performed an informal assessment of projected coal generation retirements.*

4. Please describe FERC's efforts to explain the effect of potential retirements on electric reliability. If research, data, or analysis has been developed by or supplied to FERC, please provide it. If no analysis has been conducted, please explain why.

Answer: *Commission staff performed an informal assessment of projected coal generation retirements. The informal assessment was based on information that was publicly available at the time it was conducted. While that informal, preliminary assessment showed 40 GW of coal-fired generating capacity "likely" to retire, with another 41 GW "very likely" to retire, an in-depth analysis could not be conducted because complete information regarding the specific units planned for retirement is not available. In some cases, generation retirement decisions may not even have been made by the generation owners. In performing the informal assessment, Commission staff chose certain factors to consider, such as SO_2 controls, age of the plant, and whether the plant owner had already announced plans to retire the plant. Commission staff then decided to weight each factor. As these inputs to the informal assessment have changed, projected outcomes would necessarily change. Therefore, this informal assessment offered only a preliminary look at how coal-fired generating units could be impacted by EPA rules, and is inadequate to use as a basis for decision-making, given that it used information and assumptions that have changed. This assessment was not transmitted to*

the EPA or CEQ either in paper form or electronically. EPA and CEQ staff questions centered on the amount of generation that might be affected, its impact on the reliability of the power grid, the methods by which the data was acquired, the weighting of the factors, and the basis used for conclusions on which units would be considered at-risk for retirement.

5. Please describe fully FERC's powers to protect electric reliability in the event of plant retirements, and what measures FERC plans to take to ensure electric reliability or an explanation of why such measures have not been devised. Please provide the following assessments, or an explanation of why such assessments have not yet been devised:

a. an assessment of generation adequacy in the face of retirements of significant generating units in transmission-constrained areas;
b. an assessment of the effect of retirements of generating units in organized markets for energy and capacity (e.g. on prices and unit commitment); and,
c. a general assessment of the capacity to permit and construct new electric generation units in a timely manner such that electric supplies form retired plants are replaced and anticipated demand growth is met.

Answer: *As discussed in response to question 4, Commission staff has only performed an informal assessment of projected coal generation retirements. The informal assessment of reliability impacts was based on information that was publicly available at the time it was conducted. An in-depth analysis could not be conducted because complete information regarding the specific units planned for retirement is not available. In some cases, generation retirement decisions may not even have been made by the generation owners.*

Commission staff believes that the appropriate vehicles for addressing these issues are the planning processes used by utilities to identify and plan for the infrastructure and resources they will need to meet future needs.[6] *These processes have all the necessary data and tools for such analyses. In comparison, the data and tools available to FERC staff are limited and incomplete. In addition, section 215 of the FPA does not allow the Commission to order new facilities to be built.*

With respect to the Commission's authority to protect electric reliability in the event of plant retirements, the Commission has acted under section 207 of the Federal Power Act to ensure reliability in a case involving the Clean Air Act.[7] *Section 207 states that "whenever the Commission, upon complaint of a State commission, after notice to each State commission and public utility affected and after opportunity for hearing, shall find*

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[6] Some of the larger planning authorities are the Midwest Independent Transmission System Operator, PJM Interconnection, LLC, and the California Independent Transmission System Operator.

[7] The answers to this question concern only the Commission's authority and do not discuss any possible DOE authority.

that any interstate service of any public utility is inadequate or insufficient, the Commission shall determine the proper, adequate, or sufficient service to be furnished, and shall fix the same by its order, rule, or regulation." Action under section 207 may only be taken after a hearing. This may consist of a paper hearing allowing for comments to be submitted to the Commission. In a 2006 decision, the Commission relied on section 207 to order two utilities to file a long-term plan for transmission upgrades to address reliability concerns raised by the possible shutdown of certain generating facilities pursuant to the Clean Air Act. District of Columbia Public Service Commission, 114 FERC 61,017 (2006). The Commission's remedy did not conflict with the requirements of the Clean Air Act, and instead reconciled the requirements of the Federal Power Act and the Clean Air Act.

FERC also has approved tariff provisions and agreements allowing system operators to require the continued operation of generating facilities so long as the owners of those facilities are reimbursed for the cost of operating, including any costs incurred in ensuring compliance with environmental rules. In Order No. 890-A,[8] for example, the Commission stated that:

> *Reliability problems caused by the lack of available resources should be dealt with through ... means, such as negotiation of must-run service agreements.[9]*

Such agreements have been used by Regional Transmission Organizations or Independent System Operators to ensure continued operation of needed facilities while ensuring appropriate compensation for the costs incurred by those units.[10]

Similarly, during the California energy crisis, the Commission required generating facilities to run whenever requested by the system operator. However, the Commission

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[8] Preventing Undue Discrimination and Preference in Transmission Service, Order No. 890, FERC Stats. & Regs. P 31,241, order on reh'g, Order No. 890-A, FERC Stats. & Regs. P 31,261 (2007), order on reh'g, Order No. 890-B, 123 FERC ¶ 61,299 (2008), order on reh'g, Order No. 890-C, 126 FERC ¶ 61,228 (2009), order on clarification, Order No. 890-D, 129 FERC ¶ 61,126 (2009).

[9] Order No. 890-A at P 950.

[10] See, e.g., *ISO-New England, Inc*, 132 FERC ¶ 61,044 (2010); *Exelon Generation Company, LLC*, 132 FERC ¶ 61,219 (2010); *PSEG Energy Resources & Trade and PSEG Fossil LLC*, 111 FERC ¶ 61,121 (2005). *See also, e.g.*, ISO-New England, tariff section III.13.2.5.2.5 (delineating the process for a de-list bid rejected for reliability reasons), PJM Interconnection, tariff section V.113 (governing the generation deactivation process), and California Independent System Operator, tariff sections 41.1 (Procurement of RMR Generation), 41.4 (Reliability Must Run Contracts) and 41.3 (Reliability Studies and Determination of RMR Unit Status).

allowed an exception for purposes of compliance with other applicable law.[11] *Again, the Commission was able to reconcile the requirements of the Federal Power Act and other laws.*

In Order No. 890, the Commission also required certain transparency provisions regarding retired generation, requiring transmission providers to make available, upon request, modeling data concerning the dates and capacities of new and retiring generation as well as new and retired generation included in models for future years. [12]

A completed application for Network Integrated Transmission Service also requires information regarding off-system network resources that include any RMR unit designations required for system reliability or contract reasons.[13] *Again, the Commission has not asserted that this authority can be used to approve violations of environmental laws. Instead, the owners of affected generating facilities were "made whole" for the costs they incurred to continue to operate.*

I do not foresee a need to require utilities to operate in violation of federal environmental laws or regulations. As it has in the past, the Commission would seek to find ways to require or allow utilities to operate when needed for reliability or other purposes while being compensated adequately and without violating other federal laws. If future circumstances present an unavoidable conflict between FERC's authority for the reliability of the power grid and requirements imposed under other federal laws, the appropriate resolution of this conflict will need to be determined at that time. Moreover, available data indicates that industry has added significant amounts of generating facilities when circumstances warranted. As a point of reference, EIA data shows that between 2000 and 2004, an annual average of 38.74 GW of capacity was added nationally, with a peak addition of 58.06 GW in 2002.

6. The Clean Air Transport Rule specifically lists ensuring electric reliability as a "key guiding principle." Please describe any research, documentation or analysis FERC has provided EPA for this rule.

Answer: *The Commission has not provided EPA with any research, documentation or analysis on the Clean Air Transport Rule, except for discussion of Commission staff's informal assessment as described above.*

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[11] *See San Diego Gas and Elec. Co.*, 95 FERC ¶ 61,115 (2001) ("Under a must-run obligation, no generator will be required to run in violation of its certificate or applicable law.").

[12] *Order No. 890* at P 148.

[13] Pro forma Open Access Transmission Tariff § 29.2.

7. Regarding the Commission's FY 2010 Performance and Accountability Report to Congress, quoted above, and the staff analysis of electric reliability impacts referenced in the quotation, please describe or provide:

a. the study and all supporting materials including research;
b. a list of any other agencies involved in the production of the study with information on their involvement
c. actions FERC has taken or plans to take based on the study; and
d. how and where the study has been made public, or why it has not been released

Answer: *As discussed in response to question 4, Commission staff performed an informal assessment of projected coal generation retirements. The informal assessment of reliability impacts was based on information that was publicly available at the time it was conducted. An in-depth analysis could not be conducted because complete information regarding the specific units planned for retirement is not available. In some cases, generation retirement decisions may not even have been made by the generation owners. This assessment has not been made public because it is an informal assessment based on available information and is not complete. Materials concerning this informal assessment are attached.*

8. In your view, would compliance with EPA or other environmental regulations excuse a violation of FERC-approved electric reliability standards? If so, should the Commission refrain from imposing penalties for these violations?

Answer: *The Commission has not seen a circumstance where compliance with EPA or other environmental regulations has caused a violation of FERC-approved electric reliability standards. As it has in the past, the Commission would seek to find ways to require or allow utilities to operate when needed for reliability or other purposes while being compensated adequately and without violating other federal laws. If future circumstances present an unavoidable conflict between FERC's authority for the reliability of the power grid and requirements imposed under other federal laws, the appropriate resolution of this conflict will need to be determined at that time.*

9. Please assess whether FERC has sufficient statutory authority to protect electric reliability in collaboration with other federal entities that are undertaking rulemakings.

Answer: *Apart from the issue of cyber security and other national security threats and vulnerabilities, I do not see a need for further statutory authority to protect electric reliability at this time.*

10. Is FERC or any other agency, to your knowledge, soliciting or relying upon advice or assistance from any entity established pursuant to the Federal Advisory Committee Act?

Answer: *No.*

APPENDIX A

Meetings with EPA

Below is a list of CEQ and EPA's Clean Air Division (EPA CAD) meetings Commission staff has attended concerning the potential retirement of coal fired generation as a result of the EPA proposed rules. Document descriptions relating to these meetings are attached as an appendix. No physical or electronic copies of FERC's data or analysis were given to EPA. EPA CAD and FERC Staff will continue to meet on an as needed basis.

September 8, 2009 12:30-4:30 PM
EPA Headquarters
Participants: staff from EPA, FERC and members from industry

Meeting to discuss EPA regulatory actions and their effect on the electric generating sector.

August 18, 2010 2:15 PM – 3:15 PM
Meeting at White House Conference Center, Jackson Place
Participants: staff from EPA, CEQ, FERC and others

The Council for Environmental Quality (CEQ) convened a meeting to discuss EPA analysis of upcoming rules affecting power plants and the impacts of the rules on costs, reliability, generation mix, etc. At the meeting, it was mentioned that several outside studies to explore this topic have been completed or are underway. CEQ said it was important for the Administration to develop analytics to provide a coherent and unified view on potential impacts.

EPA presented two alternative scenarios for the power sector, using the Integrated Planning Model (IPM), which illuminates a range of issues including retirements and reliability implications. Discussion on the underlying approach, limitations of the analysis, and next steps ensued. EPA provided an overview presentation of Clean Air Act requirements for the power sector and a timeline of upcoming EPA regulations.

September 8, 2010 2:00 PM-3:00 PM
Meeting at FERC
Participants: staff from EPA and FERC

EPA asked to visit with FERC staff to follow up on the August 18 discussion of the EPA modeling assumptions.

October 5, 2010 2:00 PM – 3:00 PM
Meeting at White House Conference Center, Jackson Place
Participants: staff from EPA, CEQ, FERC and others

CEQ arranged a meeting to discuss assessing the potential impact to the bulk power system from the proposed EPA regulations. FERC staff attended this meeting.

October 20, 2010 1:00 PM – 3:00 PM
Meeting at White House Conference Center, Jackson Place
Participants: staff from EPA, CEQ and FERC

CEQ arranged a follow-up meeting with staff from EPA and FERC to discuss how EPA and CEQ thought FERC might be able to provide perspective on an EPA analysis of the bulk power system. EPA CAD staff has been assessing potential impacts to the bulk power system that stem from implementation of proposed EPA clean air regulations over the next three years. These EPA regulations are the Clean Air Interstate Rules, now known as the Transport Rules.

EPA CAD's analysis focused only on the effects that the Transport Rules would have on the nation's electric generation capacity– specifically the reduction of coal plants. EPA CAD's analysis did not consider the cumulative impact from additional legislative initiatives, including water restrictions, coal ash byproduct sequestration or any renewable generation mandates.

The CEQ proposed that FERC staff meet with EPA CAD staff to further explore EPA CAD's assumptions, data granularity and methodology, and for FERC staff to explain the methodology of its coal generation assessment. There were differences between the results obtained by the EPA CAD assessment and FERC staff informal assessment with respect to the amounts of coal units that might shut down across the country. The overarching goal of this future meeting was to exchange information.

October 26, 2010
Chairman Wellinghoff had a phone conversation with Gina McCarthy, Assistant Administrator for the Office of Air and Radiation, to discuss NERC's report on the reliability impacts of EPA's regulations.

October 27, 2010 10:00 AM – 12:00 PM
Meeting at FERC
Participants: staff from EPA, CEQ and FERC

EPA CAD organized a meeting with FERC staff and CEQ to discuss how proposed EPA regulations that will affect coal plants might affect reliability of the grid and potential methods by which these impacts could be analyzed. Data from EPA's modeling efforts was compared with the results of FERC staff's informal assessment.

The meeting began with a presentation of the FERC staff informal assessment which included detailed explanations of the assessment and methodology used. FERC staff explained that the assessment had data limitations and was based on publicly available information and more information would be needed to have a complete assessment.

Commission staff emphasized that its informal assessment was limited in nature because it made many assumptions regarding what the pending EPA rules may or may not do. The questions asked by attendees about the FERC staff informal assessment centered on the methods by which the data was acquired, the weighting of the factors, data limitations, and the basis used for conclusions on which units would be considered at-risk for retirement.

The group then discussed the potential effect of planned and needed new generation on the reliability impacts of retirements, the ability of such new generation to come online before the retirement of coal units is expected to begin between 2015 and 2018, and finally which EPA regulations were best defined and most likely to be implemented within the near future.

The CEQ representative discussed whether nameplate capacity numbers of proposed generation would show that there would be enough capacity following the fast retirement of a sizeable amount of generation. FERC staff stated that renewable generation may not provide a one to one replacement for the capacity that is retiring given the different characteristics of the units.

The EPA CAD representative discussed timelines for new generation to come online to offset coal retirements. In response, Commission staff identified several factors that can extend the project build horizon, such as long lead time equipment, backlash against pipeline siting and construction, transmission siting and construction issues, along with other factors that could slow the market response. The EPA CAD representative concluded the discussion by stating that the Clean Air Transport Rule and Mercury MACT Rule were closer to being final than the coal combustion residuals or Clean Water Act regulations.

EPA CAD staff concluded the meeting by outlining next steps and planning future meetings for further discussion. The EPA CAD asked FERC staff to evaluate the generation data produced by the EPA CAD model and compare the units that have been predicted to retire by that model with those units designated as at-risk by the FERC staff initial assessment. In addition, they expressed a desire for FERC staff to produce system production cost runs and reliability metric studies using the generation retirement lists created by the EPA CAD model. The CEQ representative also expressed a desire for FERC staff to complete sensitivity studies regarding the major risk factors and begin evaluation of a best case scenario.

November 4, 2010 10:30 AM – 12:00 PM
Conference Call
Participants: staff from EPA and FERC

EPA CAD staff held a conference call with FERC staff as a follow up to the meeting of October 27th. The purpose of the call was to engage further discussion regarding FERC staff initial coal retirement projections, assumptions and methodology with the EPA. At that time, the EPA was only considering the Transport rule which was scheduled to take

effect in June 2011. EPA CAD staff has been seeking assistance from FERC staff in analyzing the effect on reliability of the Maximum Achievable Control Technology (MACT) rule for which they would provide further data as produced by their model in December 2010.

FERC and EPA CAD staff discussed the generation investment strategy used by the industry and the need for a cumulative approach when studying the impacts of the EPA rules.

November 29, 2010 – 2:30-4:00 pm
EPA Headquarters
Participants: Commissioners Norris and LaFleur, FERC staff, EPA: Gina McCarthy, Assistant Administrator for the Office of Air and Radiation, EPA staff

Subject: An overview and discussion of EPA's current Clean Air Act rulemaking activities.

February 10, 2011 3:45 PM – 5:00 PM
Meeting at EPA HQ
Participants: staff from EPA, CEQ, DOE and FERC

EPA convened a meeting to discuss communication strategy. Agenda for this meeting

- Introductions (5+ minutes)
- Status/Update on EPA's Rules (10+ minutes)
- Status/Update on ongoing EPA-FERC meetings (5 to 10 minutes)
- Focus on key next Rules (Toxics Rule will be proposed March 16 and Cooling Water Rule will be proposed March 14), timeline, messaging, and next steps (30+ minutes)

February 14, 2011 Lunch Meeting
Participants: staff from FERC and EPA

EPA staff contacted FERC Staff to request that EPA staff and FERC staff have lunch together during the National Association of Regulatory Utility Commissioners annual meeting. EPA and FERC staff discussed ways in which EPA staff could participate in regional transmission planning processes to monitor how utilities plan to comply with the EPA rules.

February 16, 2011 10:00 AM – 12:00 PM
Meeting at FERC
Participants: staff from EPA, CEQ, DOE and FERC

FERC staff attended a meeting with staff from the EPA CAD, DOE, and CEQ with regard to the implications of the upcoming EPA Transport and Toxics rules. The group

received a presentation of EPA modeling efforts that predicted these regulations could cause the retirement of approximately 9 GW of generation capacity. Concerns regarding the modeling of transfer limits, capacity additions and the cumulative impact of all the upcoming EPA regulations were also discussed. EPA CAD staff sought to work with FERC and DOE staff over the next several months to better identify and address issues that could affect grid reliability. Issues to be addressed included the impact of the upcoming rules on: (1) regional resource adequacy, (2) transmission flows on the grid, (3) black start units and (4) voltage and frequency.

March 14, 2011 8:00 AM – 9:00 AM
Conference Call
Participants: staff from EPA and FERC

FERC staff sat in on a conference call with EPA CAD staff regarding coal plant retirements expected as a result of announced EPA regulations. The EPA CAD staff discussed how they had retooled their analysis, slightly downgrading the amount of expected retirements as a result of the Clean Air rules. The EPA issued the proposed toxics standards on March 16 (two days after this meeting), with a final rule to be issued by November 16, 2011.

FERC staff discussed how the EPA CAD's modeling did not take into account the cumulative effect of its proposed regulations and emphasized that Commission staff does not have the ability to produce such a study. FERC staff shared the suggestion made by industry groups that the regional planning processes would be an excellent place for the EPA to receive further input regarding pending regulations effect on grid reliability. EPA CAD staff proposed to conduct bi-weekly conference calls with FERC to keep each other informed of any developments.

March 30, 2011 8:00 AM – 9:00 AM
Conference Call
Participants: staff from EPA and FERC

On March 24 the EPA released details on the proposed Clean Water Act rule. EPA staff stated that the rule was much less stringent than industry had expected. FERC staff offered to send news articles and other public information to EPA CAD staff as well as list of sources for coal retirement information.

April 4, 2011 11:30 AM – 12:30 AM
Meeting at FERC
Participants: staff from EPA and FERC

At the request of EPA staff, FERC staff met with EPA staff regarding FERC approved public utility tariff rules relating to generation retirements. FERC staff discussed public utility tariff requirements for reliability-must-run generation, generation retirements and related Commission decisions. FERC staff followed-up with a reply email detailing FERC policies and key orders that explain those policies.

April 13, 2011 8:00 AM – 9:00 AM
Conference Call
Participants: staff from EPA and FERC

EPA provided FERC staff a study which was intended to forecast which coal fired power generation units will be retrofitted or retired by 2015 as a result of EPA's recent proposal for Maximum Achievable Control Technology (MACT) standards for hazardous pollutants on electric utility emissions. FERC staff noted EPA modeling inconsistencies and provided information on publicly announced retirements and retrofits that were not taken into account on the EPA study.

April 27, 2011 8:00 AM – 9:00 AM
Conference Call
Participants: staff from EPA and FERC

EPA CAD and FERC staff discussed the EPA's modeling of the EPA's Utility MACT Rule (Toxics Rule). The EPA discussed questions, industry studies and recent retirement announcements that may concern the proposed Toxics Rule. To more fully evaluate industry concerns, FERC staff suggested that the EPA follow up on earlier suggestions to engage in the regional planning process with entities such as PJM, MISO and SERC. FERC and EPA agreed to meet in mid-June to assess any further developments from NERC, regional processes or comments submitted to the EPA.

May 3, 2011
Commissioner LaFleur, Commissioner Moeller, and members of their staffs met with Gina McCarthy, Assistant Administrator for the Office of Air and Radiation, and staff from EPA, along with staff from the DOE.

The subject matter of this meeting concerned the EPA's proposed rules and their potential impacts in terms of cost and reliability, specifically discussing the analyses that EPA has performed to try and quantify these impacts.

APPENDIX B

Files and Data Received From and Shared with EPA

Below is a list of files and data received from and shared with EPA CAD. **No physical or electronic copies of data or quantitative analysis were given by Commission staff to EPA.** Commission staff shared with EPA CAD some questions regarding the IPM model and its results. This is reflected in the April 21, 2011 entry.

General Data

- Coal Retirement Effects on Reliability Final.pptx- This was a presentation prepared regarding FERC's initial analysis of the potential impacts of the upcoming EPA regulations.

Commissioner Cheryl LaFleur

- Cheryl LaFleur.pdf- This contains e-mail correspondence between Commissioner LaFleur's staff and EPA staff.
- EPA Addressing the Environmental Impacts of the Power Sector.pdf – This document was presented to Commissioners LaFleur and Moeller.
- NREL Coal Study.pdf – This is a study done by NREL to analyze potential coal plant retirements due to EPA regulations.
- EPA Reducing Pollution from Power Plants – This presentation was given at the November 29, 2010 meeting with Commissioners Norris and LaFleur.

Michael Bardee

- Michael Bardee.pdf - This contains e-mail correspondence regarding a meeting organized by EPA staff.
- Email.pdf- This contains e-mail correspondence by EPA staff, inviting FERC staff and industry representatives to a meeting.

E-Mails to EPA

Questions and comments

- Database Questions Response.docx - This is the EPA CAD's response to questions they received from OER Staff regarding the IPM model and its results. The file also contains the questions asked by FERC.
- FW Responses to Your Questions.msg – E-mail correspondence regarding the EPA's modeling efforts.
- Re These are some of the questions.msg – E-mail correspondence regarding the EPA's modeling efforts.
- These are some of the questions.msg – E-mail correspondence regarding the EPA's modeling efforts.

Announcements and studies shared with EPA

- (WF) Are Coal And Nuclear Pains Gas' Gains.msg – E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- CITI Report.msg – E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- Coal Retirement Announcements.msg – E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- Dominion plans to sell Kewaunee.msg – E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- EPA rules.msg – E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- FirstEnergy prioritizing.msg – E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- Future of FirstEnergy.msg– E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- FW (CITI) Notes from Management Meeting.msg– E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- FW Macquarie - Utilities and merchant power.msg– E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- Gregoire Signs TransAlta Bill.msg– E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- ICF International Integrated Energy Outlook.msg– E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- LG&E and KU plan to retire about 800 MW.msg– E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- Morris 5 480 MW of AEP coal capacity.msg– E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- Southern's Fanning talks EPAl.msg– E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- UBS Utilities.msg– E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.

Data received from and shared with EPA

August 18, 2010

- EPA Key Preliminary Results from Modeling Future Utility Controls Aug 18.pdf – This is a presentation given by the EPA discussing the results of the IPM modeling of changes in the generation mix.

October 27, 2010

- Coal Retirement Effects on Reliability EPA CEQ Meeting 1.pptx - This is a presentation that was gone through during the meeting to give a brief

background on the work being done at FERC. **This contains maps of at-risk units and OER retirement estimates.**

- Comparison of EPA and OER.xls - This chart contains charts showing the scores assigned by the OER assessment to the plants under consideration in the EPA's model. **The chart contains all modeling data from the OER's assessment of coal generation and the EPA's output.**
- EPA Model Data – Parsedfile_TR SB Limited Trading 2014.xls - This is the output from the EPA's IPM program based on inputs for the Transport rule. This contains only the "policy case" output.
- Coal Retirement Reports DEA.xls - This is a comparison of the levels of capacity that are predicted to retire under currently released studies. It includes estimates from both FERC and the EPA as well. **This contains NERC and OER reserve margin and capacity estimates.**
- NERC and OER Reserve Margin Comparison.xls - This contains charts of the impact the retirement of at-risk capacity as estimated by both OER and NERC would have on regional reserve margins. **This contains NERC and OER reserve margin and capacity estimates.**
- Planned Capacity Projects.xls - These charts show planned capacity additions by year overlaid with OER retirement estimates. **This contains estimated at-risk capacity from the OER assessment.**
- Retirement and Construction Data.xls - These charts show both planned capacity and planned retirements by year. **It also contains estimated at-risk capacity that could be retired from the OER assessment.**

February 16, 2011

- FERC Potential Assistance if required.docx - This is a file that was received from the EPA detailing ways in which FERC staff could assist the EPA CAD in their analysis including reviewing retirement estimates and modeling, regional resource adequacy, transmission congestion, voltage issues, frequency response issues and impacts to black start units.
- FERC-DOE_Review.docx - This file lists EPA CAD's suggested ways in which DOE and in particular FERC could assist the EPA CAD staff with analysis efforts which would include reviewing retirement estimates and modeling, regional resource adequacy, transmission congestion, voltage issues, frequency response issues and impacts to black start units.
- ParsedFile_BC_24.xlsx - This is the output from the EPA CAD's IPM program based on inputs for the Transport rule and the Toxics rule. This contains only the "policy case" output.
- ParsedFileDescription.docx - This contains details and information on each of the columns and data types included in the "policy case" output.
- Resource Adequacy and Reliability_v3.docx - This report details the EPA CAD's analysis regarding potential impacts to reliability due to the retirement of capacity predicted by IPM.

- Toxics and TR Closures-134 CAMD Units Heat Inputs-Feb 15 2011.xlsx - This contains unit specific data on those units considered to be at-risk in the EPA's model.

April 4, 2011

- Base Case.xls - This is the output of the "base case" of the EPA CAD's modeling efforts.
- Policy Case.xls - This is the output of the "policy case" of the EPA CAD's modeling efforts.

April 4, 2011 Carlson

- EPA RMR Gen Retire Inquiry(3) - Memo detailing FERC Reliability Must Run policies and key orders that explain those policies.

Files prepared for initial staff assessment

- OER Screening Tool.xls- This contains a tool by which FERC was able to make an initial estimate of what the potential impacts of upcoming EPA regulations may be.
- Coal Retirement Effects on Reliability Final.pptx- This was a presentation prepared regarding FERC's initial analysis of the potential impacts of the upcoming EPA regulations.

Additional spreadsheets and charts

- EPA Analysis.xls- This contains charts and an analysis of the output from the EPA's IPM modeling efforts for the Toxics Rule.
- Maps for at Risk Units.doc- This contains maps of several regions with units designated as at-risk for retirement by the Screening Tool developed by FERC.
- PROMOD Results.xls- This contains the analysis of a PROMOD study done of the potential impact of the upcoming EPA regulations and capacity retirements in PJM.
- Regional Data on Coal Retirement and NERC Report Comparison.xls- This file contains charts and analysis comparing estimates from initial FERC analysis with the results of NERC's study of the impact of the upcoming EPA regulations.
- Review of EPA Data.doc- This file contains analysis of the output from the EPA's IPM modeling efforts for the Toxics Rule.
- Slides Using New Data.ppt – This contains updated slides for the presentation on the potential impacts of the upcoming EPA regulations.
- Upcoming and Retiring.doc- This file contains charts comparing the amount of capacity expected to be retired and constructed in each NERC region through 2020.

Summaries

- April 27 Meeting.doc- This file contains a summary of the meeting attended by FERC and EPA staff on April 27th.
- Comparison and Summary of ParsedFile.doc- This file summarizes the results from the initial IPM run completed by the EPA and shared with FERC on October 27th.
- February 16 Meeting.doc- This file contains a summary of the meeting attended by FERC and EPA staff on February 16th.
- Meeting to Review Coal Retirements and EPA Regulations.doc- This file contains a summary of the meeting attended by FERC and EPA staff on October 27th.
- New Air Pollution Transport Rule.doc- This contains a summary of the new information released by the EPA regarding the Clean Air Transport Rule.
- November 4 Meeting.doc- This file contains a summary of the meeting attended by FERC and EPA staff on November 4th.

Outside reports and summaries

- Bernstein Coal Ash Report Summary.doc- This file contains a summary of the *Bernstein Report on EPA Proposal for Coal Ash Regulation* completed on May 5th.
- Citi 2010 Overview of Major Upcoming EPA Environmental Policies 012710.pdf – This is a study completed by Citi regarding the impact of EPA regulations on coal generation.
- Citi Power, Gas, Coal & Alt Energy Conference 060810.pdf - This is an updated analysis completed by Citi regarding the impact of EPA regulations on coal generation.
- Citi Proposed Coal Ash Rules Look Light; Dirty Power Positive 050510.pdf - This is an updated analysis completed by Citi regarding the impact of EPA regulation of coal ash on coal generation.
- CS Report Analysis 2.doc- This file address questions raised by the Credit Suisse report released in September 2010.
- Exelon CRA Report.pdf – This is a study completed by CRA regarding the impact of EPA regulations on coal generation.
- MJBAandAnalysisGroupReliabilityReportAugust2010.pdf – This is a study completed by MJ Bradley regarding the impact of EPA regulations on coal generation.
- NREL Report v2.doc- This summarizes the *Presentation Analyzing Potential Impacts of Coal Plant Retirements in the U.S.* that was completed on October 6th.
- Press Release for MJBA and Analysis Group Reliability Report August 2010.pdf – This the press release related to the MJ Bradley study of the upcoming EPA regulations.
- Summary of INGAA Report on Renewable Integration.doc- This summarizes the INGAA Report *Firming Renewable Electric Power*

Generators: Opportunities and Challenges for Natural Gas Pipelines that was released on March 21, 2011.

- Summary of NERC Climate Change Part 2.doc – This answers questions raised by NERC's report on climate change regulations.
- Summary of NERC Reliability Assessment of EPA Regulations FINAL ver1.doc- This summarizes the *2010 Special Reliability Scenario Assessment: Potential Resource Adequacy Impacts of U.S. Environmental Regulations October 2010 Report.*
- Summary of NERC Reliability Impacts of Climate Change Initiatives.doc- This summarizes the *NERC Reliability Impacts of Climate Change Initiatives* that was completed on July 28, 2011.
- Summary of Report by CRA on Coal Retirements (3).doc- This summarizes *A Reliability Assessment of EPA's Proposed Transport Rule and Forthcoming Utility MACT* by Charles River Associates that was completed on December 20, 2010.
- Summary of Report Prepared for Clean Energy Group final.doc- This summarizes *Ensuring a Clean, Modern Electric Generating Fleet While Maintaining Electric System Reliability* by M.J. Bradley & Associates.
- Summary of the December 8th Coal Retirement Presentation by the Brattle Group.doc- This summarizes the December 8th presentation by the Brattle Group regarding the potential impact of upcoming EPA regulations.
- Updated Summary of NERC Reliability Assessment of EPA Regultions.doc- This summarizes the *2010 Special Reliability Scenario Assessment: Potential Resource Adequacy Impacts of U.S. Environmental Regulations 9/2/2010 Draft.*
- EEI_PeerReview_Tierney_Cicchetti _May2011.pdf – This is an analysis of EEI's study of the impact of the EPA's regulation on coal generation.
- BPC report on EPA regs.pdf – This is an analysis by BPC of the economic impacts of the EPA's regulations on coal generation.
- Summary of the Environmental Regulation and Electric System Reliability Report by the Bipartisan Policy Center.doc - This summarizes the *Environmental Regulation and Electric System Reliability* Report by the Bipartisan Policy Center.

OMB Data

February 15, 2011

- Toxics_Rule_OMB_021611.ppt – This is a briefing provided by the EPA regarding its upcoming regulations affecting power plants.

February 24, 2011

- Resource Adequacy and Reliability for Toxics Rule 02-24-11.pdf- This file contains analysis of IPM's predictions regarding the impact of the Toxics Rule on resource adequacy and reliability.

February 28, 2011

- 2_28_2011DRAFT - Toxics Rule Direct Emp Analysis TSD_Draft.pdf- This file contains a draft of the analysis regarding the Toxic Rule's impact on jobs.
- 2_28_2011EO12866_CoolingWaterIntakes 2040-AE95 Draft Market Model Results 20110225.doc- This file contains a summary of the Market Model Analysis completed for 316(b).

March 4, 2011

- Resource Adequacy and Reliability_v4.doc- This file contains analysis of IPM's predictions regarding the impact of the Toxics Rule on resource adequacy and reliability.
- Projected Retirements.doc- This contains a list of the units excluded from the IPM modeling efforts as they are already planning to retire in addition to those units the model projects will retire in both the base and policy cases.

March 8, 2011

- Interagency Working Comments under EO 12866 on EGU MACT Underlying Science- This includes a summary of comments provided on the EPA's MACT regulations RIA Chapter 5.

March 9, 2011

- 3_9_11_ToxR_Base_Case.epa.zip- This file contains output for the base case from the IPM analysis of the Toxics Rule's impacts.
- 3_9_11_ToxR_Policy_Case.epa.zip- This file contains output for the policy case from the IPM analysis of the Toxics Rule's impacts.

March 11, 2011

- Toxics Rule Resource Adequacy and Reliability 03-09-11_final.docx - This file contains analysis of IPM's predictions regarding the impact of the Toxics Rule on resource adequacy and reliability.
- Chapter 4.pdf – This contains technical information supporting conclusions made in the EPA's regulation of power plants.

March 14, 2011

- Summary of Interagency Working Comments on draft EGU MACT under EO 12866 Interagency Review_ 03 04 _Response_031411.doc- This is a summary of comments on EGU MACT Preamble, RIA, the October 2002 EPA Study, and the TSD titled "RESOURCE ADEQUACY AND RELIABILITY IN THE IPM PROJECTIONS FOR THE TOXICS RULE."

- Summary of Interagency Working Comments on draft EGU MACT under EO 12866 Interagency Review_ 03 04 _Response_031411.doc- This is a summary of comments on comments on the MACT Floor and supporting spreadsheets, IPM documentation, feasibility study, and the planned/expected retirements.

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

Office of Commissioner Philip D. Moeller

August 1, 2011

The Honorable Lisa A. Murkowski
United States Senate
Washington, DC 20510

Dear Senator Murkowski:

Thank you for your continuing interest in our work at the Federal Energy Regulatory Commission (FERC). As described in your letter to me, I raised the issue of how actions of the Environmental Protection Agency (EPA) could impact the reliability of our nation's electric system at the Commission's September 2010 open meeting, and I have been deeply interested in how our staff has been communicating with both the public and within government on this issue of critical importance to our nation. Thus, I share your concern about ensuring that we maintain a reliable and affordable supply of electricity.

Given these concerns, I have long-stated that I can be "fuel neutral" but I cannot be "reliability neutral". That is, I can be neutral as a regulator with regard to how competitive markets ultimately decide which types of power plants are most efficient and affordable, regardless of whether those power plants are fueled by water, natural gas, fuel oil, uranium, coal, wind, the sun, or any other fuel. But I cannot be neutral about the reliability of our electricity.

The Federal Power Act provides this Commission with statutory responsibilities over certain reliability matters. For that reason, the Commission has engineering staff in its Office of Electric Reliability that is dedicated to the topic of electric reliability, and many other Offices at the Commission have engineering and technical staff with expertise on that topic. Thus, I believe that this Commission can play an important role in providing information to the EPA on the extent to which its proposed rules will have an impact on electric reliability.

Given that you've sent similar letters to my fellow Commissioners, my answers could differ from their responses. Yet I think that should be expected, as we are individuals with potentially different views on this matter.

Thank you for asking these questions. Here are my answers:

Question 1. *With respect to the impact on electric reliability of the listed EPA rules affecting generation of electric power, please list and describe the Commission's actions taken; studies conducted; assistance provided to any other agency, including EPA; collaborative efforts with any other agency; and provision of data to any other agency.*

Answer: Concerning the impact of the listed EPA rules on electric reliability, the Commission has not acted or studied or provided assistance to any agency, including EPA. Because this answer may not be expected, I wish to clarify that the Commission acts mostly through orders in individual proceedings, although it sometimes issues reports, or holds conferences for the public, or acts in other ways.

While the Commission itself may not have acted, individual Commissioners can express their opinions, as can the staff of the Commission. I have been informed that our staff has provided assistance to other federal agencies on this topic, and that the staff has been studying various impacts of EPA proposals on energy markets. Such assistance by staff is not binding upon the Commission, and can take place without the knowledge of all or some Commissioners. The relationship of the Commission to its staff is described in the Code of Federal Regulations, and includes the following:

> The Commission staff provides informal advice and assistance to the general public and to prospective applicants for licenses, certificates, and other Commission authorizations. Opinions expressed by the staff do not represent the official views of the Commission, but are designed to aid the public and facilitate the accomplishment of the Commission's functions. Inquiries may be directed to the chief of the appropriate office or division. 18 CFR Section 388.104(a).

In addition, the Commission has "delegated authority" to several individuals on its staff. That delegated authority often extends only to matters that are unopposed or of a noncontroversial nature.[1]

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[1] *See* 18 CFR Section 375.301(c); 18 CFR Section 375.303(b); 18 CFR Section 375.307(b); 18 CFR Section 375.308(x); 18 CFR Section 375.315(b). And for a general discussion of staff's relationship to Commission action, *see, Obtaining Guidance on Regulatory Requirements,* 123 FERC ¶ 61,157, at PP 30-34 (2008).

Question 2. *Regarding collaborative efforts between FERC and EPA described above, has an Inter-Agency Task Force been established? If so, please state or provide:*

a. *the date it was established;*
b. *the source of its authority;*
c. *a copy of its charter;*
d. *a description of the scope of its work;*
e. *a schedule of its meetings, including a list of its meetings to date and any planned meetings;*
f. *any minutes of its meetings; and*
g. *a list of the agencies and agency officials participating.*

Answer: I do not believe that the meetings that have been held between staff in the Office of Electric Reliability and EPA constitute an Inter-Agency Task Force as described in the subparts of your question.

Question 3. *Please describe all work being jointly performed by FERC staff, including work done in collaboration with EPA – whether in connection with an Inter-Agency task force or otherwise – regarding the potential impact of EPA regulations on the retirement of electric generating units and, to the extent such information has been developed, the specific type and characteristics of units that may face retirement as a consequence of such regulations.*

Answer: Based upon the information that I received from staff in the Commission's Office of Electric Reliability (OER), staff has shared public information with EPA, provided information to EPA on the types of studies that would be needed to address reliability concerns, and provided EPA with a set of questions about EPA's analytical results so that staff could better understand an ICF model that was used by EPA. Staff in OER told me that they made an effort not to create an impression that the Commission either endorses or disagrees with the study performed by EPA. According to OER staff, EPA's reliability analysis has been limited to generation adequacy assessments for 2015. EPA's analysis is apparently limited to the expected retirements caused by two of its rulings (does not include coal residuals, green house, clean water, and others). According to the information that I received from Commission staff, they have pointed out to EPA that a reliability analysis should explore transmission flows on the grid, reactive power deficiencies related to closures, loss of frequency response, black start capability, local area constraints, and transmission deliverability.

In addition, and also based upon the information that staff has told me, staff has indicated to EPA that the regional transmission planners would be best suited to run these studies. Commission staff has suggested that EPA interact with the ongoing initiatives at the grid operators known as "PJM" and "MISO" which are assessing the effect of projected retirements on their grids. Commission staff

informed me that they believe that EPA needs to interact with regional transmission planners to determine the issues that may affect the regional grids, especially during the transition period when plants are retired and others are shut down to retrofit their facilities.

According to Commission staff, the ICF model used by EPA is a pipes and bubbles tool which assumes transmission deliverability is not an issue within the region. The ratings of the pipes (transfer limits) are apparently determined by consultants who analyze available transmission planning studies, historical OASIS postings and linear analysis. Based on the rating of the pipes, OER staff understands that the tool determines if firm transfers can be delivered from region to region as well as capacity additions needed to meet target reserve margins. OER staff believes that the ICF model does not consider certain reliability issues. According to OER staff, the ICF model could provide a potential scenario of the generation mix available in future years. OER staff believes that a transmission requirements study would still be needed to develop a transmission expansion plan for the potential generation mix that may result from the ICF tool.

Question 4. *Please describe FERC's efforts to explain the effect of potential retirements on electric reliability. If research, data, or analysis has been developed by or supplied to FERC, please provide it. If no analysis has been conducted, please explain why.*

Answer: The Commission has not engaged in efforts to explain the effect of potential retirements on electric reliability. The Commission has not issued any reports, orders, held a conference, or taken any action on this matter. While the Commission itself has not taken action, individual Commissioners have expressed their opinions. In that regard, on May 3, 2011, I discussed this matter with Gina McCarthy, Assistant Administrator for the Office of Air and Radiation, and some of her staff. On October 28, 2009, at Chairman Wellinghoff's invitation, I participated in a meeting with EPA, White House, Department of Energy, and others at a meeting with the White House Council on Environmental Quality.

While the Commission has not acted on this matter, the staff of the Commission has expressed its opinions. In response to why the Commission has not performed an "analysis", I believe that the Commission should consider whether it should issue a report containing a formal Commission analysis. If the Commission decides against the issuance of an analysis, then at minimum, the Commission should direct its staff to use its expertise to perform an analysis of the EPA's rules that could impact reliability of electricity --- and disclose that analysis for public comment --- and then hold a technical conference for public input.

Question 5. *Please describe fully FERC's powers to protect electric reliability in the event of plant retirements, and what measures FERC plans to take to ensure electric reliability or an explanation of why such measures have not been devised. Please provide the following assessments, or an explanation of why such assessments have not yet been devised:*

a. *an assessment of generation adequacy in the face of retirements of significant generating units in transmission-constrained areas;*
b. *an assessment of the effect of retirements of generating units in organized markets for energy and capacity (e.g. on prices and unit commitment); and,*
c. *a general assessment of the capacity to permit and construct new electric generation units in a timely manner such that electric supplies form retired plants are replaced and anticipated demand growth is met.*

Answer: To the extent that measures to ensure reliability have not been devised by Commission staff, then the Commission should direct its staff to develop such plans and take such measures. Given the importance of electric reliability, such plans and measures should be developed in an open process with opportunity for input from the general public.

Question 6. *The Clean Air Transport Rule specifically lists ensuring electric reliability as a "key guiding principle." Please describe any research, documentation or analysis FERC has provided EPA for this rule.*

Answer: To my knowledge, the Commission has not provided EPA with any research, documentation, or analysis of the Clean Air Transport Rule. However, individual Commissioners or the Commission staff may have provided their own opinions to EPA. I believe that the Commission should consider whether it should direct its staff to issue a report to the Commission on the Clean Air Transport Rule.

Question 7. *Regarding the Commission's FY 2010 Performance and Accountability Report to Congress, quoted above, and the staff analysis of electric reliability impacts referenced in the quotation, please describe or provide:*

a. *the study and all supporting materials including research;*
b. *a list of any other agencies involved in the production of the study with information on their involvement*
c. *actions FERC has taken or plans to take based on the study; and*
d. *how and where the study has been made public, or why it has not been released*

Answer: I believe that the Chairman will describe staff's work on this topic when the Chairman sends his response to you.

Question 8. *In your view, would compliance with EPA or other environmental regulations excuse a violation of FERC-approved electric reliability standards? If so, should the Commission refrain from imposing penalties for these violations?*

Answer: In my view, compliance with EPA or other environmental regulations would not necessarily excuse a violation of FERC-approved reliability standards. Every individual case should be addressed on its merits. For example, instead of excusing reliability standards, perhaps in some cases compliance with FERC-approved reliability standards should excuse non-compliance with EPA regulations. As stated above, I can be "fuel neutral" but I cannot be "reliability neutral".

Question 9. *Please assess whether FERC has sufficient statutory authority to protect electric reliability in collaboration with other federal entities that are undertaking rulemakings.*

Answer: At this time, the Commission seems to have sufficient statutory authority to protect electric reliability against actions that might be taken by EPA --- given my assumption that EPA, if provided with accurate information, will take actions that appropriately balance the importance of reliable electric supply against its statutory obligations. To assist the EPA, this Commission already has authority to issue reports, hold conferences, and seek information from the public on the reliability impacts of contemplated EPA rules. In addition, this Commission can describe the reliability impacts of the actions contemplated by the EPA by making appropriate submissions in the various rulemakings that are in process at EPA.

My views are shaped by the complexity and cost associated with shutting down a power plant --- and my concern that EPA be able to accurately model that process as part of its decision making. If a power plant is retired with inadequate notice, electricity can become less affordable and less reliable. Before a power plant is retired, the operator of the transmission grid must consider how to provide reliable electricity without that plant as part of the network.

A numerical example shows how cost and reliability need to be considered when a power plant is retired. That is, the operator of the transmission network could determine that a power plant can be retired only after utilities invest $50 million into upgrading the transmission system. Since they are long-lived transmission assets, those $50 million in assets would be expected to be in-service for some fifty years, which means that they would cost customers roughly $1 million a year (ignoring interest and present value). But in the interim, the power plant owner would be entitled to recover its costs of remaining open even after it had decided to shut its plant down. That cost could be $50 million to customers for one year of service --- a cost that could have been avoided had the $50 million in transmission upgrades been in service. Thus, while the transmission upgrades

might only cost about $1 million each year for fifty years, the $50 million paid by consumers in one year to keep a plant open could make the retirement more costly than necessary. And this example doesn't even consider the cost of building a new power plant to replace the power that will be unavailable with the shut down.

In addition to this example, please see my concluding thoughts below, where I describe the recent plans to close certain generating units in the Philadelphia area that are known as Cromby and Eddystone.

Question 10. *Is FERC or any other agency, to your knowledge, soliciting or relying upon advice or assistance from any entity established pursuant to the Federal Advisory Committee Act?*

Answer: No, not to my knowledge.

Concluding Thoughts

I greatly appreciate your decision to send me these questions. Not only have you raised the visibility of this important issue, but your inquiry has prompted the Commission staff to better inform me on this topic.

- **The Critical and Complex Role of Reliability**

The recent and enduring heat wave that simultaneously impacted a large portion of the population of the United States underscores the essential and life-saving importance of electric reliability. With economic weakness and closed factories throughout the nation, you might have expected the available power plants to easily handle the heat wave. Yet the operators of the power grid relied on all of their available resources, including coal plants that are expected to be shut down because of EPA decisions, in order to ensure the reliability of the grid and the health and safety of the public.

My consistently expressed concern with EPA rulemakings has been the potential for a negative impact on reliability. I believe the system can absorb significant retirement of older coal-fired, oil-fired and natural gas-fired generation units. But it absolutely must be done in an orderly manner that does not impact our health and safety.

- **Timing of EPA Regulations and Utility Planning Horizons**

The timing of the EPA regulations does not conform to the relevant planning horizons in the electric sector of our economy, one of the most capital-intensive sectors of industry. Transmission lines and power plants are often planned over

a ten-year period, and in consideration of the long-lived nature of assets that are expected to be in service for more than forty years. Compounding this situation is the fact that the United States has several distinct wholesale markets for electricity, including different types of markets that are broadly categorized as bilateral markets (covering many western and southeastern states) and organized markets (including markets in Texas, California, and many Midwestern and eastern states).

The rules for these electricity markets are not standardized. For reliability purposes, this exacerbates the challenge of conforming to EPA rules. Each region has different standards for planning for new power plants and transmission lines, and different standards for retiring an existing power plant. Thus, EPA and Commission staff must ensure that their analysis of reliability impacts is applicable in all regions of the nation, not just one or two.

In addition, some of the organized markets hold auctions of electric capacity three years in advance of the time when such capacity is needed. These auctions are generally designed to ensure that adequate generating capacity will be built when it is needed three years in the future. Other markets are considering equivalent types of "forward" capacity markets for the same reasons. A three-year advance cycle of generation procurement does not align with the EPA rules, as bidders into these markets may not know whether they can submit bids for all of their power plants, or if some of their power plants will need to retire within the next three years because of EPA regulations.

Prior to the most recent heat waves this summer, several studies concluded that the nation has enough excess capacity to absorb the retirement of surplus power plants. We should all be able to agree that surplus power plants can be retired if the remaining power plants are located where they can replace the power that will no longer be available. But looking at this issue from the perspective of the minimum number of power plants that is absolutely necessary doesn't answer the question of where power plants must be located. An older coal plant in a specific location may not provide a lot of energy to the grid, but it may be in a location with access to transmission lines or where its voltage support is critical for reliability.

- **The Cromby-Eddystone Example**

I have often cited the retirement of two electricity generating plants in the area surrounding Philadelphia as an example of how EPA air rules could impact the reliability of specific pockets of electricity load. In December 2009, Exelon provided notice to PJM of its intent to deactivate the Cromby and Eddystone units --- four fossil-fired generating units located in Southeastern Pennsylvania, all of which had operated for more than fifty years. Cromby Unit No. 1 is a 144 MW coal-fired unit; Cromby Unit No. 2 is a 201 MW peaking unit that is fueled by

gas or oil. Eddystone No. 1 and No. 2 are both coal-fired units with a capacity of 279 MW and 309 MW, respectively.

Upon receipt of Exelon's notice, PJM conducted a deactivation study and determined that Cromby Unit No. 2 and Eddystone Unit No. 2 would be needed past their planned deactivation date to manage localized reliability issues pending completion of transmission system upgrades. Specifically, unless 18 identified transmission upgrades totaling $44 million were constructed and placed into service, the study revealed that the retirement of these generating units could have an adverse effect on reliability. Some of these upgrades were placed in-service earlier this year and the last of these upgrades are expected to be completed by June 2012.

As part of its obligation to ensure just and reasonable rates, the Commission conducted a proceeding that would determine the amount of compensation that would allow Exelon to recover its costs if it decided to keep the units operational. In that proceeding, Exelon explained that in 2009, the two generating units realized negative pre-tax cash flow of approximately $28 million when selling capacity, energy, and ancillary services at market rates. Exelon anticipated that future cash flows would be significantly negative because the units would require costly project investment to maintain their operability and because their dispatch would be limited due to environmental restrictions. Moreover, the generating units failed to clear in their regional capacity auctions, demonstrating that Exelon's costs to operate the units as capacity resources exceed the market price for capacity.

The proceeding settled prior to a formal hearing and the Commission ruled that the generating units could collectively charge customers about $82 million to continue operating before the transmission upgrades entered service.[2] The financial implications of at least this situation are clear: in order to retire these units, customers will pay at least $44 million for transmission upgrades, to be collected over the next forty to fifty years, and customers will also pay some $82 million to Exelon so that the power plants will be available for about a year, to be collected over the next year or so.

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[2] As provided in the settlement, Eddystone Unit No. 2 received a twelve-month contract term, and Cromby Unit No. 2 received a seven-month term. If the transmission upgrades do not enter service on the expected date, the settlement provides for Exelon with an opportunity for additional compensation. *See* application of Exelon Corp. in FERC Docket No. ER10-1418, and Commission orders issued on September 16, 2010 and May 27, 2011: *Exelon Generation Co., LLC,* 132 FERC ¶ 61,219 (2010) *and Exelon Generation Co., LLC,* 135 FERC ¶ 61,190 (2011).

- **Better Data on Unit Retirements Now Available**

The uncertainty over proposed EPA rules has already impacted capacity markets. As described briefly above, some capacity auctions are held three years in advance. In PJM, the most recent (2011) forward capacity auction for 2014/2015 revealed that an increasing amount of generation from coal-fired plants is at risk of retirement; as 14% less capacity from coal plants cleared the auction when compared to the 2010 auction. PJM predicts that this trend of coal-fired generation retirements will continue into 2012 for its 2015/2016 auction.

PJM's RTO-wide capacity price for 2014/2015 substantially increased by 354 percent from the prior year's auction results. Increased prices in the PJM-West region showed much less price separation than in prior years from the PJM-East region. The rise in PJM-West capacity prices reflects the fact that, due to economic weakness, there are now fewer transmission constraints and congestion on the grid, which in turn allows for more affordable power to flow from west to east.

- **Recommendations**

Not only do I suggest that you and your Committee continue to follow and examine this issue, I respectfully offer several recommendations.

In speaking with reliability experts, one consistent recommendation is that the EPA needs to be involved in regional market stakeholder meetings where system planning is undertaken. Only then can EPA fully appreciate the location-specific impacts of its actions. I have heard from our Office of Reliability that EPA has not been involved to date.

In addition, I believe the federal government needs to convene an open and transparent process to assess the reliability implications of the EPA rules individually and in aggregate. EPA seems a natural choice, given that their rules would be the topic of the process. The Commission may also be a natural choice, given our responsibility for electric reliability. Regardless of which part of government convenes this open and transparent process, I would recommend that the North American Electric Reliability Corporation (NERC) be a major participant in any such process. Given the time constraints imposed by the courts on EPA, perhaps this process should have been initiated long ago. In any event, the feasibility of any court-imposed timeline is, at a minimum, worthy of consideration by Congress.

My answers to your questions also contain several recommendations. In response to question 4, I said that the Commission should consider whether it should issue a report containing a formal Commission analysis of potential retirements on electric reliability. If the Commission decides against the issuance of an analysis, then at minimum, the Commission should direct its staff to use its

expertise to perform an analysis of the EPA's rules that could impact reliability of electricity --- and disclose that analysis for public comment --- and then hold a technical conference for public input.

And in response to question 5, I said that to the extent that measures to ensure reliability have not been devised by Commission staff, then the Commission should direct its staff to develop such plans and take such measures. Given the importance of electric reliability, such plans and measures should be developed in an open process with opportunity for input from the general public.

In response to question 6, I said that the Commission should consider whether it should direct its staff to issue a report to the Commission on the Clean Air Transport Rule.

- **Documents**

I am not providing documents responsive to this request at this time, as I will first have my personal staff review the documents that Commission staff is providing to you. If after that review I discover that I have additional documents in my possession that I believe are responsive, I will provide them to you.

- **Conclusion**

Finally, the impact of retiring power plants can be cushioned by making it easier to build the transmission lines that are needed to move power to customers. By building needed transmission, we can maintain the reliability of our nation's transmission network, while simultaneously improving consumer access to lower-cost power generation. Plus, a well-designed transmission network can allow efficient and cost-effective renewable resources to compete on an equal basis with traditional sources of power. I am always willing to express my thoughts on legislative changes that could ease the difficult process of building transmission.

I have no doubt that this nation is capable of retiring a substantial proportion of older and less efficient power plants that produce a disproportionate amount of air emissions. Nor do I doubt that power plants which emit too many pollutants should be eventually retired. But these retirements must be done in an orderly manner that does not threaten the reliability of electricity, which in turn affects our public health and safety.

Sincerely,

Philip D. Moeller

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

OFFICE OF THE COMMISSIONER

August 1, 2011

The Honorable Lisa A. Murkowski
United States Senator
Committee on Energy and
Natural Resources
Washington, D.C. 20510-6150

Dear Senator Murkowski:

Thank you for your letter of May 17, 2011, and for the opportunity to share with you my thoughts on these important issues.

With regard to questions 1-7, I have no further information to add to the responses provided by Chairman Wellinghoff and Commissioners Norris and LaFleur, and by Commissioner Moeller, in their letters dated August 1, 2011. However, with respect to questions 8, 9 and 10, I wish to separately set forth my own views regarding the relationship between the Federal Government and users, owners, and operators of the bulk electric system.

Regulated public utilities are obligated to serve electricity ratepayers. Congress assigned to FERC authority with respect to the reliability of the bulk electric system in 2005. The United States has superb records in both environmental protection and electric reliability. I remain committed to ensuring the reliable operation of our Nation's electric grid. Reliable service of electricity is essential to the health, welfare, and safety of the American people and necessary to serve our economy. However, I recognize that environmental protection laws and regulations are important to the well-being of our Nation as well.

Question 8 highlights the problem of an entity ensnared in the dilemma of conflicting laws or regulations. I have not researched whether compliance with an EPA regulation could excuse a violation of a FERC-approved reliability standard and I have not reviewed, nor do I comment on, the authority of the United States Department of Energy to address these issues. However, the users, owners and operators of the bulk-electric system should not be compelled by their government to choose between compliance with environmental laws or with FERC-approved reliability standards. Put differently, regulated entities should not have to elect which agency's penalty they would rather face. Requiring public utilities to make such a Hobson's choice does not serve consumers and, frankly, is not good government.

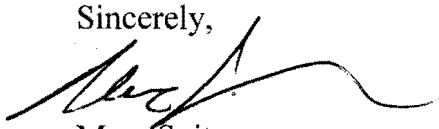
But I also believe that both the regulated and the regulators can and must do more to ensure that regulated entities do not find themselves in the position of having to make a Hobson's choice. First, FERC and the EPA need to be proactive to ensure that reliability concerns are considered and addressed in any analysis by the EPA of its environmental regulations affecting utilities. To this end, I recommend that FERC and the EPA continue their dialogue but in a more formalized and expansive fashion. Given the integrated nature of today's society, such coordination would ensure that the EPA will not enforce its rules in a vacuum.

Second, the electric industry recognizes its obligation to comply with both environmental regulations and FERC-approved reliability standards and to plan their systems to reliably serve consumers while complying with environmental requirements. In the first instance, the regulated entity, with better knowledge of its operations and requirements, should seek to harmonize how it will meet the various regulatory requirements it faces. It must have adequate time to do that.

Finally, I suspect it will be the rare situation when a regulated entity finds itself, notwithstanding adequate planning, in a position of having to choose between compliance with one regulator's rules over another's. In that instance, however, it should be the duty of the regulators to work together, and with the regulated entity, to find a resolution that best assures reliable operation of the electric grid and compliance with environmental standards.

I thank you very much for inquiring as to the relationship between affordable and reliable electricity service and environmental regulation. I hope the foregoing discussion has been responsive to your letter, and I invite any further questions or comments on this critical topic.

Sincerely,



Marc Spitzer
Commissioner
Federal Energy Regulatory Commission

August 23, 2010

VIA ELECTRONIC MAIL TO: a-and-r-docket@epa.gov

U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Attention: Docket ID Nos. EPA-HQ-OAR-2002-0058 and EPA-HQ-OAR-2006-0790

Re: *National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial and Institutional Boilers and Process Heaters*, 75 Fed. Reg. 32006 (Jun. 4, 2010); *National Emission Standards for Hazardous Air Pollutants for Area Sources: Industrial, Commercial, and Institutional Boilers, Proposed Rule*, 75 Fed. Reg. 31895, 31900 (June 4, 2010).

Dear Ladies and Gentlemen:

The National Mining Association ("NMA") submits these comments in the two above-referenced dockets, hereafter, respectively, the proposed "Boiler MACT" rule and the proposed "Area Source" rule. NMA is a national trade association of mining and mineral processing companies whose membership includes the producers of most of the nation's coal, metals, industrial and agricultural minerals; the manufacturers of mining and mineral processing machinery, equipment and supplies; and the engineering and consulting firms, financial institutions and other firms serving the mining industry.

I. Introduction

NMA member companies, along with the manufacturing and other industrial customers they supply, provide fuel to and operate industrial boilers and process heaters to generate steam and electricity. Extractive industries, energy intensive industries and the manufacturing sector continue to face severe economic conditions that impact millions of high-wage jobs. NMA supports policy decisions that will lead to economic growth and recovery, create jobs, encourage technological advancement and result in air quality improvement. The proposed Boiler MACT standards, however, are far more stringent than needed to protect human health and the environment from hazardous air pollutant (HAPs) emissions from industrial boilers. EPA is afforded the discretion, and maintains the technical

justification, to ease the burden of these proposed regulations on the economy while adequately protecting health and the environment.

NMA offers the following comments on the proposed Boiler MACT and Area Source rules. In addition, as discussed in more detail below, NMA believes that the regulatory analysis supporting the proposed rules is fatally flawed because it fails to take into account the cumulative impact of all of EPA's now-numerous completed, pending and expected rulemakings that are intended to and will have the effect of substantially reducing the usage of coal in the United States. These rulemakings include those affecting the use of coal for electric generation, where EPA is implementing a coordinated program to create, in its words, a "clean, efficient, and completely modern power sector," those affecting the use of coal for industrial, commercial and institutional purposes, such as the two rules specifically at issue here, and those directly affecting coal mining.

All of these rulemakings together will produce a dramatic and cascading series of effects not only in the coal industry but throughout the economy. There will be direct effects on coal employment and indirect effects on employment generally in the economy as a result of higher energy prices. Higher energy prices will also affect GDP and economic activity generally. American competitiveness will also be affected, as higher prices undermine the ability of American business to compete, with resulting off-shoring of American business and jobs.

Impact analysis performed by EPA now proceeds on a rulemaking-by-rulemaking basis, as if one rulemaking is unconnected to the next and as if the regulatory consequences are not cumulative. As a result, EPA's impact analyses mask the cumulative effect of the Agency's overall regulatory program. Individual-regulation impact analyses often predict limited effects, when in truth the compounding effects of the overall program may produce extremely large consequences.

This Balkanized approach to impact analysis impairs the public's right to notice and comment regarding EPA regulation. For instance, EPA's Regulatory Impact Analysis for the Boiler MACT rule shows relatively minor effects, which might lead the public to believe that the rule is relatively innocuous. Cumulative analysis, on the other hand, is likely to lead to a far different conclusion—that coal usage will decline dramatically as a result of the combined effect of numerous EPA rulemakings with attendant serious economic consequences. Armed with that information, the public would likely provide significantly different comment on the rule. EPA and other cooperating agencies rely upon similar cumulative impact assessments when analyzing proposed federal actions subject to the National Environmental Procedure Act, and the public should be afforded the same opportunity here.

Analyzing cumulative impacts is not just good policy, it is required by Executive Order 12866 and the notice and comment rulemaking provisions of the Clean Air Act ("CAA"). NMA therefore urges EPA to defer final action on the two rules at issue here until the necessary cumulative impact assessment is produced. The specific

type of analysis that NMA recommends is set forth as an attachment to these comments.

II. EPA Must Produce a Cumulative Impact Analysis of Its Regulatory Program Affecting the Use of Coal

A. Cumulative Analysis Is Needed

1. EPA's coordinated regulatory agenda to reduce coal usage

EPA has undertaken a far-reaching regulatory program that is apparently designed to reduce the use of coal throughout the American economy. The coordinated nature of this program is most evident in the electric power sector, which EPA has undertaken to transform. Upon taking office, the EPA Administrator formulated seven priorities, one of which was to "develop a comprehensive strategy for a cleaner and more efficient power sector, with strong but achievable reduction goals for SO_2, NO_2, mercury and other air toxics."[1] This goal was reiterated by EPA in its recently proposed Transport Rule, where the Agency said that "[i]n furtherance of this priority goal, and to respond to statutory and judicial mandates, EPA is undertaking a series of regulatory actions over the course of the next 2 years that will affect the power sector in particular."[2]

These EPA rulemakings include:

- The recently completed National Ambient Air Quality Standards ("NAAQS") for sulfur dioxide ("SO_2") and nitrogen dioxide ("NO_2");

- The currently proposed new ozone NAAQS and the soon-to-be-proposed new $PM_{2.5}$ NAAQS;

- The proposed Transport Rule and expected additional transport rules for the 1997 ozone NAAQS;

- The soon-to-be-proposed MACT standards for electric generating units ("EGUs");

- EPA's greenhouse gas ("GHG") regulation under the Prevention of Significant Deterioration ("PSD") program;

- The soon-to-be-proposed New Source Performance Standards for EGUs (including GHG NSPS);

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[1] *Federal Implementation Plans to Reduce Interstate Transport of Fine Particulate Matter and Ozone*, 75 Fed. Reg. 45,210, 45,227/3 (August 2, 2010), quoting the EPA Administrator's January 12, 2010 outline of the Agency's seven priorities.

[2] *Id.*

- Best Available Retrofit Technology ("BART") standards for EGUs;
- The proposed regulations for coal combustion residues; and
- The soon-to-be-proposed water quality regulations for cooling intake structures and soon-to-be-proposed effluent guidelines for discharges from power plants.

Recognizing that all of these regulations are implementing a single overall priority goal and constitute a "comprehensive set of requirements,"[3] EPA pledged to coordinate at least its power sector air quality regulations and, to the extent it could under relevant statutory law, to coordinate these power sector air quality regulations with the coal combustion residue regulations and the two power sector water quality regulations.[4] EPA further pledged to "engage with other federal, state and local authorities, as well as with stakeholders and the public at large, with the goal of fostering investments in compliance that represent the most efficient and forward-looking expenditure of investor, shareholder, and public funds, resulting, in turn, in the creation of a clean, efficient, and completely modern power sector."[5]

EPA's regulatory agenda for the power sector will almost certainly significantly reduce the use of coal for electric generation. While EPA so far has not done any study of the cumulative impact of these regulations on coal use (or otherwise), the contractor EPA uses to model impacts of individual regulations recently produced its own analysis showing that just the EGU MACT standards alone will force major retirements of coal-fueled power plants.[6] Forced retirements will have substantial negative economic impacts nationally, but will also have severe impacts locally, as exemplified by the Arizona Hopi and the Navajo Generation Station:

> "Scott Canty, the Hopi Nation's general counsel, explained to a panel of lawmakers on Nov. 2 that closure of the Navajo Generating Station would cripple the tribal government. The Hopi Nation relies heavily on coal revenues to fund its government, Canty said. About 88 percent of the tribal government's budget comes from revenue generated by coal-fired energy production at the Navajo Generating Station, Canty said. . . . The EPA has proposed rules that would require the power plant to install expensive emissions equipment to address visibility impairment issues at the Grand Canyon. But the plant's

[3] *Id.*

[4] *Id.*

[5] *Id.*

[6] *Id.*

> owners and the tribes argue that the retrofit is too costly."[7]

Moreover, news accounts recently reported that EPA is well aware that its regulatory efforts in the power sector will increase the costs to coal-fueled EGUs and make them less competitive with renewable resources. In an article entitled "Administration Eyes EPA Rules To Spur Shift From Coal To Renewables," it was reported that:

> Rob Brenner of EPA's Office of Air & Radiation told a July 28 meeting of the agency's environmental justice advisers that pending rules to control emissions, waste and water discharges from utilities will not only protect public health but add costs to the industry that might make renewable energy a more viable alternative.
>
> "We need to set health-based standards for power plants, and once we do that then they can compete with some of these renewable sources," Brenner said at the National Environmental Justice Advisory Committee (NEJAC) meeting in Washington, DC. He added later, "It's not really a fair competition because [coal-fueled power plants] are cheaper than they should be because they're not controlling their pollutants" to their full extent because EPA is yet to issue key rules for the sector, including a mercury air rule and a plan to regulate coal combustion residue.[8]

The same article reported that the White House also understands that transforming the power sector will inevitably result in reduced use of coal and increased use of renewables. Referring to remarks of Nancy Sutley, Chair of the White House Council on Environmental Quality, the article reported that:

> Sutley responded that she doubts the existence of so-called clean coal. "Other people have labeled it 'clean coal,'" she said. "I don't know if I would necessarily concede that that is real. . . . I think in the long run, not just for the [United States] but for the world, that

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[7] Luige del Puerto, *Hopi Nation in Arizona appeals for help as coal plant face disclosure,* ARIZ. CAP. TIMES, Nov. 3, 2009, *available at* http://www.allbusiness.com/government/government-bodies-offices-regional/13389633-1.html.

[8] *Administration Eyes EPA Rules to Spur Shift from Coal to Renewables*, InsideEPA.com (July 29, 2010), *at* http://insideepa.com/201007291915893/EPA-Daily-News/Daily-News/administration-eyes-epa-rules-to-spur-shift-from-coal-to-renewables/menu-id-95.html.

> developing and making sure that there is access to these inherently cleaner sources of energy is important. . . . . We need to use energy more efficiently and more cleanly."[9]

Other EPA regulatory proposals are also part of an overall strategy to reduce the use of coal throughout the economy. This strategy includes the Boiler MACT and Area Source rule at issue here. In the regulatory preamble to the Boiler MACT rule proposal, EPA stated forthrightly that its reason for proposing strict MACT standards for coal boilers and process heaters but only work practice standards for natural gas boilers was to incentivize operators of coal-fueled boilers to switch to natural gas and to discourage operators of natural gas-fueled boilers from switching to coal.[10] In discussing this issue, EPA made plain that it considers coal to be a "dirty" fuel whose use is inconsistent with the CAA and therefore should be discouraged.[11] In contrast, EPA considers natural gas to be a "clean fuel" whose use should be encouraged at coal's expense. According to EPA:

> In addition, emission limits on gas-fueled boilers and process heaters may have the negative effect of providing an incentive for a facility to switch from gas (considered a "clean" fuel) to a "dirtier" but cheaper fuel (i.e., coal).[12]

The coal industry also faces a panoply of prospective regulation of the process of producing coal. These regulations include potentially stricter NAAQS for PM_{10} which may make western surface mining untenable, new restrictions in Appalachia that could result in major reductions in coal mining in that region, and potential imposition of NSPS standards on mining emissions of PM_{10}, methane, volatile organic compounds, and nitrogen oxides. All of these regulations together—EPA's power sector regulations, its regulations for the use of coal in the manufacturing and commercial sectors, and its regulations of coal mining—all have the potential to combine to cumulatively and dramatically reduce coal usage.

2. The effect of each EPA individual rule affecting coal, including the rules at issue here, cannot be understood without a cumulative analysis

Given EPA's intent to transform the power sector from what it is today into something different and given its efforts to reduce coal use throughout the economy, EPA must produce a cumulative and economy-wide assessment of this

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[9] *Id.*

[10] *National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters*, 75 Fed. Reg. 32,006, 32,025/3 (June 4, 2010).

[11] *Id*.

[12] *Id.*

program. As EPA has proposed and finalized each individual regulation, EPA's impact analysis has been limited to the effect of the specific regulation in question. However, to understand the effect that all the rules together will create, it is necessary to study the effect of that program in total.

These effects could be extremely large. For instance, EPA projects the annual cost of the SO_2 NAAQS to be $2.9 billion to $3.0 billion in 2020, with most of those costs associated with the power sector[13]; the annual cost of the Transport Rule (all in the EGU sector) to be $3.7 billion in 2012 and $2.8 billion in 2014,[14] with another $2 billion in 2020 and 2025[15]; the annual cost of the ozone standard to be $32 – 44 billion, again with much of that cost in the EGU sector[16]; and the total costs of the coal combustion residue rule to be over $8 billion under the Subtitle D option and over $20 billion with the Subtitle C option.[17] Despite the request from NMA and others for EPA to assess the cost of its GHG regulatory program, EPA has refused to do so, and so that cost is unknown but could be very substantial as well. The other programs identified above will also add significant cost, with the new EGU MACT standards expected to have a very large impact.

But these estimates, as large as they are, mask the overall effect of the regulations when considered cumulatively. The proposed Transport Rule is an example. EPA's draft Regulatory Impact Analysis ("RIA") for this proposed rule envisions relatively small impacts to coal usage. EPA projects that EGUs can meet the requirements of the rule by switching from high sulfur to low sulfur coal and by installing pollution control equipment, with the result that EPA estimates the retirement of only 1.2 GW of "small and infrequently used" coal-fueled generating units by 2014.[18] Based on the foregoing, EPA projects additional cost to the utility industry of $3.7 billion in 2012 and $2.8 billion in 2014 ($2006).[19]

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[13] U.S. Environmental Protection Agency, *Final Regulatory Impact Analysis (RIA) for the SO2 National Ambient Air Quality Standards (NAAQS)* at 7-4, Table 7.1, June 2010 (Docket ID EPA-HQ-OAR-2009-0769-0059).

[14] 75 Fed. Reg. at 45348/1.

[15] *Id*. at 45333, TableV.E-1.

[16] U.S. Environmental Protection Agency, *Final Ozone National Ambient Air Quality Standards (NAAQS) Regulatory Impact Analysis* at 5-23, March 2008 (Docket ID EPA-HQ-OAR-2005-0161-2849) (estimate for 0.065 ppm standard; EPA's proposal is 0.060-0.070).

[17] *Hazardous and Solid Waste Management System; Identification and Listing of Special Wastes; Disposal of Coal Combustion Residuals From Electric Utilities*, 75 Fed. Reg. 35218, 35134, Table 1 (June 21, 2010).

[18] U.S. Environmental Protection Agency, *Regulatory Impact Analysis for the Proposed Federal Transport Rule* at 14, June 2010 (Docket ID EPA-HQ-OAR-2009-0491-0078).

[19] *Id*. at 31.

NMA will comment on these projections in its comments on the proposed Transport Rule, but for purposes here EPA's projection of almost no impact to the coal industry is not meaningful because it is based on an analysis of the Transport Rule in isolation. Thus, even if EPA's projected assessment of the effect of the Transport Rule on coal is correct, that assessment assumes that there are no other forthcoming EPA regulations that will affect the use of coal, an assumption that is clearly wrong. The control options that the Transport Rule RIA envisions appear to exhaust (and likely go beyond exhausting) the ability of the power sector to absorb EPA regulation without large-scale closings of coal plants. The next regulation following the Transport Rule that adds cost to coal-fueled electric generation therefore will force plant closings, but it is incorrect to say that it was that next regulation and not the Transport Rule that causes the plant closings. Both rules and indeed the entire program cause that effect.

EPA's push for replacement of coal with natural gas in the national electricity generation mix, as discussed above, will have severe economic impacts. The American Public Power Association recently published a study evaluating the economic impact of relying more heavily on natural gas to generate electricity.[20] It provides insights into the potential cumulative economic impacts of the numerous recent rulemakings, proposed rules and forthcoming proposals that focus on coal-based electricity generation. According to the study, the total cost of replacing all existing coal generation with gas would be $743 billion. The study estimates that the cost of just replacing the existing 335,000 MW of coal-based generation would cost $335 billion. The need for new pipeline and storage capacity would be another major hurdle to this fuel switching and the study estimates this would cost $348 billion. The remainder of the total costs would entail necessary changes in the way natural gas is managed in the U.S. energy system, investment in training new staff to deal with the fuel changes, among other changes in power support structure.

EPA itself recognizes the need for cumulative analysis in an analogous situation. EPA requires that EPA reviewers of Environmental Impact Statements ("EISs") under the National Environmental Protection Act ("NEPA") take cumulative impacts into account, including consideration of "impacts that are due to past, present, and reasonably foreseeable actions."[21] According to EPA, in assessing environmental impacts, it is necessary to assess "[t]he combined, incremental effects of human activity" rather than just the impacts of the particular action for which federal approval is sought.[22] This is based on the recognition that individual actions "may be insignificant by themselves," but that cumulative impacts accumulate over time,

[20] Nicholas Braden, *New Study Examines Economic Impacts on Utilities if Carbon Emission Rules Cause Shift from Coal to Natural Gas* (Amer. Pub. Power Assn., Wash., D.C.), July 7, 2010 (news release).

[21] U.S. Environmental Protection Agency, *Consideration of Cumulative Impacts in EPA Review of NEPA Documents* (May 1999) at 10.
[22] *Id*. at 1.

from one or more sources and these cumulative effects must be taken into consideration.[23]

The Council on Environmental Quality ("CEQ") also requires cumulative impact analysis in EISs. CEQ regulations require that agencies considering major actions that could affect environmental quality consider the "overall, cumulative impact of the action proposed (and of further actions contemplated)."[24]

EPA's and CEQ's reasons for requiring cumulative impact analysis in EISs apply with equal force to economic analysis that EPA performs of its regulations. Where effects of a proposed action accumulate with those of other related actions, examining the effects of the proposed action in isolation will mask the overall effect of the action. That is as true for EPA's regulatory efforts to reduce coal usage as it is for environmental analysis in the NEPA context. To again cite the proposed Transport Rule as an example, as stated, EPA concludes that the rule will not materially affect the use of coal for electric generation.[25] But under the rationale of CEQ's NEPA regulations, cumulative impact analysis should be conducted because "[c]umulative impacts can result from individually minor but collectively significant actions taking place over a period of time."[26]

The same is true for EPA's analysis of the proposed Boiler MACT rule specifically at issue here. EPA's RIA concludes that the rule will have only relatively minor effects on production costs for the sectors of the economy affected. But EPA's analysis is rudimentary and only takes into consideration increased engineering costs and does not examine (at least so far as NMA can tell) fuel-switching. Yet, as stated above, the rule is designed to encourage coal boilers to fuel-switch to gas and to discourage gas-fueled boilers from fuel-switching to coal. Moreover, the proposed rule is just one of a series of rules apparently designed to reduce coal use in the United States. Even if the boiler MACT in and of itself did not significantly affect coal usage (a conclusion that cannot be drawn from the face of the RIA), that result may be masking a much larger effect on coal usage when seen in context of EPA's

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[23] *Id*.

[24] 35 Fed. Reg. 7390, 7391 (1970). It should be emphasized that CEQ does not distinguish between cumulative analysis of environmental impacts and of socioeconomic impacts. Under CEQ regulations, agencies must examine the effect of the proposed action on the "human environment." 40 C.F.R. § 1508.14 states that "[h]uman environment" shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment." While "economic or social effects are not intended by themselves to require preparation of an environmental impact statement," "[w]hen an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment." This applies to cumulative analysis: where socioeconomic effects accumulate from multiple actions, they must be assessed cumulatively, just as environmental effects must be assessed cumulatively. Thus, cumulative analysis is as relevant for examining socioeconomics as it is for analyzing environmental impacts.

[25] 75 Fed. Reg. at 45357/1.

[26] 40 C.F.R. § 1508.7.

overall program. Discerning whether that overall effect exists is the central purpose of cumulative impact analysis and the reason why such analysis is required in EISs.

B. EPA's Failure to Conduct a Cumulative Analysis Ignores Executive Order 12866 and Violates the CAA

Cumulative analysis does not just make good regulatory sense; it is legally required. Two separate authorities require cumulative analysis here.

1. Executive Order 12866

Executive Order 12866 specifically requires cumulative analysis as follows:

> Each agency shall tailor its regulations to impose the least burden on society, including individuals, businesses of differing sizes, and other entities (including small communities and governmental entities), consistent with obtaining regulatory objectives, taking into account, among other things, and to the extent practicable*, the costs of cumulative regulations.*[27]

This requirement for cumulative analysis stems from the regulatory philosophy of Executive Order 12866 that the need for and effects of government regulatory actions should not be examined in isolation but instead on an overall and coordinated basis. The preamble to the Order found that the then current regulatory system did not work in a way that produced efficient results or regulations that were "effective, consistent, sensible, and understandable."[28] The first objective of the Order, therefore, was to "enhance planning and coordination with respect to both new and existing regulations."[29] In that vein, the main administrative provisions of the Order—an interagency Planning Mechanism, the requirement that each agency produce a Unified Regulatory Agenda and develop a Regulatory Plan, the requirement for a Regulatory Working Group and the provision for quarterly Conferences among OIRA and state, local and tribal governments—were all included to enhance coordination of any specific regulation proposed by an agency with that agency's other existing and contemplated regulations, with other regulations of other agencies, and with the President's overall regulatory priorities.[30]

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[27] Exec. Order No. 12,866, 58 Fed. Reg. 51735 (Sep. 30, 1993) (emphasis added).

[28] *Id*.

[29] *Id*.

[30] *Id*.

The Statement of Regulatory Philosophy and Principles in Executive Order 12866 also stressed the need for coordination. This Statement provides that "[i]n deciding whether and how to regulate, agencies should assess *all* costs and benefits of available regulatory alternatives."[31] Agencies are instructed to "examine whether existing regulations (or other law) have created, or contributed to, the problem that a new regulation is intended to correct and whether those regulations (or other law) should be modified to achieve the intended goal of regulation more effectively"[32]; to "base its decisions on its best reasonably obtainable scientific, technical, economic, and other information concerning the need for, and consequences of, the intended regulation"[33]; and to "avoid regulations that are inconsistent, incompatible, or duplicative with its other regulations or those of other Federal agencies."[34] Indeed, the preamble to the Executive Order states that "[t]he objectives of this Executive order are to enhance planning and coordination with respect to both new and existing regulation…."[35]

This requirement for coordinated government action based on coordinated and cumulative analysis built on the same requirement in Executive Order 12291, the predecessor order to Executive Order 12866 and the Order which first required agencies to prepare Regulatory Impact Analyses. Executive Order 12291 required agencies, in promulgating new regulations, to "tak[e] into account the condition of the particular industries affected by regulations . . . *and other regulatory actions contemplated for the future*."[36]

The Executive Order 12866 requirements for coordinated and cumulative analysis apply with particular force to EPA's efforts to remake the power sector and its apparent effort to reduce coal usage throughout the economy. As shown above, each individual regulation that EPA promulgates in this area, including the Boiler MACT rule and Area Source rule at issue here, is part of a single overall program with cumulative consequences.

Moreover, EPA cannot say that cumulative analysis is not "practicable" within the meaning of section 1(b)(11) of Executive Order 12866. EPA obviously has very sophisticated modeling techniques at its disposal. If in any one rulemaking EPA believes that it cannot anticipate and therefore assess the effects of future rulemakings, EPA can assess a range of possible future regulation. Certainly, the fact that EPA has indicated that it has an overall program in furtherance of one of the Agency's seven priorities suggests that EPA has a fairly concrete idea of the

[31] *Id*. (emphasis added)
[32] *Id*. at 51735-36.

[33] *Id*. at 51736.

[34] *Id*.

[35] *Id*. at 51735.

[36] Exec. Order No. 12,291 at § 2(e) (emphasis added).

range of regulatory outcomes that it anticipates. Alternatively, EPA can delay any particular rulemaking until it has better information about future regulatory requirements that it intends to impose. What EPA cannot do, however, is to follow its current regulatory course, where the Agency analyzes individual rulemaking effects in isolation, as if there is no overall regulatory context.

2. CAA

Cumulative impact analysis is also legally required under the rulemaking provisions of the CAA where, as here, EPA has undertaken coordinated and comprehensive regulation of the power and coal sectors through a series of related rulemakings. The purpose of these CAA rulemaking provisions is both to ensure good regulatory outcomes and to protect the public's right to have adequate notice of the need for and effect of EPA regulatory action so that the public can provide meaningful comment.

In this context, section 307(d)(3) of the CAA requires that a rule be accompanied by a statement of its basis and purpose, including "the major legal interpretations and *policy considerations* underlying the proposed rule."[37] For the reasons discussed above, an underlying policy consideration of the Boiler MACT rule and Area Source rule at issue here is EPA's overall intent to incentivize reductions in coal usage and increases in resources that EPA considers to be "clean." That being the case, EPA must provide an analysis of the consequences of this policy so that the public can comment adequately. As stated, the coal industry and public at large might have an entirely different view of these proposed rules if EPA produced a cumulative assessment rather than the narrow assessment reflected in the RIA.

The U.S. Court of Appeals for the D.C. Circuit has stated that "[i]t is not consonant with the purpose of a rulemaking proceeding to promulgate rules on the basis of inadequate data, or on data that, [in] critical degree, is known only to the agency."[38] Unless the public knows the overall consequences of EPA's regulations in context of other related regulations, the public's right to provide adequate comment is compromised.

Additional support for cumulative analysis is found in section 318 of the CAA, which requires that the Administrator undertake an analysis of the cost of complying with various EPA actions, including rulemakings under section 111(d). Under section 318(d), such analyses "shall be as extensive as practicable" consistent with the standards set forth in that provision.[39]

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[37] 42 U.S.C. § 7607(d)(3) (emphasis added).

[38] *Portland Cement Ass'n v. Ruckelshaus*, 486 F.2d 373, 393 (D.C. Cir. 1973), *cert. denied* 417 U.S. 921 (1974).

[39] 42 U.S.C. § 7617(d).

C. The Specific Cumulative Impact Assessment Requested

NMA believes that the cumulative impact assessment should examine the following factors:

- Overall impacts on the economy. Specifically, the effect on GDP and jobs. In this regard, some of EPA's regulations (in particular, the NAAQS) will not just affect energy but will affect other sectors of the economy as well both directly (for example, through direct regulation of manufacturing sources) and indirectly (for example, through increased energy costs). EPA should examine all reasonably foreseeable effects of its regulations on the overall economy.

- Energy. This part of the analysis should include impacts on energy production and usage, energy shortages, energy costs, including fuel costs and retail electricity prices, and energy employment should be determined. Changes in the energy mix in the United States should be shown over time, including electric capacity additions and reductions by fuel type. Employment and energy cost impacts should be estimated for each energy sector.

- Competitiveness. This part of the analysis should include impacts on industrial and manufacturing production and competitiveness. EPA should determine the impacts of regulation on cost of production and employment in the relevant sectors, and the extent to which production and jobs will be reduced as a result of higher costs and foreign competition.

- Study design. Scenarios should be constructed for a business-as-usual case (without adoption of the contemplated regulations) and a case where EPA adopts the contemplated regulations. Additional scenarios may be included to test the findings under different appropriate assumptions. Where EPA regulation does not directly regulate but instead requires states to adopt regulations meeting EPA standards (for instance, EPA regulation under the NAAQS program and NSR/PSD program), EPA should estimate state regulatory responses, using a range if necessary. All assumptions, analytical methods and underlying data (or appropriate citations to data sources) should be provided. All impacts should be broken down on a state-by-state basis. Regulations included in the study should not be limited to just those listed in NMA's comments but should include any other EPA regulations that EPA believes will affect the nation's economy, production and usage of energy and manufacturing.

III. The Proposed Standards are Far More Stringent Then Necessary to Protect Health and the Environment

A. EPA Should Identify More Subcategories of Coal-fueled and Specialized Industrial Boilers

Section 112(d)(1) of the Clean Air Act (CAA) states that, in promulgating regulations establishing emission standards for major sources, the "Administrator

may distinguish among classes, types, and sizes of sources within a category or subcategory in establishing such standards." Section 112(c)(1) also states that, while "categories and subcategories listed under this subsection shall be consistent with the list of source categories established pursuant to Section 111 of this title," nothing in that statement "limits the Administrator's authority to establish subcategories under this section, as appropriate."

In coal-fueled industrial boiler units, testing has clearly indicated that coal rank has a significant effect on the emission levels of HCl and mercury. Low-rank coals such as lignite and sub-bituminous coals have higher moisture levels and lower carbon and energy levels, whereas high-rank coals such as bituminous and anthracite colas have lower moisture levels and higher carbon and energy levels. These qualities of the various types of coal have a direct effect on the resulting HCl and mercury emissions of the boilers that use them as feedstock. Therefore, pursuant to Section 112(d)(1), multiple subcategories should be created in the coal-fueled industrial boiler category based upon the particular type of coal combusted by the unit.

Furthermore, industrial boilers that have specialized uses and are therefore operated less frequently should be listed in a separate subcategory. Such auxiliary boilers are often operated primarily during plant startups, and as such emit very low levels of HAPs. These boilers should be categorized as those with a 10 percent capacity factor for the maximum hourly heat input, and should be subject to a work practice standard under Section 112(h) of the CAA.

B. The "Pollutant By Pollutant" Approach to Determining MACT is Not Appropriate Because it Results in Standards That Do Not Reflect the Performance of the Best Performing Boilers

The proposed Industrial Boiler MACT standards are based on pollutant-by-pollutant analyses that rely on a different set of best performing sources for each separate HAP standard.[40] In other words, EPA has "cherry picked" the best data in setting each standard, without regard for the sources from which the data come. The result is a set of standards that reflect the performance of a hypothetical set of best performing sources that simultaneously achieve the greatest emission reductions for each and every HAP rather than the actual performance of one or more real sources. This "Frankenstein" approach[41] is contrary to the language of § 112 and produces unrealistic and impracticable standards.

The statute unambiguously directs EPA to set standards based on the overall performance of *sources*. Sections 112(d)(1), (2), and (3) specify that emissions

[40] *See, e.g.*, 75 FR 32019 ("For each pollutant, we calculated the MACT floor for a subcategory of sources by ranking all the available emissions data from units within the subcategory from lowest emissions to highest emissions, and then taking the numerical average of the test results from the best performing (lowest emitting) 12 percent of sources.")
[41] *Industry Faults Strict EPA MACT Method for Regulating "Best" Sources*, Inside EPA's Clean Air Report, Sept. 3, 2009.

standards must be established based on the performance of "sources" in the category or subcategory and that EPA's discretion in setting standards for such units is limited to distinguishing among classes, types, and sizes of sources. These provisions make clear that standards must be based on actual sources, and cannot be the product of pollutant-by-pollutant parsing which results in a set of composite standards that do not necessarily reflect the overall performance of any actual source. Congress provided express limits on EPA's authority to parse units and sources for purposes of setting standards under § 112 and that express authority *does not* allow EPA to "distinguish" units and sources by individual pollutant as is proposed in this rule. *Sierra Club v. EPA*, 551 F.3d 1019, 1028 (D.C. Cir. 2008).

Even assuming for the sake of argument that the Agency does have discretion to depart from a source-wide approach to standard setting, EPA has improperly exercised its discretion in this rule. EPA has failed to provide an assessment of how many existing boilers and process heaters will be able to meet the proposed standards without taking any further control measures – *i.e.*, EPA has not shown or attempted to show that the proposed standards reflect the performance of any actual affected sources. This failure to investigate a fundamental aspect of the proposed rule renders the rule arbitrary and capricious.

EPA's database shows that very few units are best performers for more than one pollutant. As a result, the record demonstrates that the proposed standards reflect the performance of exceedingly few actual sources. Thus, even if EPA had investigated the consequences of using a pollutant by pollutant approach, it could not have reasonably concluded that the proposed standards reflect the performance of actual sources. Of the approximately 2,000 sources within EPA's inventory of solid, liquid, and gas 2 boilers, based on the emissions data in EPA's database, we estimate that only 6 sources can currently comply with the proposed standards. We believe such a result is well beyond what is required or intended for the MACT program.

C. The Proposed Rule Fails to Adequately Account for Variability in Emissions That Reasonably is Expected From the Top Performing Sources

EPA has improperly developed a CO standard that boilers must meet at all times based on 3-run stack tests that fail to properly characterize the highly variable nature of CO emissions in solid-fueled boilers. CO emissions from boilers can be highly variable, especially when fuel mix and load change. Facilities are typically required to conduct stack tests at least 90 percent of full load during normal operating conditions. Therefore, a CO stack test is going to represent the best operation of any boiler. EPA has used only 3-run stack test data, which represents only a small and unrepresentative snapshot in time captured during the best operating conditions, to set emission limits for a pollutant that is highly variable.

In fact, as demonstrated in the comments below, further analysis of CO CEMS data included in EPA's database for top performing units in each of the solid fuel

subcategories reveals that even the top performing sources would not be able to meet the proposed CO standards that are based on the performance of those very units. Further analysis of record data also clearly shows that EPA is mistaken in its suggestion that CO emissions do not vary with load. In fact, to adequately accommodate expected CO emissions variability with load, the 2004 Industrial Boiler MACT rule did not require CO CEMS data obtained at less than 50 percent of maximum load to be included in the 30-day CO average. EPA's proposal not to accommodate load variability is not supported by the record and inexplicable as a technical matter.

EPA makes a similar mistake with regard to its proposal not to set a separate standard for periods of startup, shutdown, and malfunction. On the one hand, EPA asserts that "[t]he standards we are proposing are daily or monthly averages … [t]hus, we are not establishing separate emission standards for these periods because startup and shutdown are part of their routine operations and, therefore, are already addressed by the standards."[42] On the other hand, EPA uses short term performance test results to set the standards rather than the results of long-term CEMS monitoring. As a result, the emissions data on which the standards are based do not, in fact, reflect or adequately accommodate emissions from periods of startup, shutdown, or malfunction.

More generally, EPA proposes to use the 99 percent upper predictive limit ("UPL") to accommodate and reflect variability in the operation of the best performers in calculating the MACT floor. The use of the 99 percent UPL calculated on only a small number of sources in a subcategory does not adequately capture variability or serve to predict the MACT floor level achievable by the top performers. In essence, the Agency is using this statistical method in an attempt to overcome the limited amount of emissions data available for top performers. However, this statistical approach cannot overcome the fact that the data are not representative of the entire population of boilers in each subcategory and that the available data do not reflect the true variability of the top performing sources.

In the final rule, EPA must use data to set the standard that are consistent with the form of the standard. As compliance with the CO standard is to be measured at all times using CO CEMS for units of 100 MMBtu/hr and greater and the averaging time is 30 days, EPA should use 30-day CEMS data from affected boilers to establish the appropriate MACT floors and not 3-run stack test data. To assure that startup, shutdown, and malfunction are appropriately accommodated, EPA must either assure that the data on which the standard is based include representative data from such periods or, alternatively, set a separate work practice standard to properly accommodate startup, shutdown, and malfunction.

Lastly, we identify two statistical errors needing correction. First, instead of using the UPL, EPA should use the upper tolerance limit ("UTL"), which is meant for use in

[42] 75 FR 32013

situations where the available data does not represent the entire population. In addition, since the proposed 99% confidence interval is applied to all 5 HAPs, the combined probability of achieving the set of limits drops to 95%, which is inappropriately low when facilities must be in compliance 100% of the time. EPA therefore should use a 99.9% confidence limit for all standards.

D. EPA Should Establish Health-based Emissions Limitations Under § 112(d)(4) Whenever Appropriate

Section 112(d)(4) authorizes EPA to set health-based emissions limitations when establishing standards for HAPs under § 112(d). Section 112(d)(4) is a powerful tool that enables EPA to match the stringency of a HAP emissions limitation to the level determined necessary to fully protect human health. As a result, the standard is no more stringent and no less stringent than needed to get the job done.

The default technology-based method of setting MACT standards is a cookie cutter approach that can and does result in HAP emissions limitations that are Draconian relative to what is needed to protect the public from HAP emissions. The clear purpose of § 112(d)(4) is to prevent this from happening. The legislative history of § 112(d)(4) is abundantly clear on this point. In formulating § 112(d)(4), Congress recognized that, "For some pollutants a MACT emissions limitation may be far more stringent than is necessary to protect public health and the environment."[43] As a result, § 112(d)(4) was provided as an alternative standard setting mechanism for HAPs "where health thresholds are well-established … and the pollutant presents no risk of other adverse health effects, including cancer…."[44]

When the first Industrial Boiler MACT was promulgated in 2004, it included health-based emissions limitations for two HAPs – hydrogen chloride ("HCl") and manganese. These health-based emissions limitations were rigorous standards that demanded accountability. They were a winner for the Agency and the public because public health would have been protected with an ample margin of safety. At the same time, these standards were a winner for affected sources because the standards would not have blindly required emissions to be reduced far below the levels needed to assure that the public was protected. It was estimated at the time that these health-based standards would have saved over $2 billion in compliance costs, as compared to the technology-based standards that otherwise would have applied.

In the newly proposed Industrial Boiler MACT, EPA acknowledges its authority under § 112(d)(4) to establish a health-based emissions limitation for threshold pollutants in lieu of a MACT emissions limitation. However, the Agency proposes not to establish any health-based emissions limitations "[g]iven the limitations of the currently available information (*i.e.*, the HAP mix where boilers are located, and the cumulative health impacts from co-located sources), the environmental effects of

[43] S. Rep. No. 101-228 (1990) at 171.
[44] *Id*.

HCl, and the significant co-benefits of setting a conventional MACT standard for HCl."[45] Nevertheless, EPA asks for comment on a wide range of issues related to the justification for setting health-based emissions limitations and the method by which they should be set.

Ample scientific information supports a determination that HCl, hydrogen fluoride, hydrogen cyanide, and manganese are threshold pollutants and, thus, are eligible to be regulated under § 112(d)(4). In addition, the Agency has the technical tools and significant factual support for establishing health-based emissions limitations for these HAPs that would provide the requisite ample margin of safety to health and the environment. Thus, health-based emissions limitations are fully justified on scientific and technical grounds. EPA should set health-based emission limitations for HAP acid gases and, as in the 2004 rule, a health-based emissions limit for manganese, which should be implemented in conjunction with a Total Select Metal ("TSM") standard (where the TSM standard would be an alternative to the PM surrogate, and where a "TSM less manganese" option would be provided when a source elects to comply with the health-based compliance alternative for manganese).

From a legal standpoint, the statute makes clear that criteria pollutant co-benefits associated with the proposed MACT standards may not be considered in deciding whether to establish § 112(d)(4) health-based emissions limitations. Also, EPA has failed to explain why the health-based emissions limitations it established in the 2004 Industrial Boiler MACT and the justification provided for those limitations should now be reversed. The preamble to the newly proposed rule sets out a number of questions that might be relevant in deciding whether to establish health-based emissions limitations, but merely asking questions is not a sufficient basis for reversing prior determinations adopted through notice and comment rulemaking. Thus, EPA's proposal not to set health-based emissions limitations runs counter to the law and is based on an inadequate explanation of why the Agency proposes to depart from its prior approach.

E. The Emissions Database Includes Numerous Fundamental Flaws That Compromise the MACT Floor Analysis That is Based on These Data

Given the limited comment period that has been provided on the Industrial Boiler MACT proposal, it simply has not been possible to conduct a thorough data quality assessment on EPA's entire emissions data base. EPA's failure to provide adequate time for an appropriate assessment of the data violates the Agency's obligation to provide a full and fair opportunity for public comment on the proposed rule. Within these severe time constraints, we conducted a spot check of approximately 100 stack test reports and associated information from top performers in order to assess the quality of the data the Agency relied upon in calculating the MACT floors that underlie the proposed rule.

[45] 75 FR 32032.

This spot check revealed numerous data errors – many of which, if corrected, would have a material impact on the stringency of EPA's calculated MACT floors and associated proposed standards. To name just a few, there was: (1) widespread inconsistency in the data reported under the Phase I and Phase II ICRs, such as entirely different methods of determining and reporting "non detects"; (2) inconsistent reporting of dioxin/furan emissions testing results; (3) inconsistent and incompatible PM emissions testing methods; and (4) mischaracterization of boiler types, such as including a coal-fueled boiler in the biomass subcategory. The number and magnitude of the errors provide clear evidence that the database is fundamentally flawed and that any standard derived from the database does not have adequate factual support.

To resolve this problem, EPA must conduct a thorough review of the database, correct or eliminate the flawed data, recalculate the MACT floors and associated proposed standards, and provide a new opportunity for public comments (including sufficient time for commenters to conduct their own comprehensive review of the data).

Along the same lines, the fact that EPA has not finalized the waste definition rule[46] prior to asking for public comment on the Industrial Boiler MACT creates a fundamental procedural problem that is not solved by EPA's alternative MACT proposal.[47] While the waste definition proposal does set forth two basic approaches to distinguishing waste from fuel, the proposal also asks for comments on numerous specific elements of each of these approaches.[48] As a result, the proposal sets out a continuum of possible final rules rather than two distinctly different possibilities. This means that commenters on the proposed Industrial Boiler MACT have no way of knowing what population of units will qualify as boilers upon promulgation of the waste rule and, therefore, cannot conduct a meaningful review of the Industrial Boiler MACT emissions database with regard to the units that ultimately will be used to determine the MACT floors and MACT standards.

The inability to reasonably ascertain which units will actually be used in setting the final Industrial Boiler MACT standards prevents commenters from developing meaningful comments on the emissions database and on EPA's manipulation of the data that ultimately will be used to set the standard. In short, EPA's proposed rule effectively requires commenters to guess what data EPA will eventually use to set the standard. This violates EPA's duty to provide a full and fair opportunity to develop and submit comments on the proposal. This problem can only be cured by

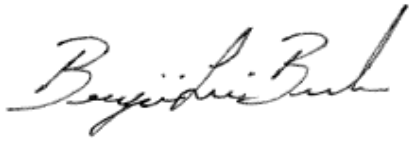
[46] The waste definition rule is proposed at 75 Fed. Reg. 31844 (June 4, 2010).
[47] *See*, 75 FR 32035 ("Alternative Standard for Consideration").
[48] *See*, *e.g.*, *id*. at 31873 ("EPA is proposing that non-hazardous secondary materials used as fuels in combustion units that remain within the control of the generator and that meet legitimacy criteria specified in section VII.D.6 would not be solid waste ….Nevertheless, EPA is seeking comment on whether such secondary materials should be considered solid wastes and thus, be subject to the CAA section 129 requirements if combusted.")

promulgating the waste rule and then proposing industrial boiler standards based on the units that are then known to be industrial boilers.

V. Conclusion

NMA respectfully urges that EPA defer final action on the two rules at issue here until the Agency has produced a cumulative impact assessment. In addition, these comments demonstrate both the need and ability for EPA to revise these industrial boiler proposals to address fundamental technical, legal and data-related issues that subject the proposals to challenge. Owners and operators of industrial boilers and process heaters would be required to invest time and resources into extensive retrofits in order to meet tight compliance deadlines. At a time when the U.S. economy requires every opportunity to recover from the most drastic economic downturn since the Great Depression, the nation's industrial backbone is faced with further impediments. NMA appreciates the opportunity to submit these comments.

Sincerely,



Ben Brandes
Director, Air Quality
National Mining Association

BRUCE WATZMAN
Senior Vice President, Regulatory Affairs

October 1, 2010

VIA ELECTRONIC MAIL TO: a-and-r-docket@epa.gov

U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Attention: Docket ID Nos. EPA-HQ-OAR-2009-0491

Re: *Federal Implementation Plans to Reduce Interstate Transport of Fine Particulate Matter and Ozone*, 75 Fed. Reg. 45,210 (Aug. 2, 2010)

Dear Ladies and Gentlemen:

I. Introduction

The National Mining Association (NMA) submits these comments on the proposed Transport Rule. NMA is a national trade association of mining and mineral processing companies whose membership includes the producers of most of the nation's coal, metals, industrial and agricultural minerals; the manufacturers of mining and mineral processing machinery, equipment and supplies; and the engineering and consulting firms, financial institutions and other firms serving the mining industry. NMA's members mine over 75 percent of the coal produced annually from operations located in 26 states.

NMA's comments are divided into two sections. We first discuss EPA's failure to provide a cumulative impact assessment of the proposed rule in light of all of the various rulemaking activity that the Agency has undertaken that will affect the use of coal in this country and, in turn, the cost and reliability of the nation's electricity supply. We urge the Agency to conduct such an analysis and provide a suggested format. We then comment on the timing of the emission reduction targets set forth in the proposed rule.

II. EPA Must Produce a Cumulative Impact Analysis of Its Regulatory Program Affecting the Use of Coal

A. Overview

As discussed in more detail below, NMA believes that the regulatory analysis supporting the proposed Transport Rule is fatally flawed because it fails to take into account the cumulative impact of all of EPA's now-numerous completed, pending and expected rulemakings that are intended to and will have the effect of substantially reducing the usage of coal in the United States.[1] These rulemakings include those affecting the use of coal for electric generation, where EPA is implementing a coordinated program to create, in its words, a "clean, efficient, and completely modern power sector," those affecting the use of coal for industrial, commercial and institutional purposes, such as the two rules specifically at issue here, and those directly affecting coal mining.

All of these rulemakings together will produce a dramatic and cascading series of effects not only in the coal industry but throughout the economy. There will be direct effects on coal employment and indirect effects on employment generally in the economy as a result of higher energy prices. Higher energy prices will also affect GDP and economic activity generally. American competitiveness will also be affected, as higher prices undermine the ability of American business to compete, with resulting offshoring of American business and jobs.

Impact analysis performed by EPA now proceeds on a rulemaking-by-rulemaking basis, as if one rulemaking is unconnected to the next and as if the regulatory consequences are not cumulative. As a result, EPA's impact analyses mask the cumulative effect of the Agency's overall regulatory program. Individual-regulation impact analyses often predict limited effects, when in truth the overall program may produce extremely large consequences.

This balkanized approach to impact analysis impairs the public's right to notice and comment regarding EPA regulation. For instance, EPA's Regulatory Impact Analysis for the proposed Transport Rule shows relatively minor effects, which might lead the public to believe that the rule is relatively innocuous. Cumulative analysis, on the other hand, could lead to a far different conclusion—that coal usage will decline dramatically as a result of the combined effect of numerous EPA rulemakings with attendant serious economic consequences. Armed with that information, the public would likely provide significantly different comment on the rule.

[1] The draft RIA is fundamentally flawed for another reason as well. On September 1, 2010, EPA published a Notice of Data Availability (NODA) indicating that EPA had changed the assumptions it used in its modeling in support of the proposed rule, with one of the principal changes being changed natural gas supply and price assumptions. EPA, however, did not publish a new draft RIA that reflects the new modeling assumptions. At this point, therefore, the public does not know exactly what the regulatory impacts of the rule will be. NMA will address this point in more detail in its comments on the NODA.

Cumulative impact analysis is not just good policy, it is required by law, both by Executive Order 12866 and the notice and comment rulemaking provisions of the Clean Air Act ("CAA"). NMA therefore urges EPA to defer final action on the two rules at issue here until the necessary cumulative impact assessment is produced. The specific type of analysis that NMA recommends is set forth as an attachment to these comments.

B. Cumulative Analysis Is Needed

1. EPA's coordinated regulatory agenda to reduce coal usage

EPA has undertaken a far-reaching regulatory program that is apparently designed to reduce the use of coal throughout the American economy. The coordinated nature of this program is most evident in the electric power sector, which EPA has undertaken to transform. Upon taking office, EPA formulated seven priorities, one of which was to "develop a comprehensive strategy for a cleaner and more efficient power sector, with strong but achievable reduction goals for SO_2, NO_2, mercury and other air toxics."[2] This goal was reiterated by EPA in the proposed Transport Rule, where the Agency said that "[i]n furtherance of this priority goal, and to respond to statutory and judicial mandates, EPA is undertaking a series of regulatory actions over the course of the next 2 years that will affect the power sector in particular."[3]

These EPA rulemakings include:

- The recently completed National Ambient Air Quality Standards ("NAAQS") for sulfur dioxide ("SO_2") and nitrogen dioxide ("NO_2");

- The currently proposed new ozone NAAQS and the soon-to-be-proposed new $PM_{2.5}$ NAAQS;

- The proposed Transport Rule and expected additional transport rules for the 1997 ozone NAAQS, the currently proposed new ozone NAAQS, and the soon-to-be-proposed new $PM_{2.5}$ NAAQS;

- The soon-to-be-proposed MACT standards for electric generating units ("EGUs");

- EPA's greenhouse gas ("GHG") regulation under the Prevention of Significant Deterioration ("PSD") program;

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[2] *Federal Implementation Plans to Reduce Interstate Transport of Fine Particulate Matter and Ozone*, 75 Fed. Reg. 45,210, 45,227/3 (August 2, 2010), quoting the EPA Administrator's January 12, 2010 outline of the Agency's seven priorities.

[3] *Id.*

- The soon-to-be-proposed New Source Performance Standards for EGUs (including GHG NSPS);

- Best Available Retrofit Technology ("BART") standards for EGUs;

- The proposed regulations for coal combustion residues; and

- The soon-to-be-proposed water quality regulations for cooling intake structures and soon-to-be-proposed effluent guidelines for discharges from power plants.

Recognizing that all of these regulations are implementing a single overall priority goal and constitute a "comprehensive set of requirements,"[4] EPA pledged in the proposed Transport Rule to coordinate at least its power sector air quality regulations and, to the extent it could under relevant statutory law, to coordinate these power sector air quality regulations with the coal combustion residue regulations and the two power sector water quality regulations.[5] EPA further pledged to "engage with other federal, state and local authorities, as well as with stakeholders and the public at large, with the goal of fostering investments in compliance that represent the most efficient and forward-looking expenditure of investor, shareholder, and public funds, resulting, in turn, in the creation of a clean, efficient, and completely modern power sector."[6]

EPA's regulatory agenda for the power sector will almost certainly significantly reduce the use of coal for electric generation. While EPA so far has not done any study of the cumulative impact of these regulations on coal use (or otherwise), the contractor EPA uses to model impacts of individual regulations recently produced its own analysis showing that just the EGU MACT standards alone will force major retirements of coal-fueled powerplants.

A recent report by Credit Suisse (copy attached) examined the effect of the Transport Rule and the upcoming EGU MACT rules and determined that:

- About 60 GW of coal-fueled capacity will likely close between 2013 and 2017.

- $70-$100 billion of capital expense in emission control equipment.

- A 15-31% reduction in the use of coal for electric generation.

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[4] *Id.*

[5] *Id.*

[6] *Id.*

- MISO, SERC, PJM-West, and SPP will see an "accelerating reversion to 15% reserve margins."

- EPA's standards cannot be met unless compliance deadlines are extended to 2017.

Forced retirements will have substantial negative economic impacts nationally, but will also have severe impacts locally, as exemplified by the Arizona Hopi and the Navajo Generation Station:

> Scott Canty, the Hopi Nation's general counsel, explained to a panel of lawmakers on Nov. 2 that closure of the Navajo Generating Station would cripple the tribal government. The Hopi Nation relies heavily on coal revenues to fund its government, Canty said. About 88 percent of the tribal government's budget comes from revenue generated by coal-fired energy production at the Navajo Generating Station, Canty said. . . . The EPA has proposed rules that would require the power plant to install expensive emissions equipment to address visibility impairment issues at the Grand Canyon. But the plant's owners and the tribes argue that the retrofit is too costly.[7]

Moreover, news accounts recently reported that EPA is well aware that its regulatory efforts in the power sector will increase the costs to coal-fueled EGUs and make them less competitive with renewable resources. In an article entitled "Administration Eyes EPA Rules To Spur Shift From Coal To Renewables," it was reported that:

> Rob Brenner of EPA's Office of Air & Radiation told a July 28 meeting of the agency's environmental justice advisers that pending rules to control emissions, waste and water discharges from utilities will not only protect public health but add costs to the industry that might make renewable energy a more viable alternative.
>
> "We need to set health-based standards for power plants, and once we do that then they can compete with some of these renewable sources," Brenner said at the National Environmental Justice Advisory Committee (NEJAC) meeting in Washington, DC. He added later, "It's not

[7] Luige del Puerto, *Hopi Nation in Arizona appeals for help as coal plant face disclosure,* ARIZ. CAP. TIMES, Nov. 3, 2009, *available at* http://www.allbusiness.com/government/government-bodies-offices-regional/13389633-1.html.

> really a fair competition because [coal-fired power plants] are cheaper than they should be because they're not controlling their pollutants" to their full extent because EPA is yet to issue key rules for the sector, including a mercury air rule and a plan to regulate coal combustion residue.[8]

The same article reported that the White House also understands that transforming the power sector will inevitably result in reduced use of coal and increased use of renewables. Referring to remarks of Nancy Sutley, Chair of the White House Council on Environmental Quality, the article reported that:

> Sutley responded that she doubts the existence of so-called clean coal. "Other people have labeled it 'clean coal,'" she said. "I don't know if I would necessarily concede that that is real. . . . I think in the long run, not just for the [United States] but for the world, that developing and making sure that there is access to these inherently cleaner sources of energy is important. . . . . We need to use energy more efficiently and more cleanly."[9]

Other EPA regulatory proposals are also part of an overall strategy to reduce the use of coal throughout the economy. This strategy includes the Boiler MACT and Area Source rule on which EPA recently took comment. In the regulatory preamble to the Boiler MACT rule proposal, EPA stated forthrightly that its reason for proposing strict MACT standards for coal boilers and process heaters but only work practice standards for natural gas boilers was to incent coal boilers to switch to natural gas and to disincent natural gas boilers from switching to coal.[10] In discussing this issue, EPA made plain that it considers coal to be a "dirty" fuel whose use is inconsistent with the CAA and therefore should be discouraged.[11] In contrast, EPA considers natural gas to be a "clean fuel" whose use should be encouraged at coal's expense. According to EPA:

> In addition, emission limits on gas-fueled boilers and process heaters may have the negative effect of providing

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[8] *Administration Eyes EPA Rules to Spur Shift from Coal to Renewables*, InsideEPA.com (July 29, 2010), *at* http://insideepa.com/201007291915893/EPA-Daily-News/Daily-News/administration-eyes-epa-rules-to-spur-shift-from-coal-to-renewables/menu-id-95.html.

[9] *Id.*

[10] *National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters*, 75 Fed. Reg. 32,006, 32,025/3 (June 4, 2010).

[11] *Id.*

an incentive for a facility to switch from gas (considered a "clean" fuel) to a "dirtier" but cheaper fuel (i.e., coal).[12]

The coal industry also faces a panoply of prospective regulation of the process of producing coal. These regulations include potentially stricter NAAQS for PM_{10} which may make western surface mining untenable, new restrictions on coal mine permitting in Appalachia that could result in major reductions in surface and underground coal mining in that region, and potential imposition of NSPS standards on mining emissions of PM_{10}, methane, volatile organic compounds, and nitrogen oxides. All of these regulations together—EPA's power sector regulations, its regulations for the use of coal in the manufacturing and commercial sectors, and its regulations of coal mining—all have the potential to combine to cumulatively and dramatically reduce coal usage.

2. The effect of each EPA individual rule affecting coal, including the rules at issue here, cannot be understood without a cumulative analysis

Given EPA's intent to transform the power sector from what it is today into something different and given its efforts to reduce coal use throughout the economy, EPA must produce a cumulative and economy-wide assessment of this program. As EPA has proposed and finalized each individual regulation, including the proposed Transport Rule, EPA's impact analysis has been limited to the effect of the specific regulation in question. However, to understand the effect that all the rules together will create, it is necessary to study the effect of that program in toto.

These effects could be extremely large. For instance, EPA projects the annual cost of the SO_2 NAAQS to be $2.9 billion to $3.0 billion in 2020, with most of those costs associated with the power sector[13]; the annual cost of the Transport Rule (all in the EGU sector) to be $3.7 billion in 2012 and $2.8 billion in 2014,[14] with another $2 billion in 2020 and 2025[15]; the annual cost of the ozone standard to be $32 – 44 billion, again with much of that cost in the EGU sector[16]; and the total costs of the coal combustion residue rule to be over $8 billion under the Subtitle D option and

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[12] *Id.*

[13] U.S. Environmental Protection Agency, *Final Regulatory Impact Analysis (RIA) for the SO2 National Ambient Air Quality Standards (NAAQS)* at 7-4, Table 7.1, June 2010 (Docket ID EPA-HQ-OAR-2009-0769-0059).

[14] 75 Fed. Reg. at 45348/1.

[15] *Id*. at 45333, TableV.E-1.

[16] U.S. Environmental Protection Agency, *Final Ozone National Ambient Air Quality Standards (NAAQS) Regulatory Impact Analysis* at 5-23, March 2008 (Docket ID EPA-HQ-OAR-2005-0161-2849) (estimate for 0.065 ppm standard; EPA's proposal is 0.060-0.070).

over $20 billion with the Subtitle C option.[17] Despite the request from NMA and others for EPA to assess the cost of its GHG regulatory program, EPA has refused to do so, and so that cost is unknown but could be very substantial as well. The other programs identified above will also add significant cost, with the new EGU MACT standards expected to have a potentially a very large impact.

But these estimates, as large as they are, mask the overall effect of the regulations when considered cumulatively. The proposed Transport Rule is an example. EPA's draft Regulatory Impact Analysis ("RIA") for this proposed rule envisions relatively small impacts to coal usage. EPA projects that EGUs can meet the requirements of the rule by switching from high sulfur to low sulfur coal and by installing pollution control equipment, with the result that EPA estimates the retirement of only 1.2 GW of "small and infrequently used" coal-fired generating units by 2014.[18] Based on the foregoing, EPA projects additional cost to the utility industry of $3.7 billion in 2012 and $2.8 billion in 2014 ($2006).[19]

This EPA projection of almost no impact to the coal industry, however, is not meaningful because it is based on an analysis of the Transport Rule in isolation. Thus, even if EPA's projected assessment of the effect of the Transport Rule on coal is correct, that assessment assumes that there are no other forthcoming EPA regulations that will affect the use of coal, an

[17] *Hazardous and Solid Waste Management System; Identification and Listing of Special Wastes; Disposal of Coal Combustion Residuals From Electric Utilities*, 75 Fed. Reg. 35218, 35134, Table 1 (June 21, 2010).

[18] U.S. Environmental Protection Agency, *Regulatory Impact Analysis for the Proposed Federal Transport Rule* at 14, June 2010 (Docket ID EPA-HQ-OAR-2009-0491-0078).

[19] *Id*. at 31.

> assumption that is clearly wrong. The control options that the Transport Rule RIA envisions appear to exhaust (and likely go beyond exhausting) the ability of the power sector to absorb EPA regulation without large-scale closings of coal plants. The next regulation following the Transport Rule that adds cost to coal-fueled electric generation therefore will force plant closings, but it is incorrect to say that it was that next regulation and not the Transport Rule that causes the plant closings. Both rules and indeed the entire program cause that effect.

EPA itself recognizes the need for cumulative analysis in an analogous situation. EPA requires that EPA reviewers of Environmental Impact Statements ("EISs") under the National Environmental Protection Act ("NEPA") take cumulative impacts into account, including consideration of "impacts that are due to past, present, and reasonably foreseeable actions."[20] According to EPA, in assessing environmental impacts, it is necessary to assess "[t]he combined, incremental effects of human activity" rather than just the impacts of the particular action for which federal approval is sought.[21] This is based on the recognition that individual actions "may be insignificant by themselves," but that cumulative impacts accumulate over time, from one or more sources and these cumulative effects must be taken into consideration.[22]

The Council on Environmental Quality ("CEQ") also requires cumulative impact analysis in EISs. CEQ regulations require that agencies considering major actions that could affect environmental quality consider the "overall, cumulative impact of the action proposed (and of further actions contemplated)."[23]

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[20] U.S. Environmental Protection Agency, *Consideration of Cumulative Impacts in EPA Review of NEPA Documents* (May 1999) at 10.

[21] *Id*. at 1.

[22] *Id*.

[23] 35 Fed. Reg. 7390, 7391 (1970). It should be emphasized that CEQ does not distinguish between cumulative analysis of environmental impacts and of socioeconomic impacts. Under CEQ regulations, agencies must examine the effect of the proposed action on the "human environment." 40 C.F.R. § 1508.14 states that "[h]uman environment" shall be interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment." While "economic or social effects are not intended by themselves to require preparation of an environmental

EPA's and CEQ's reasons for requiring cumulative impact analysis in EISs apply with equal force to economic analysis that EPA performs of its regulations. Where effects of a proposed action accumulate with those of other related actions, examining the effects of the proposed action in isolation will mask the overall effect of the action. That is as true for EPA's regulatory efforts to reduce coal usage as it is for environmental analysis in the NEPA context. To again cite the proposed Transport Rule as an example, as stated, EPA concludes that the rule will not materially affect the use of coal for electric generation.[24] But under the rationale of CEQ's NEPA regulations, cumulative impact analysis should be conducted because "[c]umulative impacts can result from individually minor but collectively significant actions taking place over a period of time."[25]

C. Cumulative Analysis is Legally Required

Cumulative analysis does not just make good regulatory sense; it is legally required. Two separate authorities require cumulative analysis here.

1. Executive Order 12866

Executive Order 12866 specifically requires cumulative analysis as follows:

> Each agency shall tailor its regulations to impose the least burden on society, including individuals, businesses of differing sizes, and other entities (including small communities and governmental entities), consistent with obtaining regulatory objectives, taking into account, among other things, and to the extent practicable*, the costs of cumulative regulations.*[26]

This requirement for cumulative analysis stems from the regulatory philosophy of Executive Order 12866 that the need for and effects of government regulatory actions should not be examined in isolation but instead on an overall and coordinated basis. The preamble to the Order found that the then current regulatory system did not work in a way that produced efficient results or regulations that were "effective, consistent, sensible, and understandable."[27] The

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impact statement," "[w]hen an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment." This applies to cumulative analysis: where socioeconomic effects accumulate from multiple actions, they must be assessed cumulatively, just as environmental effects must be assessed cumulatively. Thus, cumulative analysis is as relevant for examining socioeconomics as it is for analyzing environmental impacts.

[24] 75 Fed. Reg. at 45357/1.

[25] 40 C.F.R. § 1508.7.

[26] Exec. Order No. 12,866, 58 Fed. Reg. 51735 (Sep. 30, 1993) (emphasis added).

[27] *Id*.

first objective of the Order, therefore, was to "enhance planning and coordination with respect to both new and existing regulations."[28] In that vein, the main administrative provisions of the Order—an interagency Planning Mechanism, the requirement that each agency produce a Unified Regulatory Agenda and develop a Regulatory Plan, the requirement for a Regulatory Working Group and the provision for quarterly Conferences among OIRA and state, local and tribal governments—were all included to enhance coordination of any specific regulation proposed by an agency with that agency's other existing and contemplated regulations, with other regulations of other agencies, and with the President's overall regulatory priorities.[29]

The Statement of Regulatory Philosophy and Principles in Executive Order 12866 also stressed the need for coordination. This Statement provides that "[i]n deciding whether and how to regulate, agencies should assess *all* costs and benefits of available regulatory alternatives."[30] Agencies are instructed to "examine whether existing regulations (or other law) have created, or contributed to, the problem that a new regulation is intended to correct and whether those regulations (or other law) should be modified to achieve the intended goal of regulation more effectively"[31]; to "base its decisions on its best reasonably obtainable scientific, technical, economic, and other information concerning the need for, and consequences of, the intended regulation"[32]; and to "avoid regulations that are inconsistent, incompatible, or duplicative with its other regulations or those of other Federal agencies."[33] Indeed, the preamble to the Executive Order states that "[t]he objectives of this Executive order are to enhance planning and coordination with respect to both new and existing regulation…."[34]

This requirement for coordinated government action based on coordinated and cumulative analysis built on the same requirement in Executive Order 12291, the predecessor order to Executive Order 12866 and the Order which first required agencies to prepare Regulatory Impact Analyses. Executive Order 12291 required agencies, in promulgating new regulations, to "tak[e] into account the condition of

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[28] *Id*.

[29] *Id*.

[30] *Id*. (emphasis added)

[31] *Id*. at 51735-36.

[32] *Id*. at 51736.

[33] *Id*.

[34] *Id*. at 51735.

the particular industries affected by regulations . . . *and other regulatory actions contemplated for the future*."[35]

The Executive Order 12866 requirements for coordinated and cumulative analysis apply with particular force to EPA's efforts to remake the power sector and its apparent effort to reduce coal usage throughout the economy. As shown above, each individual regulation that EPA promulgates in this area, including the Transport at issue here, is part of a single overall program with cumulative consequences.

Moreover, EPA cannot say that cumulative analysis is not "practicable" within the meaning of section 1(b)(11) of Executive Order 12866. EPA obviously has very sophisticated modeling techniques at its disposal. If in any one rulemaking EPA believes that it cannot anticipate and therefore assess the effects of future rulemakings, EPA can assess a range of possible future regulation. Certainly, the fact that EPA has indicated that it has an overall program in furtherance of one of the Agency's seven priorities suggests that EPA has a fairly concrete idea of the range of regulatory outcomes that it anticipates. Alternatively, EPA can delay any particular rulemaking until it has better information about future regulatory requirements that it intends to impose. What EPA cannot do, however, is to follow its current regulatory course, where the Agency analyzes individual rulemaking effects in isolation, as if there is no overall regulatory context.

2. CAA

Cumulative impact analysis is also legally required under the rulemaking provisions of the CAA where, as here, EPA has undertaken coordinated and comprehensive regulation of the power and coal sectors through a series of related rulemakings. The purpose of these CAA rulemaking provisions is both to ensure good regulatory outcomes and to protect the public's right to have adequate notice of the need for and effect of EPA regulatory action so that the public can provide meaningful comment.

In this context, section 307(d)(3) of the CAA requires that a rule be accompanied by a statement of its basis and purpose, including "the major legal interpretations and *policy considerations* underlying the proposed rule."[36] For the reasons discussed above, an underlying policy consideration of the Transport rule at issue here is EPA's overall intent to incent reductions in coal usage and increases in resources that EPA considers to be "clean." That being the case, EPA must provide an analysis of the consequences of this policy so that the public can comment adequately. As stated, the coal industry and public at large might have an entirely

[35] Exec. Order No. 12,291 at § 2(e) (emphasis added).

[36] 42 U.S.C. § 7607(d)(3) (emphasis added).

different view of these proposed rules if EPA produced a cumulative assessment rather than the narrow assessment reflected in the RIA.

> The U.S. Court of Appeals for the D.C. Circuit has stated that "[i]t is not consonant with the purpose of a rulemaking proceeding to promulgate rules on the basis of inadequate data, or on data that, [in] critical degree, is known only to the agency."[37] Unless the public knows the overall consequences of EPA's regulations in context of other related regulations, the public's right to provide adequate comment is compromised.

Additional support for cumulative analysis is found in section 318 of the CAA, which requires that the Administrator undertake an analysis of the cost of complying with various EPA actions, including rulemakings under section 111(d). Under section 318(d), such analyses "shall be as extensive as practicable" consistent with the standards set forth in that provision.[38]

D. Scope and Content of a Cumulative Impact Assessment

NMA believes that the cumulative impact assessment should examine the following factors.

- Overall impacts on the economy. Specifically, the effect on GDP and jobs. In this regard, some of EPA's regulations (in particular, the NAAQS) will not just affect energy but will affect other sectors of the economy as well both directly (for example, through direct regulation of manufacturing sources) and indirectly (for example, through increased energy costs). EPA should examine all reasonably foreseeable effects of its regulations on the overall economy.

- Energy. This part of the analysis should include impacts on energy production and usage, energy costs, including fuel costs and retail electricity prices, and energy employment should be determined. Changes in the energy mix in the United States should be shown over time, including electric capacity additions and reductions by fuel type. Employment and energy cost impacts should be estimated for each energy sector.

[37] *Portland Cement Ass'n v. Ruckelshaus*, 486 F.2d 373, 393 (D.C. Cir. 1973), *cert. denied* 417 U.S. 921 (1974).

[38] 42 U.S.C. § 7617(d).

- Competitiveness. This part of the analysis should include impacts on industrial and manufacturing production and competitiveness. EPA should determine the impacts of regulation on cost of production and employment in the relevant sectors, and the extent to which production and jobs will be reduced as a result of higher costs and foreign competition.

- Study design. Scenarios should be constructed for a business-as-usual case (without adoption of the contemplated regulations) and a case where EPA adopts the contemplated regulations. Additional scenarios may be included to test the findings under different appropriate assumptions. Where EPA regulation does not directly regulate but instead requires states to adopt regulations meeting EPA standards (for instance, EPA regulation under the NAAQS program and NSR/PSD program), EPA should estimate state regulatory responses, using a range if necessary. All assumptions, analytical methods and underlying data (or appropriate citations to data sources) should be provided. All impacts should be broken down on a state-by-state basis. Regulations included in the study should not be limited to just those listed in NMA's comments but should include any other EPA regulations that EPA believes will affect the nation's economy, production and usage of energy and manufacturing.

III. Other Comments

A. EPA Has not Provided an Adequate Opportunity for Comments

Apart from the cumulative impact assessment issue, EPA has made it very difficult, indeed impossible, to provide meaningful comments on the proposed rule. In the first place, EPA's intention to begin phase one of the proposed rule in 2012 resulted in an insufficient time for comments, only sixty days despite the extraordinarily complex nature of the proposed rule and the underlying analysis that supports the rule. NMA counts more than 20 Technical Support Documents as well as numerous modeling files in the record. In particular, the modeling and the assumptions underlying the modeling drive all facets of the rule, including the air quality analysis and the determination of individual state significant contributions to downwind non-attainment or interference with maintenance, and this in turns drives calculation of state budgets and whether states are classified as group 1 or group 2 states. Sixty days is not enough time to analyze and understand this material.

The Agency should not provide an inadequate amount of time to comment because of a self-imposed and impractical deadline to begin regulation. But the 2012 deadline is not feasible—and its extension would provide the collateral benefit of allowing the public more time to understand this complex rulemaking and to provide useful comment to the Agency.

The insufficient time to comment is compounded by EPA's September 1, 2010 Notice of Data Availability (NODA), which indicates that EPA has made fundamental changes to the assumptions used in the modeling to support the rule. These changes evidently are sufficient to change EPA's air quality analysis and cost-

effectiveness analysis and therefore the emission budgets and even potentially whether states are classified in group one or two. Indeed, even at this point EPA has not fully explained how its proposal has been changed by the new modeling assumptions, as EPA says that the state budgets "have not been modified to account for any changes that the modeling might suggest."[39]

In essence, the comments that EPA has called for as of October 1, 2010 pertain to an obsolete proposal, one that is different from the one that EPA is now considering and one that still has not been fully explained. But since the public has not yet had an opportunity to examine and fully understand the NODA, the public cannot be sure in exactly what ways the original proposal on which it is now commenting may or may not remain valid.

In these circumstances, it would have been far better for EPA to have delayed the entire comment period so that the public had at least an additional sixty days to comment on the entire rule after publication of the NODA. But with phase one of the rule nearing, EPA evidently concluded that there was insufficient time to do so. This problem could have been solved had EPA proposed the Transport Rule sooner and, when it did so, the Agency had completed its underlying analysis, and therefore the proposal itself. The problem can still be solved if EPA will delay the phase one requirements, a course it should do anyway given the lack of feasibility of the phase one requirements.

B. 2012 Is Too Soon to Begin Phase One Regulation, and 2014 Is Too Soon to Begin Phase Two Regulation

1. 2012

EPA proposes to require compliance with phase one requirements under the proposed rule at the beginning of 2012, just six or so months after EPA anticipates completion of the rule.[40] This is wholly unrealistic. States will not have had an opportunity to examine and understand the final rule and adopt State Implementation Plans (SIPs), and sources will not have had an adequate opportunity to plan for the new requirements.

The phase one emission reduction obligations are significant. EPA indicates that the 2012 SO2 emission reductions required under the rule will be 4.1 million tons per year, as compared with 5.1 million tons that would be expected otherwise.[41] EPA evidently believes that this significant amount of emission reductions is feasible by the beginning of 2012 because, in EPA's analysis, sources will not be required to

[39] *See* 75 Fed. Reg. at 53614/3.
[40] EPA states that it anticipates issuance of the final rule in "June." *See* slide 22 of "Overview Presentation 7/26/2010," http://www.epa.gov/airquality/transport/actions.html.

[41] *Id.,* slide 33. In a presentation by EPA held after the rule was proposed, EPA said that the 2012 cap under the rule would be 3.9 million tons, a difference that, so far as NMA is aware, has not been resolved.

install new pollution control equipment, beyond those already planned and in development, to meet the requirements of the rule. Instead, EPA believes that the rule's NO_X requirements can be met by operating NO_X control equipment year round, and the rule's SO_2 requirements can be met principally through coal-switching from high sulfur to low sulfur coal and from low sulfur coal to very low sulfur coal.

NMA understands that utility industry commenters will provide significant information showing that EPA has made factual errors in the modeling inputs that were used to demonstrate that the phase one emission reduction reductions could be achieved by the beginning of 2012. For instance, NMA understands that this information will show that EPA has overstated the number of scrubbers that are under construction and will be operational by 2012. If EPA's information is wrong, then the only way the 2012 budgets can be met are by closing units or ramping down production, a result that would fundamentally change the cost-effectiveness of the rule.

Moreover, NMA is unable to find any documentation in the record of whether EPA considered whether utilities are constrained by coal supply or rail contracts from switching coal suppliers or coal sources. Many coal and rail contracts extend for a period of years, in many cases for five or ten years or longer. Certainly, as of mid-2011 when the Transport Rule is final, many utilities will be contractually locked into their sources of coal for the 2012-14 period and will therefore be unable to switch coal as EPA anticipates. If they are unable to do so, the 2012 budgets will be unattainable, except by closing coal-fueled units or ramping back production, which in turn will produce different impacts than those that the Agency has analyzed. EPA must at least produce some form of analysis taking into account coal supply and rail contract constraints.

Similarly, NMA is unable to find any documentation in the record of whether EPA considered any physical constraints on substitution of one type of coal for another, except where the switch would entail substitution of very low sulfur subbituminous coal for bituminous coal. But many other types of coal characteristics affect whether coal can be burned in a particular unit even for coal within a single coal region. Unless EPA produces a unit-by-unit analysis demonstrating that coal can be substituted in the manner that EPA anticipates, there will be no certainty that utilities can meet the 2012 compliance deadline through coal-switching and that unit closures or reductions in operations will not be required.

2. 2014

For compliance with the 2014 SO_2 budgets, EPA projects the installation of scrubbers on 14 GW of generation, in addition to the very substantial amount otherwise planned for that period. For NO_X compliance in 2014, EPA projects the addition of SCRs on 51 GW of capacity. EPA expresses confidence that utilities can install scrubbers on 14 GW of capacity during the three year period between 2011

when the Transport Rule goes into effect and 2014 because utilities installed more than that amount of scrubbers in past three-year periods in response to CAIR. But that statement ignores the fact that EPA expects utilities to install scrubbers on an additional 26 GW of capacity by 2014 under what EPA calls other requirements.

This is a great deal of construction activity in a very limited amount of time. In the first place, since EPA has overstated the number of scrubbers that will be brought on line by the beginning of 2012, it has underestimated the number that must be brought on line between 2012 and 2014. Based on comments that will be submitted by utility industry entities, industry estimates show that approximately 25 GW of *new* scrubbers will be required by 2014, not the 14 GW assumed by EPA.

Moreover, NMA understands that utility industry commenters will also be providing information showing that EPA has severely underestimated the time it takes to plan for, design and engineer, and construct scrubbers and SCRs. For example, EPA's estimate that a scrubber can be brought on line in 30 months is based on general industry information taken from a period that did not experience the extremely high volume of scrubber construction that EPA projects in the 2012-14 time period, and the even higher volume of construction that will likely take place in actuality. Furthermore, using general figures masks difficulties that may arise at individual locations. Yet EPA's ambitious schedule requires that every scrubber project be completed by 2014, not just a hypothetical "average" project.

As with EPA's assumptions on coal-switching, if EPA is wrong about the amount of scrubbers that can be installed by 2014, the result will be the closing of coal plants or the ramping down of production at those plants. That result, which EPA has not analyzed, would completely change the basis for EPA's conclusion that its phase two emission reductions are cost-effective.

C. EPA's 2012 and 2014 Deadlines Result in the Usurpation of State Authority under the Clean Air Act

The federalist nature of the Clean Air Act is well-established. EPA sets standards, and states implement those standards through SIPs. Only if states do not submit an adequate SIP may EPA step in and impose a Federal Implementation Plan (FIP).

Under Section 110(c)(1), EPA may impose a FIP within two years after EPA (a) finds that a state has failed to make a required SIP submission or finds that the SIP does not satisfy the minimum criteria under section 110 or (b) disapproves a SIP, unless the State corrects the deficiency. Under Section 110(k)(5), if EPA finds that a SIP fails "to mitigate adequately pollution transport" as may be found by EPA under Sections 176A or 184, "[t]he Administrator shall require the State to revise the plan as necessary to correct such inadequacies." Further, "[t]he Administrator shall notify the State of the inadequacies, and may establish reasonable deadlines … for the submission of such plan revisions."

Thus, where as here, EPA has made findings that states are significantly contributing to the interstate transport of pollution, the required procedure is for EPA to so notify the states and to give them an adequate opportunity to submit a SIP revision. If those SIP submissions are inadequate, EPA may impose a FIP. Here, EPA has improperly reversed the procedure and skipped directly to imposition of a FIP.

EPA's reason for doing so, again, is its rush to begin phase one as of 2012. But EPA's policy interest does not permit it to ignore plain statutory language. Moreover, EPA's statement that imposition of FIPs "would in no way affect the rights of states to submit … a SIP that replaced the federal requirements of the FIP with a state requirement"[42] has it exactly backwards. The opportunity for a SIP precedes the FIP; it doesn't follow it.

EPA seeks to justify immediate imposition of FIPs on the ground that EPA, as a part of CAIR, found that states were significantly contributing to downwind NAAQS non-attainment and therefore already had been given more than the required amount of time to submit conforming SIPs. But, as EPA recognizes, the states fully complied with the requirements that EPA imposed. As EPA states, following EPA's interstate transport findings, EPA in CAIR called for states to cure their SIP deficiencies by submitting SIP revisions that complied with the standards set forth in CAIR. The states did so, and EPA approved their SIPs. The only reason why states could be said to be in violation of CAA interstate transport requirements is because CAIR was overturned in Court. But that was not the state's fault; it was EPA's. Case law supports a "resetting of the deadline clock" where, as here, states cannot meet their statutory obligations because of EPA's failure to carry out its CAA responsibilities. *NRDC v. EPA,* 22 F.3d 1125 (D.C. Cir. 1994).

In short, EPA's imposition of FIPs is improper. EPA should extend the time for compliance with its phase one and two requirements and allow states adequate time to formulate conforming SIPs.

D. The Direct Control Remedy Option Also Usurps State Authority

EPA requests comments on the option of EPA imposing a Direct Control Remedy on individual units by assigning them emission rates. As discussed, however, EPA does not have authority to bypass SIPs and impose specific requirements on individual units. In remedying significant contributions by *states* to downwind attainment under section 110, EPA may impose emission reduction obligations on *states*—but not on individual units.

E. No Need Exists to Enforce More Stringent Requirements than CAIR

[42] 75 Fed. Reg. at 45,342/2.

Despite generating more and more electricity, the electric utility has made steady and continuous progress in reducing emissions. According to EPA data, SO_2 emissions from powerplants declined by 67 percent from 1980 to 2009, and NO_X emissions declined by 72 percent over the same period. Just in the East, NO_X emissions during the ozone season declined by 80 percent.

This progress will continue at the CAIR level of reductions. CAIR was widely supported both by environmental groups and industry. It unraveled principally because of its interstate trading component. But the Court did not require EPA to produce more emission reductions than the CAIR amounts. CAIR was a reasonable program when promulgated, and nothing has happened since it was promulgated to justify further reductions. To the contrary, with the economic situation, load growth and the demand for electricity has flattened. The country has also undertaken a variety of new initiatives to foster renewable resource development.

As discussed above, the feasibility of the 2012 and 2014 emission reductions required by the proposed rule are assumption and model driven—if the assumptions are wrong, the feasibility of the whole program is in doubt and the economic cost the program will rise dramatically. EPA has left the public very little time to challenge (or even understand) these assumptions, and it has left almost no time between finalization of the rule and the 2012 compliance deadline for reconsideration of the rule if the assumptions prove to be faulty. Yet EPA already has in place a program that will lead to an acceleration of the emission reductions that the country has made in the last three decades.

F. EPA Should Use the "Monitored-Plus-Modeled" Approach

Departing from its approach in the NOX SIP Call and CAIR, the proposed rule does not use a combination of monitored and modeled data to determine the downwind nonattainment areas that must be addressed under the rule. Instead, it uses only modeled data. This departure from the approach used in the two previous rules is not explained. The previous approach, however, was preferable because the purpose of the Transport Rule is to remedy real world nonattainment, not hypothetical nonattainment shown by a model. EPA should either return to its previous approach or explain its reasoning for the new approach.

G. The Proposed Rule Does not Assume Sufficient Emission Reductions from Local Controls

The premise behind the proposed rule is that, to cure nonattainment or preserve attainment, upwind sources should control first, then downwind sources should address any remaining problem. As EPA stated, "EPA continues to believe that a strategy based on adopting cost effective controls on sources of transported

pollutants as a first step will produce a more reasonable, equitable, and optimal strategy than one beginning with local controls."[43]

In the court decision overturning CAIR, however, the court ruled that EPA's notions of what is "reasonable," "equitable," or "optimal" are irrelevant in applying the CAA.[44] Congress determines what is the "reasonable," "equitable," and "optimal strategy for addressing nonattainment and interference with maintenance; EPA then carries out Congress' wishes. Section 107(a) of the CAA plainly states that "[e]ach State shall have the primary responsibility for assuring air quality within the entire geographic area comprising such State." EPA thus has it exactly backwards—under the statute, the nonattaining state must first seek to achieve attainment through local controls, and the upwind states may then be required to address any remaining increment of nonattainment.

EPA's flawed legal analysis is reflected in its base case modeling. That modeling does not assume any further controls on local sources. Had new local controls been assumed, the burden on upwind sources would have been reduced. Moreover, EPA's Emission Inventory TSD states that modeling of the 2014 control case is indeed intended as a complete remedy for nonattainment ("The 2014 TR Control Case was intended to represent the implementation of NO_X and SO_2 reductions to attain the existing ozone and $PM_{2.5}$ NAAQS in the eastern U.S.").[45]

EPA's policy requiring upwind states to go first is based on the Agency's conclusion that upwind controls are lower cost than local controls. Whether or not this is true, it is irrelevant under the CAA. The notion that (presumably) lower cost controls in upwind states should be installed before (presumably) higher cost local controls derives from the Agency's views of interstate equity, a concept that the *North Carolina* court specifically found to be beyond the scope of EPA's power to implement under the CAA. Thus, EPA should at least have modeled a reasonable level of local controls to achieve and maintain attainment, a level that cannot be determined with reference to the cost of upwind controls.

IV. Conclusion

NMA respectfully urges that EPA defer final action on the proposed Transport Rule until the Agency has produced a cumulative impact assessment. Specific recommendations for such an assessment are provided. NMA also urges EPA to change the compliance deadlines in the proposed rule to more reasonable ones and to allow states an opportunity to submit SIPs. NMA appreciates the opportunity to submit these comments.

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[43] 75 Fed. Reg. at 45,226/2.

[44] *North Carolina v. EPA*, 531 F.3d 896, 919 (D.C. Cir. 2008), *modified on petitions for rehearing*, 550 F.3d 1176 (D.C. Cir. 2008).

[45] Technical Support Document (TSD) for the Transport Rule, Docket ID No. EPA-HQ-OAR-2009-0491, Emissions Inventories, June 2010, at 37.

Sincerely,

Bruce Watzman
Senior Vice President – Regulatory Affairs

FBR Research

Utilities

Marc de Croisset
646.885.5423
mdecroisset@fbr.com

Igor Gitelman
646.885.5426
igitelman@fbr.com

Energy Policy

Benjamin Salisbury
703.469.1052
bsalisbury@fbr.com

Metals & Mining

David Khani, CFA
703.469.1179
dkhani@fbr.com

Mitesh Thakkar
703.312.9705
mthakkar@fbr.com

March 25, 2011 — Industry Update

Important disclosures can be found at the end of this document

Coal Retirements—25 GW to 50 GW Remain at Risk

Contrary to initial media reports, we believe that EPA's proposed air toxics rule (a.k.a. the Utility MACT) has the potential to lead to a significant number of coal plant retirements. The proposal projects just 10 GW of retirements, but we believe this implies 25 GW of retirements including planned retirements and the forthcoming transport rule. This scenario depends heavily on the widespread adoption of dry sorbent injection (DSI) to control emissions. Our analysis suggests that the potential coal generation retirements from EPA's two rules could be significantly higher if DSI does not prove to be a successful alternative to scrubbing. In a scenario in which DSI is impractical, coal retirements could be north of 50 GW. Thus, we maintain our view that 45 GW in coal retirements is plausible, which would help normalize power markets. Retirements in the 35 GW range are possible if DSI proves more effective than we are assuming. Beneficiaries of the coal fleet transformation are listed below.

- **The EPA's proposed rule is stringent on hazardous air pollutants.** The standards call for reductions of 91% for mercury and acid gases and 55% for sulfur dioxide (SO2). EPA's draft chose to employ few of its flexibility options including subcategorization, health standards, or monitoring during startup, malfunction, or shutdown. To date, the proposed standards for hydrogen chloride (HCl) and mercury (Hg) appear challenging to achieve. Presently, only 12 of the best-performing generation units in each category meet the combination of these two standards. These units are dressed for success and typically sport a full suite of environmental controls (but not DSI). While the EPA has proposed DSI in combination with fabric filters as a means to reduce HCl emissions, our conversations suggest that practical use of this approach may have limits. The proposal would allow for a 30-day rolling average compliance period and unit averaging within a facility.

- **DSI will drive the coal retirement debate.** EPA's headline retirement figure of 10 GW refers to the incremental impact of the MACT rule after accounting for planned retirements and the transport rule. EPA's own gross retirement projection is in fact 25 GW, which reflects widespread adoption of DSI. However, the practical applicability of DSI remains a debatable point due to the disposal of additional ash produced, reliability of the reagent supply chain, the lack of utility sector experience with this technology, and the potential impact on dispatch. More limited adoption of this technology could lift the retirement number above 50 GW. Conversely, widespread adoption of DSI for sub-bituminous coals could reduce our coal retirement expectation from 45 GW to 35 GW. Lower retirement numbers would require even more adoption of DSI for on-the-bubble low-sulfur bituminous coal and from a possible increase in low-sulfur coal blending.

- **Likely beneficiaries of higher retirements include select electric utilities and their suppliers.** For companies under coverage, acceleration in rate base growth is plausible for The Southern Company (SO – Market Perform), Duke Energy Corporation (DUK – Underperform), and Progress Energy (PGN – Market Perform). FirstEnergy Corporation (FE – Market Perform) and PPL Corporation (PPL – Outperform) would likely receive a boost from tightening power markets by 2015. Coal burn affected could reach up to 66 million tons and gas could increase by up to 4.2 Bcf/day.

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The Proposed Rule Is Stringent on Hazardous Air Pollutants

The proposed air toxics rule (a.k.a. the Utility MACT or Maximum Achievable Control Technology rule) may have been initially interpreted by the market as lenient upon its release. This view may have been supported by a number of provisions highlighted by the EPA, such as language encouraging one-year extensions, a carve-out for lignite, unit averaging for emissions, and a 10 GW headline number for coal retirements. However, the feasibility of achieving the HCl standard (a proxy for acid gases) in particular makes this rule a challenge. EPA envisions that this requirement could be met with the widespread use of dry sorbent injection (DSI), a substitute for scrubbers in capturing HCl emissions, and, to a lesser extent, SO2. Practical limitations on the adoption of DSI, including its impact on dispatch, could force more coal retirements than anticipated by the EPA.

By design, the MACT is prospective—the law's goal is to require greater adoption of best-performing technology (see our December 13 note, "Coal Retirements in Perspective—Quantifying the Upcoming EPA Rules," for a legal background). Our examination of what EPA views as the best-performing units in the coal fleet confirms that nearly every coal-fired plant in the country will have to install additional controls in order to comply with the new standards.

- **Very few of the highest-performing plants currently meet the combined requirements for HCl, Hg, and particulate matter (PM).** Utilities must comply with each of the three proposed hazardous air pollutant (HAP) standards (Hg, HCl, and fine particulate matter [PM2.5]) separately. Only 12 of the units used by EPA to represent the top 12% performing units appear to pass both the HCl and Hg standards.
- **Top performing plants are dressed for success, and without DSI.** We analyzed EPA's top-performing units that set the Hg and HCl floors and identified their general profile. Within the Hg group, most bituminous units use an FGD and FF combination, and most sub-bituminous units use an ACI/electrostatic precipitator (ESP) combination. Within the HCl group, most bituminous units (roughly two-thirds of all units that set this floor) use an FGD/FF or FGD/ESP combination. Only five units use solely DSI to control HCl or SO2 emissions.
- **EPA's 10 GW headline coal retirement number from the MACT rule is not the full story. Potential retirements could be higher.** The EPA base case estimates 299 GW of coal generation in 2015, down from 317 GW in 2010, which reflects an 18 GW decline in coal capacity assuming the toxics and transport rules. This decline includes roughly 5 GW of planned retirements and 7 GW of planned coal additions through 2015. Thus, it appears that the EPA is forecasting for 18 GW + 7 GW = 25 GW of coal retirements through 2015, including what is already planned. Please refer to Appendix 2 for a list of EPA's coal retirement projections by unit.

EPA Projects Retirements of Old and Underutilized Plants (As Do We)

	EPA				FBR			
	Specs Exclude New Additions				Specs Exclude New Additions			
Category	Average Age	Average Capacity (MW)	Average Capacity Factor	Retirement Prediction through 2015 (GW)	Average Age	Average Capacity (MW)	Average Capacity Factor	All-in Retirement Prediction (GW)
Retired Units	51	109	56%	25	46	110	54%	45
Operational Units in 2015	44	278	71%	299	42	271	67%	279
Average/Sum	**45**	**265**	**70%**	**324**	**43**	**249**	**65%**	**324**

Source: SNL, EPA, and FBR Research

- **The effective stringency of the proposed rule and subsequent retirements will pivot on EPA's DSI assumptions.** The EPA projects that DSI installations could, in part, be used to remediate HCl and, to a lesser extent, SO2 emissions in lieu of an FGD (thus preempting potential retirements for small coal units). The EPA's forecast reflects 65 GW of DSI installations by 2015, 56 GW of which would be driven by the proposed MACT rule. If DSI proves to be less practical or economic than assumed by the EPA, coal retirements could span a range of 25 GW to 81 GW (25 GW + 56 GW) if no DSI installations take place, which is unlikely. Assuming that half of DSI installations prove practical for what we believe is the addressable market for this technology, then coal

retirement estimates could span 25 GW to 53 GW (25 GW + 56 GW/2) using the EPA's methodology. Practical limitations to the use for DSI include the disposal of ash, reliability of the reagent supply chain, and the lack of utility sector experience with this technology. Also, we note that the high variable cost associated with DSI could push down the utilization rate of many coal plants to the point where one would simply retire them.

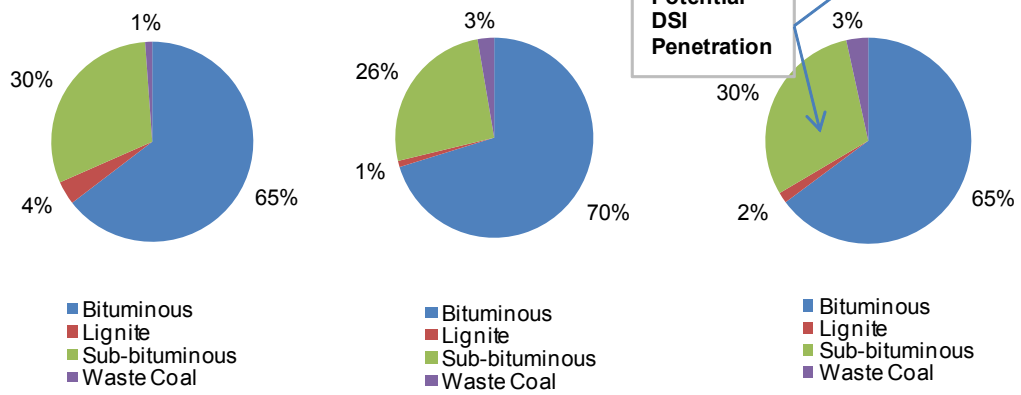
- **Our coal retirement estimate of 45 GW could be 35 GW if we assume widespread adoption of DSI.** We see roughly 10 GW in capacity among our high-risk plants that could support DSI and thus potentially meet some of the proposed standards.

We Expect Coal Retirements of 45 GW versus EPA's 25 GW

EPA Retirements	
Coal Type	**Capacity (MW)**
Bituminous	15,979
Lignite	935
Sub-bituminous	7,526
Waste Coal	285
Total	**24,724**

Original FBR Retirements	
Coal Type	**Capacity (MW)**
Bituminous	31,867
Lignite	462
Sub-bituminous	11,831
Waste Coal	1,222
Total	**45,381**

FBR Retirements, Excluding Planned Retirements and Overlapping EPA Retirements	
Coal Type	**Capacity (MW)**
Bituminous	17,597
Lignite	462
Sub-bituminous	8,155
Waste Coal	932
Grand Total	**27,146**



Source: SNL, EPA, and FBR Research

Roughly 10 GW of Our 45 GW Coal Retirement Assumptions Could Be Impacted by DSI

Coal Region	Total Operating Capacity	Avg. Unit Size (MW)	Avg. Year in Service	Avg. Capacity Factor	SO2 Content (lbs/MMBtu)	Likely Use of DSI
N/A	397	66	1968	69	N/A	N/A
CAPP	8,517	131	1962	27	1.2-2.5	Medium
FC	91	46	1976	N/A	1.0-2.5	Low
GC	307	154	1991	81	1.0-2.5	High
ILL	2,249	86	1962	45	3.0-6.0	Low
LIGNITE	155	52	1958	N/A	1.5-4.0	Low
NAPP	7,810	113	1966	41	2.0-4.5	Low
PRB	10,096	102	1966	44	0.5-1.2	High
UINTA	3,673	122	1965	44	1.0-2.5	High
Total	**33,295**	**110**	**1965**	**39**	**1.0-6.0**	

Note: Reflects FBR's forecast and only unplanned retirements.

Source: SNL, EPA, and FBR Research

What Is the Profile of a Top-Performing Plant?

Below is the profile of the top units that overlap in both EPA's top 12% floors for Hg and HCl used to set the proposed emission standards. This analysis was performed for coals with Btu content of 8,300 per lb and above.

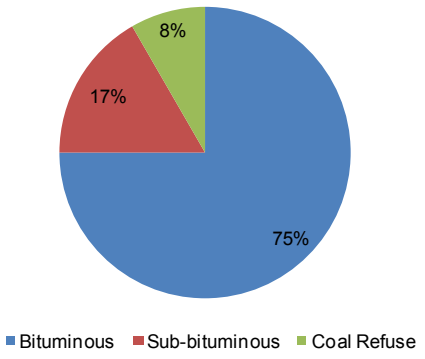
- **Most of these top units employ an FGD and fabric filter. Eleven** out of 12 of the units below use an FGD and fabric filter combination.
- **No units in this group employ DSI to control HCl emissions.** DSI controls were scarce among the top-performing units by category. There were five units with a DSI solely that were in the top 12% of units that determined the HCl floor. No units employing DSI were in the top 12% of units that defined the Hg floor.
- **Few units employ activated carbon injection (ACI) to control mercury emissions.** Only two units burning sub-bituminous coal employ ACI. Most mercury reduction in this group is achieved due to the co-benefits of an FGD/SCR and fabric filter combination.
- About 75% of these top units burn bituminous coal.

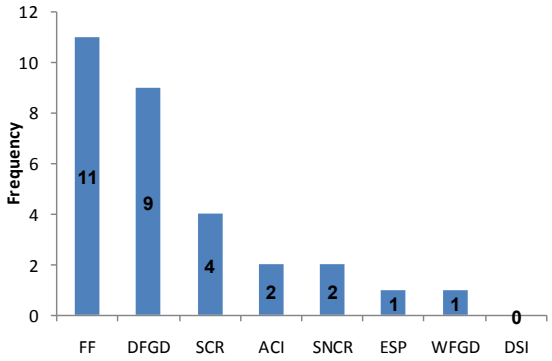
Top-Performing Units That Pass Both of EPA's Proposed Hg and HCl Standards

Plant Name	Unit ID	State	Unit Type	Boiler Type	Boilers	Capacity	Heat Rate	Fuel Type	Control Summary	Hg Emissions in lb/MMBtu	HCl Emissions in lb/MMBtu
Joliet 9	JOL5 CONFIG	IL	Conventional Boiler	Cyclone firing	1	326	10.96	Subbituminous	ACI, ESP	7.53E-10	5.41E-04
TS Power Plant	TSPower	NV	Conventional Boiler	Wall firing - opposed firing	1	242	8.73	Subbituminous	SCR, ACI, DFGD, FF	8.67E-10	2.17E-05
Spruance Genco, LLC	GEN2	VA	Conventional Boiler	Stoker - underfeed	2	57	13.07	Bituminous	DFGD, FF	2.63E-09	1.69E-05
Spruance Genco, LLC	GEN3	VA	Conventional Boiler	Stoker - underfeed	2	57	13.07	Bituminous	DFGD, FF	4.69E-09	1.61E-05
Logan Generating Plant	Unit1	NJ	Conventional Boiler	Wall firing - opposed firing	1	242	8.75	Bituminous	SCR, DFGD, FF	5.33E-09	1.29E-05
Seward	SEW-1	PA	Fluidized bed firing	Fluidized bed firing	2	585	10.60	Coal Refuse (culm or gob)	FBC, SNCR, FF	6.35E-09	1.93E-05
Roanoke Valley I	Boiler 1	NC	Conventional Boiler	Wall firing - front firing	1	182	9.34	Bituminous	DFGD, FF	7.26E-09	7.32E-05
Indiantown Cogeneration, L.P.	1	FL	Conventional Boiler	Wall firing - opposed firing	1	361	9.48	Bituminous	SCR, DFGD, FF	8.54E-09	3.58E-05
Roanoke Valley II	Boiler 2	NC	Conventional Boiler	Wall firing - front firing	1	50	11.20	Bituminous	SNCR, DFGD, FF	1.08E-08	3.22E-05
Spruance Genco, LLC	GEN4	VA	Conventional Boiler	Stoker - underfeed	2	57	13.07	Bituminous	DFGD, FF	1.18E-08	3.84E-05
Chambers Cogeneration LP	Boil 1	NJ	Conventional Boiler	Wall firing - front firing	1	285	4.87	Bituminous	SCR, DFGD, FF	1.93E-08	4.24E-05
Clover	Unit 1	VA	Conventional Boiler	Tangential firing	1	431	11.42	Bituminous	FF, WFGD	2.02E-08	3.38E-04

Source: EPA's HCl and Hg ICR Databases and FBR Research

Top Performing Units: 75% Are Bituminous, 92% Use Fabric Filters, and 75% use Dry FGDs





Source: EPA's HCl and Hg ICR Databases and FBR Research

Overview of the EPA's Utility MACT Standards

What Are the EPA's Proposed Requirements?

The EPA has proposed standards for Hg, HCl, and particulate matter based on a sampling of emissions from the best-performing plants in the U.S. EPA collected a stratified sampling of emissions data, including new stack test data, from utilities in 2010 in order to set the MACT standards, or "floors" for coal- and oil-fired boilers. The floors are the statistically-adjusted average of what EPA considers the best-performing 12% of units for each pollutant or surrogate for which EPA has data. EPA accounted for data variability by applying a 99% upper prediction limit (i.e., level of confidence) calculated with a t-test. Best-performing facilities will comply with the "floor" 99% of the time. EPA incorporated past emissions data when available into the variance calculation.

The PM standard is a proxy for capturing non-Hg heavy metals such as Sb, Be, Cd, Cr, Co, Pg, Mn, and Ni. The standard for HCl is also a proxy for removal of acid gases such as HF, HCN, and Cl2, and it also has implications for SO2 removal. EPA simultaneously issued MACT standards for oil-fired utility boilers and performance standards for new coal-fired boilers (the performance standards are superseded by the more stringent MACT standards).

EPA's Emission Limitations As Outlined by the Toxics Rule

Subcategory	Total Particulate Matter	Hydrogen Chloride	Mercury
Existing coal-fired unit designed for coal > 8,300 Btu/lb	0.03 lb/MMBtu (0.2 lb/MWh)	0.002 lb/MMBtu (0.02 lb/MWh)	1 lb/TBtu (0.02 lb/GWh)
Existing coal-fired unit designed for coal < 8,300 Btu/lb	0.03 lb/MMBtu (0.2 lb/MWh)	0.002 lb/MMBtu (0.02 lb/MWh)	11 lb/TBtu (0.2 lb/GWh) 4 lb/Tbtu (0.04 lb/GWh)
Existing - IGCC	0.05 lb/MMBtu (0.3 lb/MWh)	0.0005 lb/MMBtu (0.003 lb/MWh)	3 lb/TBtu (0.02 lb/GWh)
Existing - Solid oil-derived	0.2 lb/MMBtu (2 lb/MWh)	0.005 lb/MMBtu (0.05 lb/MWh)	0.2 lb/TBtu (0.002 lb/GWh)
New coal-fired unit designed for coal > 8,300 Btu/lb	0.05 lb/MWh	0.3 lb/GWh	0.00001 lb/GWh
New coal-fired unit designed for coal < 8,300 Btu/lb	0.05 lb/MWh	0.3 lb/GWh	0.04 lb/GWh
New - IGCC	0.05 lb/MWh	0.3 lb/GWh	0.00001 lb/GWh
New - Solid oil-derived	0.05 lb/MWh	0.0003 lb/MWh	0.002 lb/GWh

Source: EPA Regulatory Impact Analysis

What Are the Paths to Compliance According to the EPA?

Utilities may change fuels and/or install additional control technology to meet the standard, or they may choose to retire if it is more economic for the power sector to meet electricity demand with other sources of generation.

Acid gas emissions (including SO2) can be reduced with flue gas desulfurization or with dry sorbent injection (DSI):

- **Using wet scrubbers.** These FGDs utilize a variety of reagents including crushed limestone, quick lime, and magnesium-enhanced lime and are capable of removing at least 99% of HF/HCl emissions while also achieving 96% SO2 removal.
- **Using dry scrubbers.** These FGDs utilize a lime-based slurry with a downstream fabric filter to remove at least 93% of SO2 while also capturing over 99% of HCL/HF.
- **Using DSI is another possible alternative.** This technology works by injecting an alkaline powdered material directly into flue gas in order to react with the acid gases. The reacted product is then removed by a PM control device such as a baghouse or an ESP. DSI is most efficient with a baghouse present downstream but can be used with ESP. DSI may utilize a variety of sorbents, including trona, sodium carbonate, or calcium carbonate. DSI can also have mercury co-benefits by reducing the amount of SO3 in the flue gas (SO3 interferes with mercury control).

EPA Expects That DSI Could Be Used to Remove HCl for Lower Sulfur Coals

Performance Assumptions	Limestone Forced Oxidation (LSFO)		Lime Spray Dryer (LSD)		Dry Sorbent Injection (DSI)	
	SO2	HCl	SO2	HCl	SO2	HCl
Percent Removal	96% with a floor of 0.06 lbs/MMBtu	99% with a floor of 0.0001 lbs/MMBtu	92% with a floor of 0.065 lbs/MMBtu	99% with a floor of 0.0001 lbs/MMBtu	**With fabric filter**: 70% --- **With an electrostatic percipitator:** 50%	**With fabric filter:** 90% with a floor of 0.0001 lbs/MMBtu --- **With an ESP:** 60% with a floor of 0.0001 lbs/MMBtu
Capacity Penalty	-1.65%		-0.70%		-0.65%	
Heat Rate Penalty	1.68%		0.71%		0.65%	
Applicability	Units ≥ 25 MW		Units ≥ 25 MW		Units ≥ 25 MW	
Sulfur Content Applicability			Coals ≤ 2.0% Sulfur by Weight		Coals ≤ 2.0 lb/mmBtu of SO2	
Applicable Coal Types	BA, BB, BD, BE, BG, BH, SA, SB, SD, LD, LE, and LG		BA, BB, BD, BE, SA, SB, SD, LD, LE, and LG		BA, BB, BD, SA, SB, SD, and LD	

Note: For applicable coal types-first letter is coal rank: B = Bituminous, S = Sub-bituminous, L = Lignite. Second letter is SO2 content (lbs/MMBtu): A = 0.00-0.80, B = 0.81-1.20, D = 1.21-1.66, E = 1.67-3.34, G=3.35-5.00, H> 5.00.

Source: EPA IPM MACT Update

DSI Capital Costs Are Low but Variable Costs Could Be High

						100 MW		300 MW		500 MW		700 MW		1000 MW	
Control Type	Heat Rate (Btu/kWh)	SO2 Rate (lb/MMBtu)	Capacity Penalty (%)	Heat Rate Penalty (%)	Variable O&M (mills/kWh)	Capital Cost ($/kW)	Fixed O&M ($/kW-yr)	Capital Cost ($/kW)	Fixed O&M ($/kW-yr)	Capital Cost ($/kW)	Fixed O&M ($/kW-yr)	Capital Cost ($/kW)	Fixed O&M ($/kW-yr)	Capital Cost ($/kW)	Fixed O&M ($/kW-yr)
DSI - FF	9,000	2.0	0.64	0.65	6.05	122	2.25	55	0.87	38	0.57	30	0.43	28	0.36
Assuming	10,000	2.0	0.71	0.72	6.72	125	2.28	57	0.89	40	0.58	31	0.43	31	0.38
Bituminous	11,000	2.0	0.79	0.79	7.40	129	2.30	59	0.90	41	0.59	34	0.46	34	0.41
DSI - ESP	9,000	2.0	1.08	1.10	11.23	141	2.41	64	0.94	47	0.64	47	0.57	47	0.52
Assuming	10,000	2.0	1.20	1.22	12.47	145	2.44	66	0.96	52	0.68	52	0.61	52	0.56
Bituminous	11,000	2.0	1.32	1.34	13.72	149	2.48	68	0.98	58	0.73	58	0.65	58	0.60

Source: EPA IPM MACT Update

Mercury capture can be achieved with a full suite of equipment or an ACI:

- **Mercury control depends on speciation.** Upon combustion, mercury exits the furnace in three forms: elemental, oxidized, and as a particulate. Oxidized and particulate mercury are the easiest to control. Elemental mercury is emitted out of the stack; it can be oxidized most effectively with activated carbon that has been brominated. The particulate form is bound to ash and removed by a PM control device such as an ESP or fabric filter (baghouse).
- **Oxidized mercury can be captured by an ACI or FGD system.** A portion of mercury that has converted to oxidized compounds may be removed by either a wet scrubber or by activated carbon injection (ACI) combined with a PM control device.
- **Using a wet FGD system.** A wet FGD can capture oxidized mercury because it is water soluble. Operating a wet FGD/SCR combo with sufficient halogen present will remove more than 90% of the mercury within the flue gas stream.
- **Using an ACI technology.** An ACI provides a unique physical surface to which oxidized mercury can absorb. According to the EPA, ACI has been effective when used with low chlorine coals such as western sub-bituminous. According to the EPA, roughly 90% mercury capture can be achieved with an ACI using a downstream fabric filter. An ESP results in less efficient removal.

EPA Forecast of ACI Fixed and Variable Costs by Unit Size and Heat Rate

					100 MW		300 MW		500 MW		700 MW		1000 MW	
Control Type	Heat Rate (Btu/kWh)	Capacity Penalty (%)	Heat Rate Penalty (%)	Variable O&M (mills/kWh)	Capital Cost ($/kW)	Fixed O&M ($/kW-yr)	Capital Cost ($/kW)	Fixed O&M ($/kW-yr)	Capital Cost ($/kW)	Fixed O&M ($/kW-yr)	Capital Cost ($/kW)	Fixed O&M ($/kW-yr)	Capital Cost ($/kW)	Fixed O&M ($/kW-yr)
ACI System w / Existing ESP	9,000	0.12	0.12	2.76	32.06	0.13	12.60	0.05	8.16	0.03	6.13	0.03	4.53	0.02
ACI w / SIR of 5 lbs/million acfm	10,000	0.13	0.13	3.07	32.56	0.14	12.80	0.05	8.29	0.03	6.23	0.03	4.60	0.02
Assuming Bituminous Coal	11,000	0.14	0.14	3.38	33.04	0.14	12.99	0.05	8.41	0.04	6.32	0.03	4.67	0.02
ACI System w ith an Existing Baghouse	9,000	0.05	0.05	2.24	27.93	0.12	10.98	0.05	7.11	0.03	5.34	0.02	3.95	0.02
ACI w / SIR of 2 lbs/million acfm	10,000	0.05	0.05	2.49	28.37	0.12	11.16	0.05	7.23	0.03	5.43	0.02	4.01	0.02
Assuming Bituminous Coal	11,000	0.06	0.06	2.74	28.80	0.12	11.32	0.05	7.33	0.03	5.51	0.02	4.07	0.02
ACI System w / Additional Baghouse	9,000	0.65	0.65	0.50	240	0.91	182	0.69	162	0.61	150	0.57	139	0.53
ACI + Baghouse w / SIR of 2 lbs/million acfm	10,000	0.65	0.66	0.54	259	0.98	197	0.75	176	0.67	163	0.62	151	0.57
Assuming Bituminous Coal	11,000	0.66	0.66	0.58	278	1.05	212	0.80	189	0.72	176	0.67	163	0.62

Note: SIR = Sorbent Injection Rate.

Source: EPA IPM MACT Update

Non-mercury heavy metals and organics are removed by PM control equipment such as fabric filters (FF) and electrostatic precipitators (ESP). Heavy metals like selenium or arsenic and organics that survive the combustion process are non-volatile and bind to the ash. Both ESPs and fabric filters are capable of removing more than 99% of particulates greater than 2.5 microns in size (PM2.5).

- **Using an ESP.** ESPs are designed for specific fuels; while they require less energy to run than fabric filters, they are less flexible for fuel switching. Increases in gas flow rate, ash resistivity, or particle loading resulting from fuel switching or blending can compromise the performance of ESPs according to EPA documentation.
- **Using a fabric filter.** Fabric filters (a.k.a. baghouses) do not have the same design limitations as an ESP. They also have significant mercury and acid gas co-benefits when used with an FGD, DSI, or ACI. If a unit already has an ESP technology, it can either upgrade its precipitator technology to be more flexible, or alternatively, install a fabric filter.

EPA Estimates of Baghouse (Fabric Filter) Costs by Unit Size and Heat Rate

					100 MW		300 MW		500 MW		700 MW		1000 MW	
Coal Type	Heat Rate (Btu/kWh)	Capacity Penalty (%)	Heat Rate Penalty (%)	Variable O&M (mills/kWh)	Capital Cost ($/kW)	Fixed O&M ($/kW-yr)	Capital Cost ($/kW)	Fixed O&M ($/kW-yr)	Capital Cost ($/kW)	Fixed O&M ($/kW-yr)	Capital Cost ($/kW)	Fixed O&M ($/kW-yr)	Capital Cost ($/kW)	Fixed O&M ($/kW-yr)
	9,000				188	0.8	153	0.6	139	0.6	130	0.6	122	0.5
Bituminous	10,000	0.60	0.60	0.15	205	0.9	167	0.7	151	0.6	141	0.6	132	0.6
	11,000				221	0.9	180	0.8	163	0.7	153	0.6	143	0.6

Source: EPA IPM MACT Update

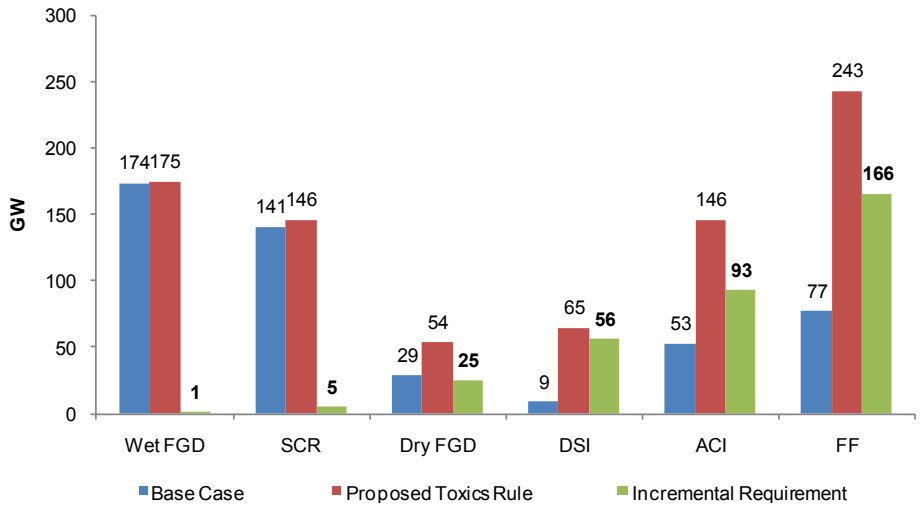
How Does the EPA See Compliance Unfold?

EPA's proposal reflects up to $210 billion in costs through 2030. The EPA estimates that its proposed rules would result in the retrofits shown below, with an annual cost of $10 billion, including approximately $2.9 billion for fuel and $3 billion in additional fixed and variable costs. Roughly $5 billion annually represents amortization of capital through 2030; this amounts to about $200 billion in costs though 2030. EPA projects that this would increase electric rates by approximately 3.7% by 2015.

EPA's proposal reflects 25 GW of retirements, but that is likely the minimum. Under the EPA's scenario, coal capacity declines from 317 GW to 299 GW between 2010 and 2015. The implied retirement number appears to be roughly 25 GW of capacity, including 7 GW of new additions. Retired units have an average age of 51 years, average capacity of 109 MW, and capacity factor of 56%.

EPA sees an industry shift to higher sulfur and chlorine content coals. EPA believes that new control technology retrofits will allow the industry to rely more heavily on local bituminous coal in the eastern and central U.S. that have higher contents of HCl and sulfur, and that is less expensive to transport than western sub-bituminous coal. Under EPA's proposed rule, the demand for bituminous coals increases and the demand for sub-bituminous and lignite coals is reduced slightly. The EPA assumes that the decline in lignite use will reflect a decrease in generation from lignite-fired boilers coupled with a general shift toward sub-bituminous for boilers that were previously burning lignite coal in EPA's base case.

EPA Sees Toxics Rule Driving Sharp Increase in Installation of DSI and Fabric Filters



Source: EPA Regulatory Impact Analysis

DSI May Be Required to Avoid Heavy Coal Retirements

DSI is a key component to meeting the EPA's proposed rules, and its widespread adoption has the potential to limit coal retirements. If DSI were employed widely, we estimate that our coal retirement figure would drop from 45 GW to about 35 GW. EPA appears to be forecasting widespread adoption of DSI, and its forecast includes 65 GW of installation by 2015, 56 GW of which would be driven by the MACT rule. By 2015, the EPA envisions that the coal fleet would be 299 GW, down from 317 GW in 2010. Controls for SO2 and HCl would be achieved using 229 GW of FGDs and 65 GWs in DSIs, in conjunction with 243 GW of fabric filters to collect by-products. However, widespread adoption of DSI is not a foregone conclusion and seems to be a matter of debate.

DSI could be used to meet stringent HCl standards for units that do not require a steep SO2 reduction. DSI has enjoyed limited use in the U.S. so far. However, the technology could become increasingly important when EPA adopts the first federal HCl standard. DSI could be employed to control HCl emissions for smaller coal units in lieu of a scrubber, assuming sulfur content is sufficiently low, and provided resulting SO2 emissions comply with subsequent standards.

However DSI is not always practical for high sulfur coals, which could limit its widespread applicability. According to a Sargent & Lundy's consulting analysis used by EPA, the DSI system *"should not be applied to fuels with a sulfur content of greater than 2 lb SO2/MMBtu."* Based on checks with suppliers, this appears to be the case. DSI captures SO2 in conjunction with HCl. If sulfur concentrations in the emissions are too high, it becomes difficult to capture the resulting by-products. It can also be uneconomical to purchase the needed reagents and dispose of the additional waste product.

Medium/High Sulfur Bituminous Coal Exceeds the 2 lbs/MMBtu Level Appropriate for DSI

Coal Type by Sulfur Grade	Sulfur Emission Factors (lbs/MMBtu)	Mercury Emission Factors (lbs/TBtu)	Applicable Coal Basins by Sulfur Grade
Low Sulfur Eastern Bituminous	0.69	3.78	
Low Sulfur Western Bituminous	1.08	3.34	Colorado
Low Medium Sulfur Bituminous	1.43	12.00	CAPP
Medium Sulfur Bituminous	2.54	13.98	CAPP, ILB
High Sulfur Bituminous	3.98	13.82	NAPP, ILB
High Sulfur Bituminous	6.20	18.67	ILB
Low Sulfur Subbituminous	0.60	4.93	PRB
Low Sulfur Subbituminous	0.94	6.44	PRB
Low Medium Sulfur Subbituminous	1.41	4.43	PRB
Low Medium Sulfur Lignite	1.54	9.76	
Medium Sulfur Lignite	2.63	10.68	
High Sulfur Lignite	3.91	14.88	

Source: EPA's HCl Database and FBR Research

The EPA forecast for DSI installations appears to reflect a large portion of the addressable market. We estimate an addressable market size of 58 GW for DSI installations by taking the EPA's dataset for unscrubbed coal capacity and subtracting expected retirements and high sulfur emitting units. Admittedly, some DSI could be installed for bituminous units in theory. Based on this addressable market size, the EPA assumption of 56 GW in additional DSI installations appears to correspond to a full penetration of the addressable market for this product.

We Estimate That the Addressable DSI Market Is Roughly 58 GW of Capacity

Category	Capacity (GW)
Unscrubbed Capacity	120
-EPA Mandated Retirements	-22
-Units Potentially Incompatible with DSI	-40
Addressable DSI Market	**58**

Source: EPA's Retirement Database, NEEDS database, and FBR Research

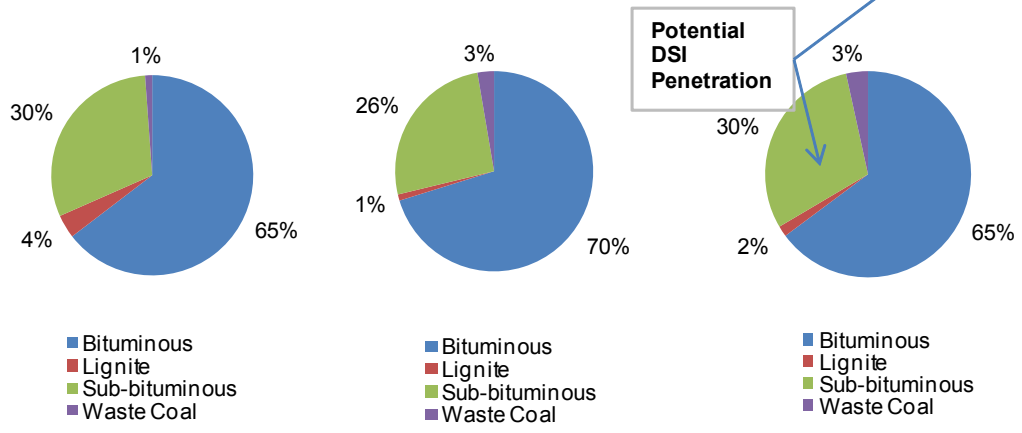
Our coal retirement estimate of 45 GW could be 35 GW if we assume widespread adoption of DSI. We see roughly 10 GW in capacity among our high-risk plants that could support DSI and thus potentially meet some of the proposed standards.

We Expect Coal Retirements of 45 GW versus EPA's 25 GW

EPA Retirements	
Coal Type	**Capacity (MW)**
Bituminous	15,979
Lignite	935
Sub-bituminous	7,526
Waste Coal	285
Total	**24,724**

Original FBR Retirements	
Coal Type	**Capacity (MW)**
Bituminous	31,867
Lignite	462
Sub-bituminous	11,831
Waste Coal	1,222
Total	**45,381**

FBR Retirements, Excluding Planned Retirements and Overlapping EPA Retirements	
Coal Type	**Capacity (MW)**
Bituminous	17,597
Lignite	462
Sub-bituminous	8,155
Waste Coal	932
Grand Total	**27,146**



Source: SNL, EPA, and FBR Research

Roughly 10 GW of our 45 GW Coal Retirement Assumptions Could Be Impacted by DSI

Coal Region	Total Operating Capacity	Avg. Unit Size (MW)	Avg. Year in Service	Avg. Capacity Factor	SO2 Content (lbs/MMBtu)	Likely Use of DSI
N/A	397	66	1968	69	N/A	N/A
CAPP	8,517	131	1962	27	1.2-2.5	Medium
FC	91	46	1976	N/A	1.0-2.5	Low
GC	307	154	1991	81	1.0-2.5	High
ILL	2,249	86	1962	45	3.0-6.0	Low
LIGNITE	155	52	1958	N/A	1.5-4.0	Low
NAPP	7,810	113	1966	41	2.0-4.5	Low
PRB	10,096	102	1966	44	0.5-1.2	High
UINTA	3,673	122	1965	44	1.0-2.5	High
Total	**33,295**	**110**	**1965**	**39**	**1.0-6.0**	

Note: Reflects FBR's forecast and only unplanned retirements.

Source: SNL, EPA, and FBR Research

Currently DSI is not widely used, even among top-performing plants that set the HCl floor. Among EPA's top 12% of units that set the floor for HCl, we find that 15 currently use DSI. Of those 15, we identify five that use DSI without an FGD. Of those five, only one unit uses bituminous coal. We performed the same analysis on the coal units that are still within the HCl limit but outside of the top 12% HCl floor. Of the 46 additional units that pass the HCl emission test, we found that six employ the DSI technology. Of those six, only four use DSI without an FGD, and only one plant uses bituminous coal (and it barely meets the emission standard at .002 lb/MMBtu). In summary, we know of only nine units in the U.S. that use a DSI technology without an FGD and pass the HCl test, and only two of those plants use bituminous coal.

Only Five Units Among the 131 That Define the HCl Floor Employ Solely DSI to Control HCL

Plant Name	Unit ID	State	Unit Type	Boiler Type	Boilers	Capacity	Heat Rate	Fuel Type	Control Summary	HCl Emissions in lb/MMBtu
Cardinal	CD-U1	OH	Conventional Boiler	Wall firing - opposed firing	1	615	8.57	Bituminous	SCR, DSI, ESP, WFGD	1.43E-04
Conesville	CV-4	OH	Conventional Boiler	Tangential firing	1	842	9.46	Bituminous	SCR, ESP, DSI, WFGD	1.63E-04
Ghent	GH1	KY	Conventional Boiler	Tangential firing	1	520	12.09	Bituminous	SCR, DSI, ESP, WFGD	1.80E-04
Cardinal	CD-U2	OH	Conventional Boiler	Wall firing - opposed firing	1	615	8.57	Bituminous	SCR, DSI, ESP, WFGD	1.85E-04
Mountaineer	Mt-1	WV	Conventional Boiler	Wall firing - opposed firing	1	1320	9.06	Bituminous	SCR, DSI, ESP, WFGD	2.14E-04
Arapahoe	Unit 3	CO	Conventional Boiler	Vertical firing	1	48	15.73	Subbituminous	DSI, FF	2.18E-04
Cherokee	Unit 1	CO	Conventional Boiler	Vertical firing	1	117	11.90	Bituminous	DSI, FF	2.25E-04
Gibson	4	IN	Conventional Boiler	Wall firing - opposed firing	1	661	9.48	Bituminous	SCR, DSI, ESP, WFGD	2.61E-04
Montrose	2	MO	Conventional Boiler	Tangential firing	1	188	11.33	Subbituminous	DSI, ESP	3.00E-04
Montrose	1	MO	Conventional Boiler	Tangential firing	1	188	11.38	Subbituminous	DSI, ESP	3.00E-04
Montrose	3	MO	Conventional Boiler	Tangential firing	1	188	11.97	Subbituminous	DSI, ESP	3.00E-04
Cumberland	1	TN	Conventional Boiler	Wall firing - opposed firing	1	1300	10.87	Bituminous	SCR, DSI, ESP, WFGD	3.17E-04
Cumberland	2	TN	Conventional Boiler	Wall firing - opposed firing	1	1300	10.87	Bituminous	SCR, DSI, ESP, WFGD	3.35E-04
Ghent	GH3	KY	Conventional Boiler	Wall firing - opposed firing	1	525	11.18	Bituminous	DSI, ESP, SCR, WFGD	5.27E-04
East Bend Station	2	KY	Conventional Boiler	Wall firing - front firing	1	651	9.70	Bituminous	DSI, ESP, SCR, WFGD	5.28E-04

Source: EPA's HCl and Hg ICR Databases and FBR Research

An Additional Four "DSI-Only" Plants Meet the HCl Floor

Plant Name	Unit ID	State	Unit Type	Boiler Type	Boilers	Capacity	Heat Rate	Fuel Type	Control Summary	HCl Emissions in lb/MMBtu
Ghent	GH4	KY	Conventional Boiler	Wall firing - opposed firing	1	525	11.37	Bituminous	DSI, ESP, SCR, WFGD	6.97E-04
W H Zimmer	1	OH	Conventional Boiler	Wall firing - opposed firing	1	1408	8.99	Bituminous	DSI, SCR, ESP, WFGD	8.78E-04
Dunkirk Generating Plant	1	NY	Conventional Boiler	Tangential firing	1	85	10.85	Subbituminous	SNCR, DSI, FF	9.13E-04
Dunkirk Generating Plant	4	NY	Conventional Boiler	Tangential firing	1	195	9.42	Subbituminous	SNCR, DSI, FF	9.67E-04
Potomac River	4	VA	Conventional Boiler	Tangential firing	1	108	8.90	Bituminous	DSI, ESP	1.13E-03
Potomac River	1	VA	Conventional Boiler	Tangential firing	1	93	10.43	Bituminous	DSI, ESP	1.81E-03

Source: EPA's HCl and Hg ICR Databases and FBR Research

Some Units Use DSI but Don't Comply With the Stated HCl Standard

Plant Name	Unit ID	State	Unit Type	Boiler Type	Boilers	Capacity	Heat Rate	Fuel Type	Control Summary	HCl Emissions in lb/MMBtu
Potomac River	3	VA	Conventional Boiler	Tangential firing	1	108	8.90	Bituminous	DSI	6.15E-03
Arapahoe	Unit 4	CO	Conventional Boiler	Vertical firing	1	118	14.49	Subbituminous	DSI	1.12E-02
General James M. Gavin	GA-2	OH	Conventional Boiler	Wall firing - opposed firing	1	1320	9.04	Bituminous	DSI; WFGD	1.15E-02
General James M. Gavin	GA-1	OH	Conventional Boiler	Wall firing - opposed firing	1	1320	9.04	Bituminous	DSI; WFGD	4.56E-02

Source: EPA's HCl Database and FBR Research

Impact of Retirements on Coal Demand

Given the uncertainty surrounding the widespread adoption of DSI, it is a little premature to further refine our previous estimate of a 52 MT impact on the coal burn. However, if the DSI technology is not applied to coals with sulfur content greater than 2 lbs SO2/MMBtu then high sulfur bituminous coals (NAPP and ILB) will have to be deployed to plants with existing or proposed scrubbing facilities. We note that currently these two regions produce about 236 MTs of coal and represent about 21% of the existing coal supply.

Coal Production and Sulfur Content by Region

Region	2010 Production (MTs)	Sulfur Content (lbs/ MMBTU)
PRB	487	0.5-1.2
NAPP	130	2.0-4.5
CAPP	185	1.2-2.5
ILB	106	3.0-6.0
Western Bit	73	1.0-2.5

Source: SNL and FBR Research

Based on our initial analysis of 45 GW of retirements, we came up with 52 MTs of incremental coal burn being affected. Now if the use of DSI reduces the retirement number to 35 GW, and we assume most of the sub-bituminous (PRB) coal plants will not retire, then the actual impact on coal could be even lower at 43 MTs. Regionally, this should be viewed as a positive for PRB and a negative for NAPP and ILB.

Impact of 45 GW of Retirements on Coal Demand

		Effective Capacity (MW)		Coal (MTs) Impacted	
Regions	No. of Units	2009	3-yr Average	2009	3-yr Average
NAPP	84	3,205	4,915	13	20
CAPP	107	3,759	6,610	16	28
PRB	119	3,897	5,729	23	34
W.Bit	40	1,517	2,323	7	11
ILB	29	855	1,198	4	6
Others	11	431	485	3	4
Total	**390**	**13,664**	**21,261**	**66**	**102**
Net impact after migration to higher utilization plants				52	

Note: The 3-yr average is based on average capacity factors for 2007-2009 period

Source: EIA, SNL, and FBR Research

Mercury Standard Appears to be Readily Achievable

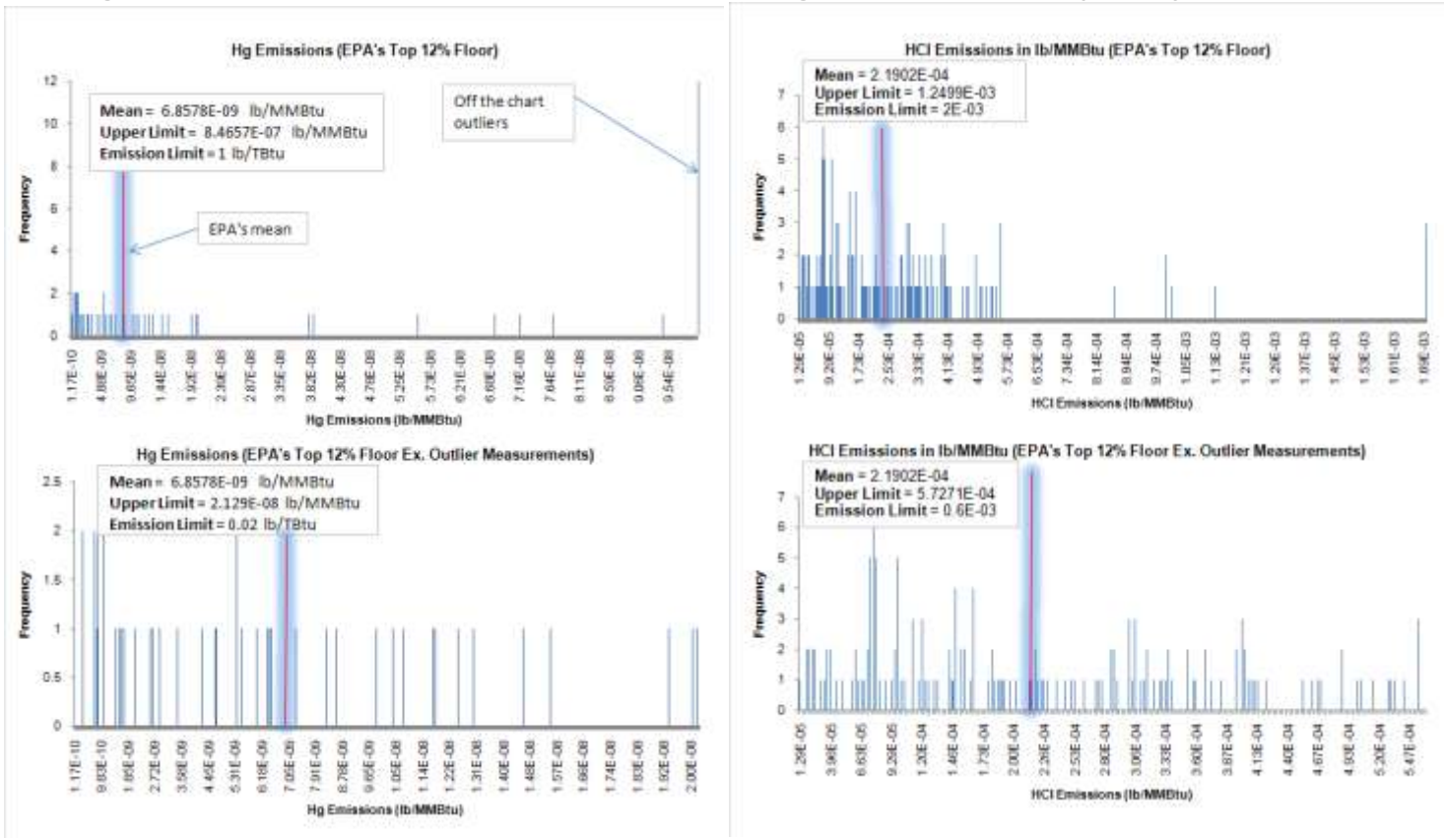
The Hg limit appears relatively easier to meet based on our review of the underlying data used to set the mercury floor. This data, which was collected as part of an EPA Information Collection Request (ICR), shows a high variance. Based on our preliminary analysis that has not been vetted with the EPA at this time, it appears that this variance tends to lower the emission threshold for emitting plants. While 40 units were used to define the Hg floor (top 12%) for coals >8,300 Btu/lb, it turns out that roughly 149 of the 330 units sampled meet the proposed Hg standard. Nonetheless, the current standard still requires remediation equipment.

- **Mercury standard appears readily achievable.** The standard for Hg proposed for coals above 8,300 Btu/lb is 1.0 lb/TBtu. Top 12% units with a heat rate >8,300 Btu/lb tested for Hg emissions had an average emission rate of 6.86*10^(–3) lbs/TBtu (excluding outlier tests), with all measurement tests (including outliers) varying between 1.17*10^(–4) lb/TBtu and 1.61 lb/TBtu, with standard deviation of 0.34 lbs/TBtu.
- **Uncontrolled emissions vary significantly by coal type.** Uncontrolled Hg emissions tend to be around 5 lb/TBtu, varying widely between 1 lb/TBtu and 19 lbs/TBtu depending on the coal. Lignite tends to be in the 13 lb/TBtu to 14 lb/TBtu range. Low medium sulfur bituminous is 5.38 lb/TBtu, high sulfur bituminous is roughly 7 lb/TBtu, and low sulfur western bituminous is 1.82 lb/TBtu.
- **Mercury emissions will still need to be controlled, even with this standard.** Hg emissions can be reduced by operating a wet FGD for SO2 control alongside selective catalytic reduction (SCR) for NOx control, with sufficient halogen present. A cheaper option is to install activated carbon injection (ACI) on units without FGDs. This will remove more than 90% of the mercury using a downstream fabric filter. Our understanding is that an electrostatic precipitator (or ESP) results in less efficient mercury removal with ACI.

The proposed HCl floor appears tougher to meet based on the variance in the ICR data. While 131 units set the HCl floor, roughly 171 of the 1,091 units sampled passed the test. Thus, we believe that the HCl standard could be interpreted as more stringent on this basis than the mercury standard.

- **The proposed HCl emission standard appears relatively tight**. For existing coal units, the proposed emission standard is 2*10^(–03)lb/MMBtu. Top 12% of units tested for HCl emissions average 2.19*10^(–04) lb/MMBtu (excluding outlier tests), with all measurement tests (including outliers) varying between 1.29*10^(–05) and 3.60*10^(–3), with a standard deviation of 4.36*10^(–04). Uncontrolled units appear to emit 3*10^(–02) lb/MMBtu.
- **Typical HCl emissions for the U.S. fleet are not available to our knowledge, but compliance will require capital investment based on the profile of the highest-performing units (previously discussed).** According to the EPA, current wet scrubber technology is capable of removing at least 99% of hydrogen fluoride (HF) and hydrogen chloride (HCl) emissions while also achieving 96% SO2 removal. Dry FGD technology with a downstream fabric filter could remove at least 93% SO2 while also capturing over 99% HCL and HF. As an alternative to an FGD, the EPA proposes the use of a DSI, which injects an alkaline powdered material directly into the flue gas. The reacted product is then removed by a particulate matter control device, such as a baghouse downstream. As discussed in greater detail earlier in this note, debate over the utility MACT's retirement and retrofit impacts centers on the economics of widespread DSI deployment. The relative superiority of FGD for SO2 control suggests that units vulnerable to tightening SO2 standards are more likely to either install FGD or retire, than to install DSI.

Removing Outliers from the 12% Floor Results in 40x and 2x Stricter Hg and HCl Standards, Respectively



Source: EPA's HCl and Hg ICR Databases and FBR Research

Policy Overview: EPA Rulemaking for Coal Generation

EPA finalizing four rules affecting coal power. The Obama EPA has announced its intention to move forward with a number of environmental rulemakings that will pressure coal-fired electric generators to add environmental control technology or shut down. The four pending rules that should receive the most attention are the Clean Air Transport Rule (CATR), the air toxics rule for utilities (MACT—maximum achievable control technology), the proposed rule for coal combustion residuals (CCRs, also known as fly ash) regulation, and the cooling water intake structures rule. This report examines the likely impact of the clean air rules that are expected this year under consent decrees.

Ash and intake rules down the road. According to an analysis from the North American Electric Reliability Corp, the four rules combined could lead to the retirement of up to 78 GW of power generation depending on the requirements. Although strict regulations for coal ash and intake could lead to significant costs, EPA has responded by signaling that it intends to provide flexibility for operators to comply with ash and intake rules, implying low compliance costs. EPA has until March 28 to publish a draft intake rule, and final action is scheduled for July 27, 2010, according to a settlement. Likewise, EPA proposed two options for regulating coal ash in June 2010, but due to the large volume of public comments, it is not expected to finalize the rule until 2012. EPA Administrator Jackson has indicated that the rule would allow for beneficial reuse, a key cost factor.

MACT time lines are also aggressive, but implementation is flexible. Under a consent decree, EPA is required to finalize the rule by November 16, 2011. Under the law, EPA can allow up to three years for compliance or November 16, 2014. The failure to comply with MACT limits could carry civil penalties up to $37,500 per day and an injunction prohibiting operation of the unit. The Clean Air Act allows an additional one-year waiver to install pollution controls on a case-by-case basis. We also note that the consent decree allows EPA to ask the court for more time. Our EPA contacts suggest that they take the deadlines seriously and intend to meet them. However, we note that a large number of public comments or new data could lead EPA to ask for more time.

Transport rule likely to be modified. EPA is scheduled to finalize its transport rule this summer. The transport rule aims to reduce emissions of sulfur dioxide (SO2) and nitrogen oxide (NOx) from power plants located in 31 states and the District of Columbia. The rule is designed to prevent pollution from upwind states contributing to clean air violations in downwind states. Under EPA's proposal, each state would be given an emissions budget (statewide cap) and required to implement policies to ensure that emissions do not exceed authorized levels. Unlike the rule's predecessor, CAIR, trading between states would be significantly limited. This would raise compliance costs and increase pressure on utilities in certain high-emission states. In July 2010, EPA published a draft transport rule, with implementation scheduled to begin on January 1, 2012. Our conversations suggest that EPA is likely to modify the proposed rules to reduce reduction/shutdown pressure on transport states, especially in the Midwest. However, transport rule emission limits are expected to tighten again in 2014 following a planned revision of standards for fine particulate matter and ozone. A subsequent transport rule could focus on sectors beyond the electric generating units.

Public Policy Factors Put Downward Pressure on Retirements

The release of the draft MACT is the starting gun for public negotiations over the stringency and design of Clean Air Act regulations. EPA's analysis reflects a relatively soft impact due largely to the adoption of DSI. We expect some utilities, major consumers of energy, and labor unions to push back on EPA's analysis, arguing that the standards are likely to lead to more widespread plant retirements and higher energy prices. EPA will address these comments as it drafts the final regulations scheduled to be published in November. EPA may adopt further flexibility mechanisms depending on the results of analyses and advocacy efforts. We see a number of factors leading to a more gradual plant closure than one might expect given a plain reading of the Clean Air Act.

Intense political pressure to maintain low-cost power in coal/manufacturing regions. Our analysis suggests that unemployment in the politically sensitive and energy-intensive swing states of the

Midwest dampens the desirability of significant coal retirement and power price appreciation. Much of the unscrubbed capacity is in the coal-producing and consuming regions of the industrial Northeast and upper Midwest, which is also the key electoral swing region in the U.S.

Discretion to allow continued plant operation. The MACT could require less than universal application of environmental controls for implementing, measuring, and monitoring MACT standards. EPA has some discretion in how to measure the emissions to be controlled. Certain designs such as longer measurement periods or measurements of concentrations rather than volumes could allow certain facilities to reach the MACT standard without applying the entire suite of controls needed at other facilities. In designing the MACT regulation, EPA may also "distinguish among classes, types, and sizes of sources within a category or subcategory" when establishing MACT standards. Therefore, EPA could set a different MACT standard based on the size of the facility, the type of fuel, the type of plant, or a number of other factors that could allow certain plants to remain operational for some time after the statutory deadline. Most notably, EPA has resisted the idea of creating subcategories of regulation by coal type, but political pressure to avoid shutdowns could force the agency to reconsider. This is a key issue with the boiler MACT, which we understand may be illustrative of the utility MACT dynamic.

MACT includes years of possible extensions. The Clean Air Act offers additional opportunities to push back the timing of shutdowns. Under the law, the EPA administrator or state-approved program can grant a one-year extension if more time is "necessary for the installation of controls." Likewise, the President can grant an extension for up to two years if technology to implement standards is not available and it is in the interest of national security.

Legal challenges to pending regulations. Litigation appears to be the rule rather than the exception when it comes to Clean Air Act regulation. Our conversations with industry sources suggest a willingness to postpone final decisions on reacting to the Clean Air regulations until after the rules are finalized and have been challenged in court. Although at this time we do not expect that the final rules would be stayed by a court, we note the significant risk that litigation delays pose to the compliance deadlines. We also note the potential for delays if, following litigation, utilities apply control technology on a rushed schedule, creating a shortage of scrubber installation capacity.

Reliability barriers to shutdowns. Our conversations with policy analysts indicate that investors should not anticipate region-wide reliability impacts. A more nuanced perspective on reliability, however, suggests that transmission security can be a highly local issue (for example, a small uncontrolled power plant with no impact on regional reliability but that is essential to maintain voltage on a local transmission line). If retiring such plants would create service concerns for isolated populations or industries, we would expect significant local and Congressional political resistance.

Appendix 1: List of Plants That Define the Top 12% by Category

In the following several pages, we list out EPA's top 12% HCl and Hg floors with least emitting units.

Generation Units Used in Determining EPA's Hg Floor

Plant Name	Unit ID	State	Unit Type	Boiler Type	Boilers	Capacity	Heat Rate	Fuel Type	Control Summary	Hg Emissions in lb/MMBtu
Deepwater	Coal-firing	NJ	Conventional Boiler	Wall firing - front firing	1	87	9.43	Bituminous	DSI, SNCR, FF	1.17E-10
Dallman	32	IL	Conventional Boiler	Cyclone firing	1	84	10.79	Bituminous	SCR, ESP, WFGD	3.71E-10
Dallman	31	IL	Conventional Boiler	Cyclone firing	1	90	10.69	Bituminous	SCR, ESP, WFGD	3.74E-10
Will County	WC4CONFIG	IL	Conventional Boiler	Tangential firing	1	542	9.69	Subbituminous	ACI, ESP	7.50E-10
Joliet 9	JOL5 CONFIG	IL	Conventional Boiler	Cyclone firing	1	326	10.96	Subbituminous	ACI, ESP	7.53E-10
Escalante	1	NM	Conventional Boiler	Tangential firing	1	260	9.10	Subbituminous	FF, WFGD	8.06E-10
TS Power Plant	TSPower	NV	Conventional Boiler	Wall firing - opposed firing	1	242	8.73	Subbituminous	SCR, ACI, DFGD, FF	8.67E-10
Waukegan	WK8CONFIG	IL	Conventional Boiler	Tangential firing	1	383	10.34	Subbituminous	ACI, ESP	8.69E-10
Dallman	33	IL	Conventional Boiler	Tangential firing	1	208	10.05	Bituminous	SCR, ESP, WFGD	1.06E-09
Crawford	CRA7 CONFIG	IL	Conventional Boiler	Tangential firing	1	234	10.16	Subbituminous	ACI, ESP	1.42E-09
Joliet 29	JOL8CONFIG	IL	Conventional Boiler	Tangential firing	2	542	10.03	Subbituminous	ACI, ESP	1.64E-09
St. Nicholas Cogen Project	1	PA	Fluidized bed firing	Fluidized bed firing	1	99	13.10	Coal Refuse (culm or gob)	FBC, FF, WFGD	2.06E-09
Joliet 29	JOL7CONFIG	IL	Conventional Boiler	Tangential firing	2	546	10.19	Subbituminous	ACI, ESP	2.55E-09
Spruance Genco, LLC	GEN2	VA	Conventional Boiler	Stoker - underfeed	2	57	13.07	Bituminous	DFGD, FF	2.63E-09
Will County	WC3CONFIG	IL	Conventional Boiler	Tangential firing	1	278	9.29	Subbituminous	ACI, ESP	2.85E-09
Fisk	FISK19 CONFIG	IL	Conventional Boiler	Tangential firing	1	348	10.30	Subbituminous	ACI, ESP	3.44E-09
Powerton	Pow 5CONFIG	IL	Conventional Boiler	Cyclone firing	2	810	9.98	Subbituminous	ACI, ESP	4.23E-09
Powerton	Pow 6CONFIG	IL	Conventional Boiler	Cyclone firing	2	812	9.92	Subbituminous	ACI, ESP	4.25E-09
Spruance Genco, LLC	GEN3	VA	Conventional Boiler	Stoker - underfeed	2	57	13.07	Bituminous	DFGD, FF	4.69E-09
Nucla	001	CO	Fluidized bed firing	Fluidized bed firing	1	110	9.38	Bituminous	FBC, SNCR, FF	5.33E-09
Logan Generating Plant	Unit1	NJ	Conventional Boiler	Wall firing - opposed firing	1	242	8.75	Bituminous	SCR, DFGD, FF	5.33E-09
Waukegan	WK7CONFIG	IL	Conventional Boiler	Tangential firing	1	345	10.10	Subbituminous	ACI, ESP	5.51E-09
Seward	SEW-1	PA	Fluidized bed firing	Fluidized bed firing	2	585	10.60	Coal Refuse (culm or gob)	FBC, SNCR, FF	6.35E-09
Avon Lake	AL10	OH	Conventional Boiler	Tangential firing	1	101	14.33	Bituminous		6.42E-09
AES Greenidge	Unit 4	NY	Conventional Boiler	Tangential firing	1	112	9.97	Bituminous, Petroleum Coke	SCR, ACI, DFGD, FF	6.46E-09
Roanoke Valley I	Boiler 1	NC	Conventional Boiler	Wall firing - front firing	1	182	9.34	Bituminous	DFGD, FF	7.26E-09
Avon Lake	AL12-2	OH	Conventional Boiler	Wall firing - opposed firing	1	680	9.68	Bituminous	SNCR, ESP	8.27E-09
Indiantown Cogeneration, L.P.	001	FL	Conventional Boiler	Wall firing - opposed firing	1	361	9.48	Bituminous	SCR, DFGD, FF	8.54E-09
Northampton Generating Company, L.P.	GEN1	PA	Fluidized bed firing	Fluidized bed firing	1	121	9.47	Coal Refuse (culm or gob)	FBC, SNCR, FF	1.04E-08
Roanoke Valley II	Boiler 2	NC	Conventional Boiler	Wall firing - front firing	1	50	11.20	Bituminous	SNCR, DFGD, FF	1.08E-08
AES Hawaii	001	HI	Fluidized bed firing	Fluidized bed firing	1	203	5.03	Bituminous	FBC, SNCR, FF	1.17E-08
Spruance Genco, LLC	GEN4	VA	Conventional Boiler	Stoker - underfeed	2	57	13.07	Bituminous	DFGD, FF	1.18E-08
Ebensburg Power Company	EPC01	PA	Fluidized bed firing	Fluidized bed firing	1	58	14.31	Coal Refuse (culm or gob)	FBC, FF, WFGD	1.25E-08
AES Hawaii	002	HI	Fluidized bed firing	Fluidized bed firing	1	203	4.65	Bituminous	FBC, SNCR, FF	1.30E-08
Colver Power Project	AAB01	PA	Fluidized bed firing	Fluidized bed firing	1	131	10.95	Coal Refuse (culm or gob)	FBC, SNCR, FF	1.46E-08
Birchwood Power Facility	1A	VA	Conventional Boiler	Tangential firing	1	222	10.36	Bituminous	SCR, DFGD, FF	1.55E-08
Valley	VAPP-B1	WI	Conventional Boiler	Wall firing - front firing	2	144	12.06	Bituminous	FF, WFGD	1.93E-08
Chambers Cogeneration LP	Boil 1	NJ	Conventional Boiler	Wall firing - front firing	1	285	4.87	Bituminous	SCR, DFGD, FF	1.93E-08
Reid Gardner	1	NV	Conventional Boiler	Wall firing - front firing	1	111	10.95	Bituminous	FF, WFGD	2.01E-08
Clover	Unit 1	VA	Conventional Boiler	Tangential firing	1	431	11.42	Bituminous	FF, WFGD	2.02E-08

Source: EPA's ICR Database

Generation Units Used in Determining EPA's HCl Floor – Top 51 Units Don't Employ DSI

Plant Name	Unit ID	State	Unit Type	Boiler Type	Boilers	Capacity	Heat Rate	Fuel Type	Control Summary	HCl Emissions in lb/MMBtu
Logan Generating Plant	Unit1	NJ	Conventional Boiler	Wall firing - opposed firing	1	242	8.75	Bituminous	SCR, DFGD, FF	1.29E-05
Spruance Genco, LLC	GEN3	VA	Conventional Boiler	Stoker - underfeed	2	57	13.07	Bituminous	DFGD, FF	1.61E-05
Spruance Genco, LLC	GEN2	VA	Conventional Boiler	Stoker - underfeed	2	57	13.07	Bituminous	DFGD, FF	1.69E-05
Seward	SEW-1	PA	Fluidized bed firing	Fluidized bed firing	2	585	10.60	coal refuse (culm or gob)	FBC, SNCR, FF	1.93E-05
Seward	SEW-2	PA	Fluidized bed firing	Fluidized bed firing	2	585	10.60	coal refuse (culm or gob)	FBC, SNCR, FF	1.93E-05
Sandow Station	5A	TX	Fluidized bed firing	Fluidized bed firing	1	282	10.48	Lignite	FBC, SNCR, ACI, DFGD, FF	2.12E-05
TS Power Plant	TSPower	NV	Conventional Boiler	Wall firing - opposed firing	1	242	8.73	Subbituminous	SCR, ACI, DFGD, FF	2.17E-05
Sandow Station	5B	TX	Fluidized bed firing	Fluidized bed firing	1	282	10.48	Lignite	FBC, SNCR, ACI, DFGD, FF	2.55E-05
Holcomb	SGU1	KS	Conventional Boiler	Wall firing - opposed firing	1	387	8.76	Subbituminous	DFGD, FF	2.60E-05
Roanoke Valley II	Boiler 2	NC	Conventional Boiler	Wall firing - front firing	1	50	11.20	Bituminous	SNCR, DFGD, FF	3.22E-05
Indiantown Cogeneration L.P.	001	FL	Conventional Boiler	Wall firing - opposed firing	1	361	9.48	Bituminous	SCR, DFGD, FF	3.58E-05
Rawhide	Rawhide101	CO	Conventional Boiler	Tangential firing	1	305	9.18	Subbituminous	DFGD, FF	3.61E-05
Walter Scott Jr. Energy Center	4	IA	Conventional Boiler	Wall firing - unspecified	1	850	9.03	Subbituminous	SCR, ACI, DFGD, FF	3.80E-05
Spruance Genco, LLC	GEN4	VA	Conventional Boiler	Stoker - underfeed	2	57	13.07	Bituminous	DFGD, FF	3.84E-05
Chambers Cogeneration LP	Boil 1	NJ	Conventional Boiler	Wall firing - front firing	1	285	4.87	Bituminous	SCR, DFGD, FF	4.24E-05
Navajo Generating Station	001	AZ	Conventional Boiler	Tangential firing	1	812	9.17	Bituminous	ESP, WFGD	5.00E-05
Chambers Cogeneration LP	Boil 2	NJ	Conventional Boiler	Wall firing - front firing	1	285	4.87	Bituminous	SCR, DFGD, FF	5.60E-05
Colstrip	Unit3	MT	Conventional Boiler	Tangential firing	1	805	9.41	Subbituminous	ACI, WFGD, Venturi	6.21E-05
Navajo Generating Station	002	AZ	Conventional Boiler	Tangential firing	1	812	9.17	Bituminous	ESP, WFGD	6.67E-05
Cross	C3	SC	Conventional Boiler	Tangential firing	1	625	9.69	Bituminous	SCR, ESP, WFGD	6.89E-05
Hawthorn	5A	MO	Conventional Boiler	Wall firing - opposed firing	1	594	11.11	Subbituminous, Bituminous	SCR, DFGD, FF	7.21E-05
Roanoke Valley I	Boiler 1	NC	Conventional Boiler	Wall firing - front firing	1	182	9.34	Bituminous	DFGD, FF	7.32E-05
H L Spurlock Station	Unit 03	KY	Fluidized bed firing	Fluidized bed firing	1	300	8.33	Bituminous	FBC, SNCR, DFGD, FF	7.33E-05
Hopewell	1 & 2	VA	Conventional Boiler	Stoker - spreader	2	136	6.29	Bituminous	SNCR, MC, DFGD, FF	7.34E-05
J K Spruce	1	TX	Conventional Boiler	Tangential firing	1	580	10.97	Bituminous	FF, WFGD	7.62E-05
Elm Road Generating Station	ERGS-B1	WI	Conventional Boiler	Wall firing - unspecified	1	677	9.62	Bituminous	SCR, FF, WFGD, WESP	7.64E-05
Weston	W4	WI	Conventional Boiler	Wall firing - opposed firing	1	575	9.00	Subbituminous	SCR, ACI, DFGD, FF	7.67E-05
Southampton Power Station	Unit 1 & 2	VA	Conventional Boiler	Stoker - spreader	2	136	6.54	Bituminous	MC, DFGD, FF	7.76E-05
Hammond	Unit 2	GA	Conventional Boiler	Wall firing - front firing	1	115	9.90	Bituminous	ESP, WFGD	7.88E-05
Hammond	Unit 3	GA	Conventional Boiler	Wall firing - front firing	1	115	9.93	Bituminous	ESP, WFGD	7.88E-05
Hammond	Unit 1	GA	Conventional Boiler	Wall firing - front firing	1	115	10.08	Bituminous	ESP, WFGD	7.88E-05
Hammond	Unit 4	GA	Conventional Boiler	Wall firing - front firing	1	520	10.50	Bituminous	SCR, ESP, WFGD	7.88E-05
Cholla	003	AZ	Conventional Boiler	Tangential firing	1	305	9.60	Bituminous	FF, WFGD	8.03E-05
Cholla	004	AZ	Conventional Boiler	Tangential firing	1	425	10.04	Bituminous	FF, WFGD	8.52E-05
Navajo Generating Station	003	AZ	Conventional Boiler	Tangential firing	1	812	9.17	Bituminous	ESP, WFGD	9.38E-05
Pleasant Prairie	PPPPB2	WI	Conventional Boiler	Wall firing - opposed firing	2	1298	9.94	Subbituminous	SCR, ESP, WFGD	9.44E-05
AES Puerto Rico Cogeneration Facility	Unit_2	PR	Fluidized bed firing	Fluidized bed firing	1	255	9.65	Bituminous	FBC, SCR, DFGD, ESP	9.60E-05
San Juan	Unit 3	NM	Conventional Boiler	Wall firing - opposed firing	1	544	10.58	Subbituminous	ACI, FF, WFGD	9.60E-05
Pleasant Prairie	PPPPB1	WI	Conventional Boiler	Wall firing - opposed firing	2	1298	9.94	Subbituminous	SCR, ESP, WFGD	9.66E-05
Dallman	34	IL	Conventional Boiler	Wall firing - opposed firing	1	229	8.39	Bituminous	SCR, FF, WFGD, WESP	9.70E-05
AES Puerto Rico Cogeneration Facility	Unit_1	PR	Fluidized bed firing	Fluidized bed firing	1	255	9.65	Bituminous	FBC, SNCR, DFGD, ESP	1.02E-04
Walter Scott Jr. Energy Center	3	IA	Conventional Boiler	Wall firing - unspecified	1	765	10.07	Subbituminous	DFGD, FF	1.10E-04
Hamilton	Unit 9	OH	Conventional Boiler	Tangential firing	1	51	14.41	Bituminous	ESP, DFGD, FF	1.10E-04
San Juan	Unit 1	NM	Conventional Boiler	Wall firing - front firing	1	370	10.02	Subbituminous	ACI, FF, WFGD	1.11E-04
San Juan	Unit 4	NM	Conventional Boiler	Wall firing - opposed firing	1	544	10.38	Subbituminous	ACI, FF, WFGD	1.18E-04
H L Spurlock Station	Unit 04	KY	Fluidized bed firing	Fluidized bed firing	1	300	9.33	Bituminous	FBC, SNCR, DFGD, FF	1.18E-04
Bowen	Unit 4	GA	Conventional Boiler	Tangential firing	1	933	9.53	Bituminous	SCR, ESP, WFGD	1.19E-04
Oak Grove	OG1	TX	Conventional Boiler	Tangential firing	1	817	10.98	Lignite	SCR, ACI, FF, WFGD	1.20E-04
San Juan	Unit 2	NM	Conventional Boiler	Wall firing - front firing	1	370	9.97	Subbituminous	ACI, FF, WFGD	1.24E-04
Hatfield's Ferry Power Station	001	PA	Conventional Boiler	Wall firing - opposed firing	1	590	9.66	Bituminous	ESP, WFGD	1.31E-04
Hayden	Unit 2	CO	Conventional Boiler	Tangential firing	1	285	9.52	Bituminous	DFGD, FF	1.43E-04

Source: EPA's ICR Database

HCl Floor (Continued)

Plant Name	Unit ID	State	Unit Type	Boiler Type	Boilers	Capacity	Heat Rate	Fuel Type	Control Summary	HCl Emissions in lb/MMBtu
Cardinal	CD-U1	OH	Conventional Boiler	Wall firing - opposed firing	1	615	8.57	Bituminous	SCR, DSI, ESP, WFGD	1.43E-04
Hardin Generator Project	PC1	MT	Conventional Boiler	Wall firing - unspecified	1	119	10.96	Bituminous	SCR, ACI, DFGD, FF	1.46E-04
Neil Simpson II	NS2Cfg	WY	Conventional Boiler	Wall firing - front firing	1	88	12.50	Subbituminous	DFGD, ESP	1.47E-04
Wygen 1	WYG1Cfg	WY	Conventional Boiler	Wall firing - front firing	1	91	11.57	Subbituminous	SCR, DFGD, FF	1.54E-04
Healy	1	AK	Conventional Boiler	Wall firing - front firing	1	25	13.88	Subbituminous	FF	1.54E-04
Bowen	Unit 2	GA	Conventional Boiler	Tangential firing	1	755	10.84	Bituminous	SCR, ESP, WFGD	1.56E-04
Whelan Energy Center Unit 1 (WEC1)	1	NE	Conventional Boiler	Tangential firing	1	84	10.11	Subbituminous	ESP	1.62E-04
AES Petersburg	2ss	IN	Conventional Boiler	Tangential firing	1	445	9.31	Bituminous	SCR, ESP, WFGD	1.62E-04
Yates	Y1BR	GA	Conventional Boiler	Tangential firing	1	107	10.23	Bituminous	ESP, WFGD	1.63E-04
Conesville	CV-4	OH	Conventional Boiler	Tangential firing	1	842	9.46	Bituminous	SCR, ESP, DSI, WFGD	1.63E-04
AES Petersburg	1s	IN	Conventional Boiler	Tangential firing	1	255	8.63	Bituminous	ESP, WFGD	1.76E-04
Ghent	GH1	KY	Conventional Boiler	Tangential firing	1	520	12.09	Bituminous	SCR, DSI, ESP, WFGD	1.80E-04
John E. Amos	AM-2	WV	Conventional Boiler	Wall firing - opposed firing	1	816	8.60	Bituminous	SCR, ESP, WFGD	1.83E-04
Cardinal	CD-U2	OH	Conventional Boiler	Wall firing - opposed firing	1	615	8.57	Bituminous	SCR, DSI, ESP, WFGD	1.85E-04
Cherokee	Unit 2	CO	Conventional Boiler	Vertical firing	1	114	12.21	Bituminous	DFGD, FF	1.86E-04
Louisa	101	IA	Conventional Boiler	Wall firing - unspecified	1	805	10.71	Subbituminous	DFGD, FF	1.91E-04
Welsh	WE-1	TX	Conventional Boiler	Wall firing - opposed firing	1	558	9.24	Subbituminous	ESP	1.94E-04
Valmont	Unit 5	CO	Conventional Boiler	Tangential firing	1	196	9.41	Bituminous	DFGD, FF	2.11E-04
Mountaineer	Mt-1	WV	Conventional Boiler	Wall firing - opposed firing	1	1320	9.06	Bituminous	SCR, DSI, ESP, WFGD	2.14E-04
Arapahoe	Unit 3	CO	Conventional Boiler	Vertical firing	1	48	15.73	Subbituminous	DSI, FF	2.18E-04
Hayden	Unit 1	CO	Conventional Boiler	Wall firing - front firing	1	202	9.72	Bituminous	DFGD, FF	2.18E-04
Wansley	Unit 2	GA	Conventional Boiler	Tangential firing	1	920	9.30	Bituminous	SCR, ESP, WFGD	2.21E-04
R D Green	2	KY	Conventional Boiler	Wall firing - opposed firing	1	239	11.41	Bituminous, Petroleum Coke	ESP, WFGD	2.23E-04
Cherokee	Unit 1	CO	Conventional Boiler	Vertical firing	1	117	11.90	Bituminous	DSI, FF	2.25E-04
Cross	C4	SC	Conventional Boiler	Tangential firing	1	625	10.88	Bituminous	SCR, ESP, WFGD	2.29E-04
Cherokee	Unit 4	CO	Conventional Boiler	Tangential firing	1	383	9.19	Bituminous	DFGD, FF	2.37E-04
Cross	C1	SC	Conventional Boiler	Wall firing - opposed firing	1	610	10.66	Bituminous	SCR, ESP, WFGD	2.44E-04
Bowen	Unit 3	GA	Conventional Boiler	Tangential firing	1	933	7.81	Bituminous	SCR, ESP, WFGD	2.50E-04
HMP&L Station Two Henderson	1	KY	Conventional Boiler	Wall firing - rear firing	1	166	10.83	Bituminous	SCR, ESP, WFGD	2.52E-04
Gibson	4	IN	Conventional Boiler	Wall firing - opposed firing	1	661	9.48	Bituminous	SCR, DSI, ESP, WFGD	2.61E-04
Crystal River Power Plant	CryR_Cfg_5c	FL	Conventional Boiler	Wall firing - opposed firing	1	767	9.68	Bituminous	SCR, ESP, WFGD	2.74E-04
Nebraska City	NC2	NE	Conventional Boiler	Wall firing - front firing	1	682	10.15	Bituminous	SCR, ACI, DFGD, FF	2.76E-04
Marshall	U4	NC	Conventional Boiler	Tangential firing	1	700	8.61	Bituminous	SNCR, ESP, WFGD	2.83E-04
Mt. Storm	Unit 3	WV	Conventional Boiler	Tangential firing	1	560	10.58	Bituminous	SCR, ESP, WFGD	2.85E-04
Marshall	U12007	NC	Conventional Boiler	Tangential firing	1	400	9.15	Bituminous	SNCR, ESP, WFGD	2.86E-04
Marshall	U22007	NC	Conventional Boiler	Tangential firing	1	400	9.16	Bituminous	SNCR, ESP, WFGD	2.86E-04
Conemaugh	CON-1	PA	Conventional Boiler	Tangential firing	1	936	9.60	Bituminous	ESP, WFGD	2.88E-04
Montrose	2	MO	Conventional Boiler	Tangential firing	1	188	11.33	Subbituminous	DSI, ESP	3.00E-04
Montrose	1	MO	Conventional Boiler	Tangential firing	1	188	11.38	Subbituminous	DSI, ESP	3.00E-04
Montrose	3	MO	Conventional Boiler	Tangential firing	1	188	11.97	Subbituminous	DSI, ESP	3.00E-04

Source: EPA's ICR Database

HCl Floor (Continued)

Plant Name	Unit ID	State	Unit Type	Boiler Type	Boilers	Capacity	Heat Rate	Fuel Type	Control Summary	HCl Emissions in lb/MMBtu
PPL Montour	U1	PA	Conventional Boiler	Tangential firing	1	797	9.08	Bituminous	ESP, SCR, WFGD	3.02E-04
HMP&L Station Two Henderson	2	KY	Conventional Boiler	Wall firing - rear firing	1	173	10.78	Bituminous	SCR, ESP, WFGD	3.05E-04
Cherokee	Unit 3	CO	Conventional Boiler	Wall firing - front firing	1	165	11.38	Bituminous	DFGD, FF	3.05E-04
Springerville	3	AZ	Conventional Boiler	Wall firing - opposed firing	1	450	9.33	Subbituminous	SCR, DFGD, FF	3.06E-04
Wansley	Unit 1	GA	Conventional Boiler	Tangential firing	1	920	9.18	Bituminous	SCR, ESP, WFGD	3.11E-04
John E. Amos	AM-3	WV	Conventional Boiler	Wall firing - opposed firing	1	1300	9.18	Bituminous	SCR, ESP, WFGD	3.13E-04
Cogentrix Virginia Leasing Corporation	GEN2	VA	Conventional Boiler	Stoker - underfeed	3	58	10.43	Bituminous	DFGD, FF	3.15E-04
Cumberland	1	TN	Conventional Boiler	Wall firing - opposed firing	1	1300	10.87	Bituminous	SCR, DSI, ESP, WFGD	3.17E-04
Marshall	U3	NC	Conventional Boiler	Tangential firing	1	700	8.72	Bituminous	SCR, ESP, WFGD	3.26E-04
Conemaugh	CON-2	PA	Conventional Boiler	Tangential firing	1	936	9.60	Bituminous	ESP, WFGD	3.33E-04
Cumberland	2	TN	Conventional Boiler	Wall firing - opposed firing	1	1300	10.87	Bituminous	SCR, DSI, ESP, WFGD	3.35E-04
Clover	Unit 2	VA	Conventional Boiler	Tangential firing	1	434	11.62	Bituminous	SNCR, FF, WFGD	3.38E-04
PPL Montour	U2	PA	Conventional Boiler	Tangential firing	1	792	9.14	Bituminous	ESP, SCR, WFGD	3.57E-04
AES Cayuga, LLC	Unit_1	NY	Conventional Boiler	Tangential firing	1	164	8.91	Bituminous	SCR, ESP, WFGD	3.59E-04
Red Hills Generating Facility	002	MS	Fluidized bed firing	Fluidized bed firing	1	250	9.53	Lignite	FBC, FF	3.67E-04
Red Hills Generating Facility	001	MS	Fluidized bed firing	Fluidized bed firing	1	250	9.60	Lignite	FBC, FF	3.67E-04
Clover	Unit 1	VA	Conventional Boiler	Tangential firing	1	431	11.42	Bituminous	FF, WFGD	3.73E-04
Quindaro	Unit 1	KS	Conventional Boiler	Cyclone firing	1	77	10.16	Subbituminous	ESP	3.80E-04
Wygen 2	WYG2Cfg	WY	Conventional Boiler	Wall firing - front firing	1	96	13.54	Subbituminous	SCR, DFGD, FF	3.92E-04
PSEG Hudson Generating Station	HUDU2E2PT2OS 1-Coal	NJ	Conventional Boiler	Wall firing - opposed firing	1	660	10.00	Subbituminous	SNCR, ESP	3.94E-04
PPL Brunner Island	U2	PA	Conventional Boiler	Tangential firing	1	393	9.64	Bituminous	ESP, WFGD	3.98E-04
PPL Brunner Island	U1	PA	Conventional Boiler	Tangential firing	1	330	10.14	Bituminous	FF, WFGD	3.98E-04
BL England	2 Coal w or w/o TDF	NJ	Conventional Boiler	Cyclone firing	1	167	9.56	Bituminous	SNCR, ACI, ESP, WFGD	4.05E-04
Homer City Station	HC3CONFIG	PA	Conventional Boiler	Wall firing - opposed firing	1	680	9.08	Bituminous	SCR, ESP, WFGD	4.06E-04
Nearman Creek	N1	KS	Conventional Boiler	Wall firing - front firing	1	257	9.45	Subbituminous	ESP	4.10E-04
Laramie River Station	3	WY	Conventional Boiler	Wall firing - opposed firing	1	610	10.82	Subbituminous	DFGD, ESP	4.11E-04
Mt. Storm	Unit 1&2	WV	Conventional Boiler	Tangential firing	2	1109	11.91	Bituminous	SCR, ESP, WFGD	4.20E-04
Reid Gardner	3	NV	Conventional Boiler	Wall firing - front firing	1	111	11.14	Bituminous	FF, WFGD	4.52E-04
AES Cayuga, LLC	Unit_2	NY	Conventional Boiler	Tangential firing	1	168	8.63	Bituminous	ESP, WFGD	4.66E-04
Mecklenburg Power Station	Unit 1 & 2	VA	Conventional Boiler	Wall firing - front firing	2	152	12.07	Bituminous	DFGD, FF	4.86E-04
Newton	002	IL	Conventional Boiler	Tangential firing	1	620	8.87	Subbituminous	ACI, ESP	4.87E-04
Prairie Creek	Unit 2	IA	Conventional Boiler	Stoker - overfeed	4	221	12.33	Subbituminous	ESP	5.00E-04
Duck Creek	001	IL	Conventional Boiler	Wall firing - unspecified	1	400	11.25	Subbituminous	SCR, ESP, WFGD	5.01E-04
Boswell Energy Center	BEC3	MN	Conventional Boiler	Tangential firing	1	371	11.08	Subbituminous	SCR, ESP, ACI, FF	5.13E-04
Ghent	GH3	KY	Conventional Boiler	Wall firing - opposed firing	1	525	11.18	Bituminous	DSI, ESP, SCR, WFGD	5.27E-04
East Bend Station	2	KY	Conventional Boiler	Wall firing - front firing	1	651	9.70	Bituminous	DSI, ESP, SCR, WFGD	5.28E-04
Joliet 9	JOL5 CONFIG	IL	Conventional Boiler	Cyclone firing	1	326	10.96	Subbituminous	ACI, ESP	5.41E-04
Elrama Power Plant	ELR4-2	PA	Conventional Boiler	Wall firing - front firing	1	185	10.38	Bituminous	SNCR, MC, ESP, WFGD	5.53E-04
Elrama Power Plant	ELR3-2	PA	Conventional Boiler	Vertical firing	1	125	10.42	Bituminous	SNCR, MC, ESP, WFGD	5.53E-04
Elrama Power Plant	ELR1-2	PA	Conventional Boiler	Vertical firing	1	100	12.54	Bituminous	SNCR, MC, ESP, WFGD	5.53E-04

Source: EPA's ICR Database

Appendix 2: List of EPA's Projected Coal Retirements by Unit

Projected EPA Coal Retirements by Unit

Plant Name	Unit	State	Capacity (MW)	Coal Type	Retirement Category
Arapahoe	3	Colorado	47	Subbituminous	Planned
Arapahoe	4	Colorado	121	Subbituminous	Planned
Avon Lake	10	Ohio	93	Bituminous	Incremental
Blount Street	5	Wisconsin	22	Bituminous	Planned
Blount Street	8	Wisconsin	49	Bituminous	Incremental
Blount Street	9	Wisconsin	48	Bituminous	Incremental
Blue Valley	3	Missouri	51	Bituminous	Incremental
BP Wilmington Calciner	GEN1	California	29	Waste coal	Incremental
Brayton Point	3	Massachusetts	612	Bituminous	Incremental
Bremo Bluff	3	Virginia	71	Bituminous	Incremental
Bremo Bluff	4	Virginia	156	Bituminous	Incremental
Buck	5	North Carolina	38	Bituminous	Incremental
Buck	6	North Carolina	38	Bituminous	Incremental
Buck	7	North Carolina	38	Bituminous	Incremental
Canadys Steam	CAN1	South Carolina	105	Bituminous	Incremental
Cape Fear	5	North Carolina	144	Bituminous	Incremental
Cape Fear	6	North Carolina	172	Bituminous	Incremental
Carbon	1	Utah	67	Bituminous	Incremental
Chamois	2	Missouri	49	Bituminous	Incremental
Cherokee	2	Colorado	120	Bituminous	Planned
Cherokee	1	Colorado	115	Bituminous	Planned
Chesapeake	2	Virginia	111	Bituminous	Incremental
Cliffside	1	North Carolina	39	Bituminous	Planned
Cliffside	2	North Carolina	39	Bituminous	Planned
Cliffside	3	North Carolina	62	Bituminous	Planned
Cliffside	4	North Carolina	62	Bituminous	Planned
Colbert	1	Alabama	176	Bituminous	Incremental
Colbert	2	Alabama	176	Bituminous	Incremental
Colbert	3	Alabama	176	Bituminous	Incremental
Colbert	4	Alabama	172	Bituminous	Incremental
Colstrip Energy LP	BLR1	Montana	35	Waste coal	Incremental
Cromby Generating Station	1	Pennsylvania	135	Bituminous	Planned
D B Wilson	W1	Kentucky	420	Bituminous	Incremental
Dale	1	Kentucky	27	Bituminous	Incremental
Dale	2	Kentucky	27	Bituminous	Incremental
Dale	3	Kentucky	75	Bituminous	Incremental
Dale	4	Kentucky	75	Bituminous	Incremental
Dallman	31	Illinois	86	Bituminous	Incremental
Dallman	32	Illinois	87	Bituminous	Incremental

Source: EPA's IPM Retirement Database and FBR Research

EPA Retirements (Continued)

Plant Name	Unit	State	Capacity (MW)	Coal Type	Retirement Category
Dan River	1	North Carolina	67	Bituminous	Planned
Dan River	2	North Carolina	67	Bituminous	Planned
Dan River	3	North Carolina	142	Bituminous	Planned
Deepw ater	8	New Jersey	80	Bituminous	Incremental
Dubuque	1	Iow a	35	Subbituminous	Incremental
Dubuque	5	Iow a	30	Subbituminous	Incremental
Eagle Valley	3	Indiana	43	Bituminous	Incremental
Eagle Valley	4	Indiana	56	Bituminous	Incremental
Earl F Wisdom	1	Iow a	38	Bituminous	Incremental
Eastlake	3	Ohio	132	Subbituminous	Incremental
Eckert Station	1	Michigan	40	Subbituminous	Incremental
Eckert Station	2	Michigan	42	Subbituminous	Incremental
Eckert Station	3	Michigan	41	Subbituminous	Incremental
Eckert Station	4	Michigan	69	Subbituminous	Incremental
Eckert Station	5	Michigan	69	Subbituminous	Incremental
Eckert Station	6	Michigan	67	Subbituminous	Incremental
Eddystone Generating Station	2	Pennsylvania	309	Bituminous	Planned
Eddystone Generating Station	1	Pennsylvania	648	Bituminous	Planned
Edw ardsport	7-1	Indiana	45	Bituminous	Planned
Edw ardsport	8-1	Indiana	75	Bituminous	Planned
Endicott Station	1	Michigan	55	Bituminous	Incremental
ERCT_TX_Coal steam	1	Texas	300	Subbituminous	Incremental
G F Weaton Pow er Station	BLR1	Pennsylvania	56	Subbituminous	Incremental
G F Weaton Pow er Station	BLR2	Pennsylvania	56	Subbituminous	Incremental
Glen Lyn	51	Virginia	45	Bituminous	Incremental
Glen Lyn	52	Virginia	45	Bituminous	Incremental
How ard Dow n	10	New Jersey	23	Bituminous	Incremental
Hutsonville	05	Illinois	76	Subbituminous	Incremental
Hutsonville	06	Illinois	77	Subbituminous	Incremental
Indian River Generating Station	3	Delaw are	153	Bituminous	Planned
Indian River Generating Station	1	Delaw are	90	Bituminous	Planned
Indian River Generating Station	2	Delaw are	165	Bituminous	Planned
Jack McDonough	MB1	Georgia	258	Bituminous	Planned
Jack McDonough	MB2	Georgia	259	Bituminous	Planned
James De Young	5	Michigan	27	Bituminous	Incremental
James River Pow er Station	3	Missouri	41	Subbituminous	Incremental
James River Pow er Station	4	Missouri	56	Subbituminous	Incremental
John Sevier	1	Tennessee	176	Bituminous	Planned
John Sevier	2	Tennessee	176	Bituminous	Planned
John Sevier	3	Tennessee	176	Bituminous	Incremental
John Sevier	4	Tennessee	176	Bituminous	Incremental

Source: EPA's IPM Retirement Database and FBR Research

EPA Retirements (Continued)

Plant Name	Unit	State	Capacity (MW)	Coal Type	Retirement Category
Johnsonville	1	Tennessee	106	Subbituminous	Incremental
Johnsonville	10	Tennessee	141	Subbituminous	Incremental
Johnsonville	2	Tennessee	106	Subbituminous	Incremental
Johnsonville	3	Tennessee	106	Subbituminous	Incremental
Johnsonville	4	Tennessee	106	Subbituminous	Incremental
Johnsonville	5	Tennessee	106	Subbituminous	Incremental
Johnsonville	6	Tennessee	106	Subbituminous	Incremental
Johnsonville	7	Tennessee	141	Subbituminous	Incremental
Johnsonville	8	Tennessee	141	Subbituminous	Incremental
Johnsonville	9	Tennessee	141	Subbituminous	Incremental
Kraft	1	Georgia	48	Bituminous	Incremental
KUCC	1	Utah	30	Bituminous	Incremental
KUCC	2	Utah	30	Bituminous	Incremental
KUCC	3	Utah	30	Bituminous	Incremental
L V Sutton	1	North Carolina	93	Bituminous	Planned
L V Sutton	2	North Carolina	102	Bituminous	Planned
L V Sutton	3	North Carolina	403	Bituminous	Planned
Lansing	2	Iow a	11	Subbituminous	Planned
Lansing	3	Iow a	37	Subbituminous	Planned
Lansing	1	Iow a	292	Subbituminous	Planned
Law rence Energy Center	3	Kansas	48	Subbituminous	Incremental
Lee	1	North Carolina	74	Bituminous	Planned
Lee	2	North Carolina	77	Bituminous	Planned
Lee	3	North Carolina	248	Bituminous	Planned
Marion	4	Illinois	170	Waste coal	Incremental
Marshall	4	Missouri	5	Bituminous	Incremental
Marshall	5	Missouri	16	Bituminous	Incremental
Marysville	9	Michigan	42	Bituminous	Planned
Marysville	10	Michigan	42	Bituminous	Planned
Marysville	11	Michigan	42	Bituminous	Planned
Marysville	12	Michigan	42	Bituminous	Planned
Meredosia	01	Illinois	72	Subbituminous	Planned
Meredosia	02	Illinois	72	Subbituminous	Planned
Meredosia	03	Illinois	72	Subbituminous	Planned
Meredosia	05	Illinois	203	Subbituminous	Incremental
Milton L Kapp	1	Iow a	9	Subbituminous	Planned
Missouri City	1	Missouri	19	Bituminous	Incremental
Missouri City	2	Missouri	19	Bituminous	Incremental
Mohave	1	Nevada	790	Subbituminous	Planned
Mohave	2	Nevada	790	Subbituminous	Planned

Source: EPA's IPM Retirement Database and FBR Research

EPA Retirements (Continued)

Plant Name	Unit	State	Capacity (MW)	Coal Type	Retirement Category
Mt Poso Cogeneration	BL01	California	52	Bituminous	Planned
Muscatine Plant #1	8	Iowa	35	Subbituminous	Incremental
Muskingum River	1	Ohio	190	Bituminous	Incremental
Muskingum River	2	Ohio	190	Bituminous	Incremental
Navajo	1	Arizona	750	Bituminous	Incremental
Navajo	2	Arizona	750	Bituminous	Incremental
Navajo	3	Arizona	750	Bituminous	Incremental
New Castle	3	Pennsylvania	95	Bituminous	Incremental
New Castle	5	Pennsylvania	138	Bituminous	Incremental
Niles	2	Ohio	111	Bituminous	Incremental
Northside Generating Station	1	Florida	275	Subbituminous	Incremental
Northside Generating Station	2	Florida	275	Subbituminous	Incremental
Philip Sporn	51	West Virginia	450	Bituminous	Planned
Picway	9	Ohio	95	Bituminous	Incremental
Potomac River	1	Virginia	88	Bituminous	Incremental
Potomac River	2	Virginia	88	Bituminous	Incremental
Prairie Creek	2	Iowa	10	Subbituminous	Planned
Quindaro	1	Kansas	72	Subbituminous	Incremental
Quindaro	2	Kansas	110	Subbituminous	Incremental
R E Burger	5	Ohio	47	Bituminous	Incremental
R E Burger	6	Ohio	47	Bituminous	Incremental
R Gallagher	1	Indiana	140	Bituminous	Incremental
R Gallagher	3	Indiana	140	Bituminous	Incremental
Richard Gorsuch	1	Ohio	50	Bituminous	Planned
Richard Gorsuch	2	Ohio	50	Bituminous	Planned
Richard Gorsuch	3	Ohio	50	Bituminous	Planned
Richard Gorsuch	4	Ohio	50	Bituminous	Planned
Riverbend	7	North Carolina	94	Bituminous	Incremental
Riverbend	8	North Carolina	94	Bituminous	Incremental
Riverton	39	Kansas	38	Subbituminous	Incremental
Riverton	40	Kansas	54	Subbituminous	Incremental
Rivesville	7	West Virginia	46	Bituminous	Incremental
Rivesville	8	West Virginia	91	Bituminous	Incremental
Robert A Reid	R1	Kentucky	65	Bituminous	Incremental
Rodemacher	3A	Louisiana	330	Subbituminous	Incremental
Rumford Cogeneration	6	Maine	42	Bituminous	Incremental
Rumford Cogeneration	7	Maine	42	Bituminous	Incremental
S A Carlson	10	New York	15	Bituminous	Incremental
S A Carlson	12	New York	15	Bituminous	Incremental
S A Carlson	9	New York	15	Bituminous	Incremental
Salem Harbor	1	Massachusetts	82	Bituminous	Incremental
Salem Harbor	2	Massachusetts	80	Bituminous	Incremental
Salem Harbor	3	Massachusetts	149	Bituminous	Incremental

Source: EPA's IPM Retirement Database and FBR Research

EPA Retirements (Continued)

Plant Name	Unit	State	Capacity (MW)	Coal Type	Retirement Category
San Miguel	SM-1	Texas	391	Lignite	Incremental
Sandow	4	Texas	544	Lignite	Incremental
Schiller	4	New Hampshire	48	Bituminous	Incremental
Scholz	1	Florida	49	Bituminous	Incremental
Scholz	2	Florida	49	Bituminous	Incremental
Shawville	1	Pennsylvania	122	Bituminous	Incremental
Sibley	1	Missouri	54	Subbituminous	Incremental
Sibley	2	Missouri	54	Subbituminous	Incremental
Sixth Street	5	Iowa	14	Subbituminous	Planned
Sixth Street	2	Iowa	14	Subbituminous	Planned
Sixth Street	3	Iowa	14	Subbituminous	Planned
Sixth Street	4	Iowa	14	Subbituminous	Planned
South Oak Creek	5	Wisconsin	261	Subbituminous	Incremental
South Oak Creek	6	Wisconsin	264	Subbituminous	Incremental
Sunbury Generation LP	3	Pennsylvania	94	Bituminous	Incremental
Sunbury Generation LP	4	Pennsylvania	128	Bituminous	Incremental
Sunnyside Cogen Associates	1	Utah	51	Waste Coal	Incremental
Sutherland	2	Iowa	31	Subbituminous	Planned
Tanners Creek	U1	Indiana	145	Bituminous	Incremental
Tecumseh Energy Center	10	Kansas	129	Subbituminous	Incremental
Tecumseh Energy Center	9	Kansas	74	Subbituminous	Incremental
Trenton Channel	16	Michigan	53	Subbituminous	Incremental
Trenton Channel	17	Michigan	53	Subbituminous	Incremental
Trenton Channel	18	Michigan	53	Subbituminous	Incremental
Tyrone	5	Kentucky	71	Bituminous	Incremental
Valley	1	Wisconsin	70	Bituminous	Incremental
Valley	2	Wisconsin	70	Bituminous	Incremental
Valley	3	Wisconsin	70	Bituminous	Incremental
Valley	4	Wisconsin	70	Bituminous	Incremental
W H Weatherspoon	1	North Carolina	48	Bituminous	Incremental
W H Weatherspoon	2	North Carolina	49	Bituminous	Incremental
W H Weatherspoon	3	North Carolina	76	Bituminous	Incremental
Wabash River	2	Indiana	85	Bituminous	Planned
Wabash River	3	Indiana	85	Bituminous	Planned
Wabash River	5	Indiana	95	Bituminous	Planned
Widows Creek	1	Alabama	111	Bituminous	Planned
Widows Creek	2	Alabama	111	Bituminous	Planned
Widows Creek	3	Alabama	111	Bituminous	Planned
Widows Creek	4	Alabama	111	Bituminous	Planned
Widows Creek	5	Alabama	111	Bituminous	Planned
Widows Creek	6	Alabama	111	Bituminous	Planned
Will County	1	Illinois	151	Subbituminous	Planned
Will County	2	Illinois	148	Subbituminous	Planned
Willow Island	1	West Virginia	54	Bituminous	Incremental
Grand Total			**24,724**		

Source: EPA's IPM Retirement Database and FBR Research

Industry Risks

Level of interest rates affects valuation. There is a strong correlation between the trading multiples of regulated electric utilities and long-term interest rates. If long-term rates were to increase sharply, we would expect the trading multiples to contract.

Capital plan execution risk. Regulated utilities may not complete their capital budgets or obtain timely recovery for them. This could have an adverse effect on earnings growth, cash flows, and valuation.

Sufficient regulatory recovery is not guaranteed. Most of the regulated utilities operate on a rate-of-return/cost-of-service basis. If adequate recovery on invested capital is not achieved in a timely fashion, earnings and cash flows could be pressured. This could lead to dilutive equity issuances.

Economic downturns reduce demand for electricity. Poor economic conditions typically result in weaker electricity sales and cash flows and affect the rate of delinquent customer accounts receivable. When industrial customers reduce production, there is a particularly large negative impact on electricity consumption.

Potentially high environmental compliance costs associated with coal or carbon. Many utilities rely heavily on coal for electricity production and could face higher environmental compliance costs for carbon emissions or coal. While these costs will likely be passed through to customers for regulated utilities, we are not certain how much would be recovered. Such costs could force electricity rates up, resulting in regulatory "pushback." Merchant utilities relying heavily on coal or natural gas could incur higher compliance costs, and not all of these costs would necessarily be recovered through market pricing dynamics.

Natural gas prices, which are volatile, can have an impact on the valuation of integrated names. Changes in the price of natural gas can affect the valuation of integrated electric utilities, both to the upside and to the downside. Such volatility appears inherent to the sector.

Increases in cost of fuel can squeeze merchant margins. Coal, uranium, and natural gas are some of the fuel resources that competitive businesses rely on. Increases in the cost of these commodities, without offsetting power price increases, can adversely affect profit margins.

*Closing price of last trading day immediately prior to the date of this publication unless otherwise indicated

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Selling Uncovered Puts--Significant risk that investors will experience losses much greater than premium income received.

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HOLD [Market Perform]	45.3%	5.7%
SELL [Underperform]	6.0%	3.6%

(1) As of midnight on the business day immediately prior to the date of this publication.

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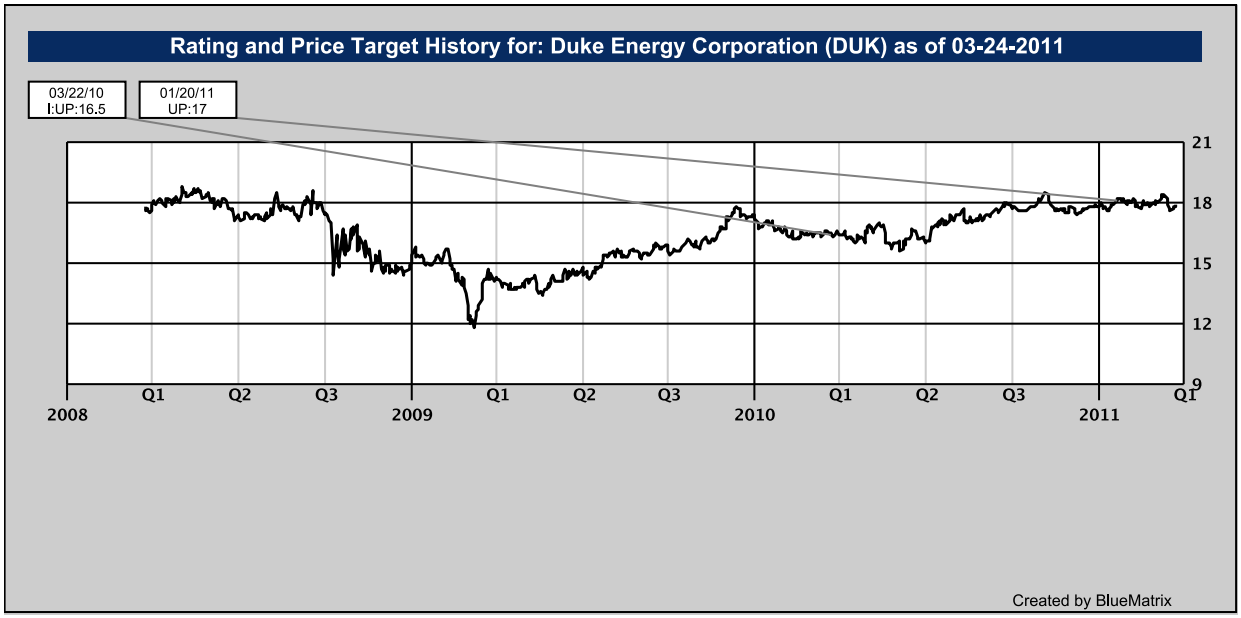

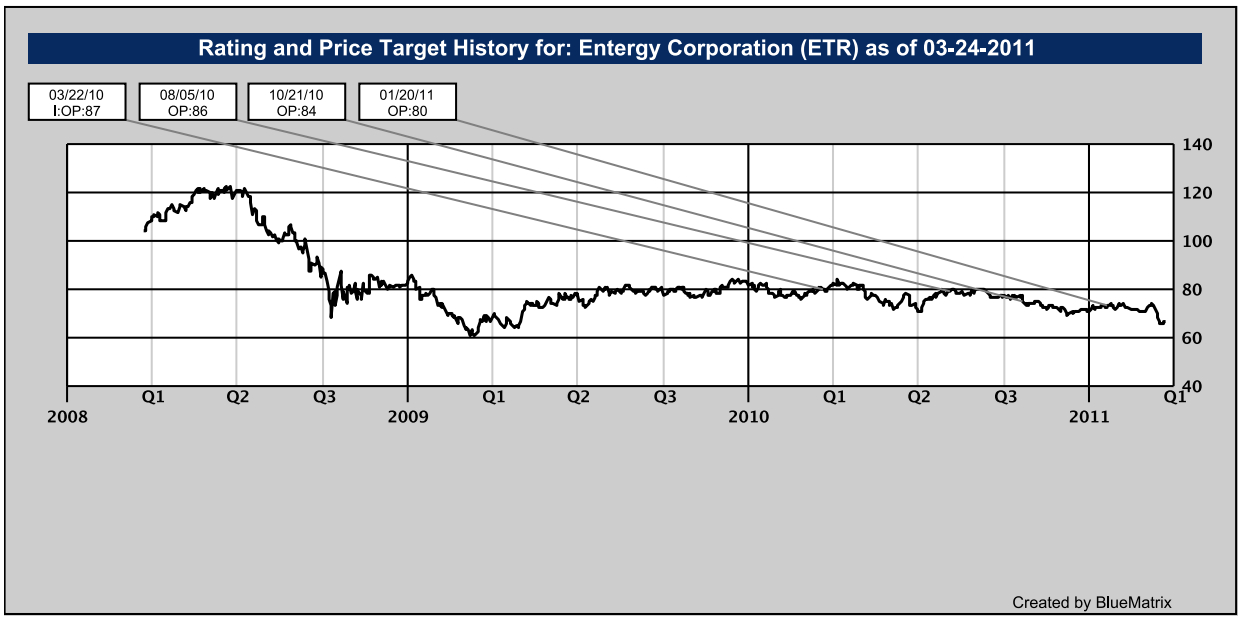

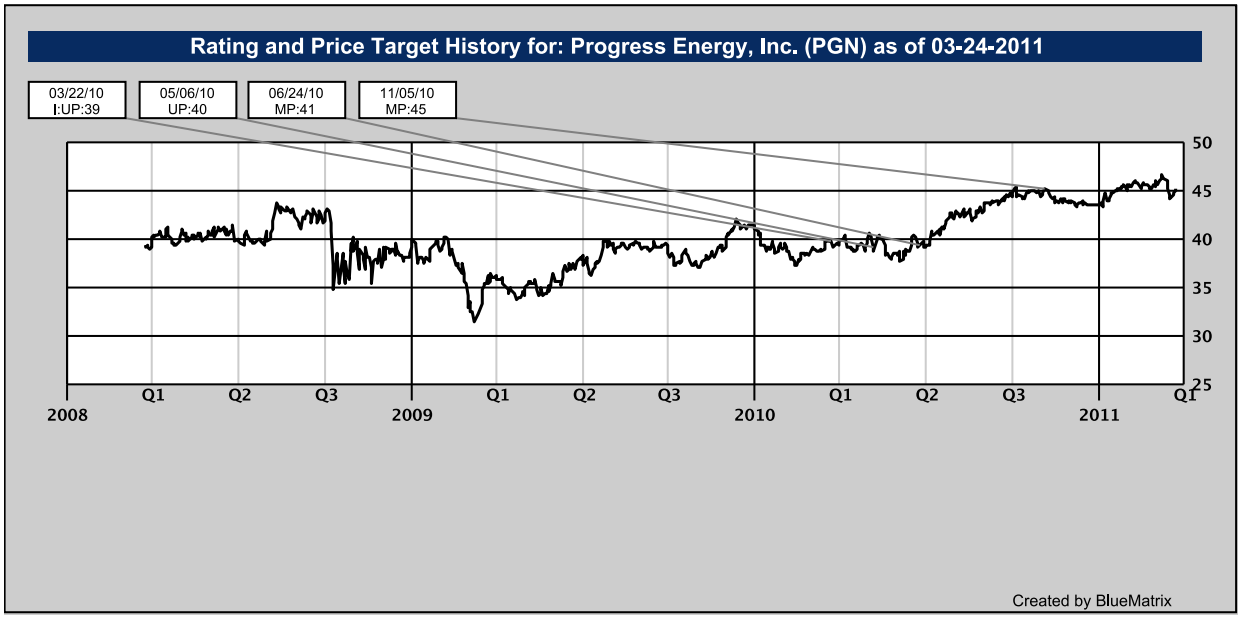
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06/24/10
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11/05/10
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35
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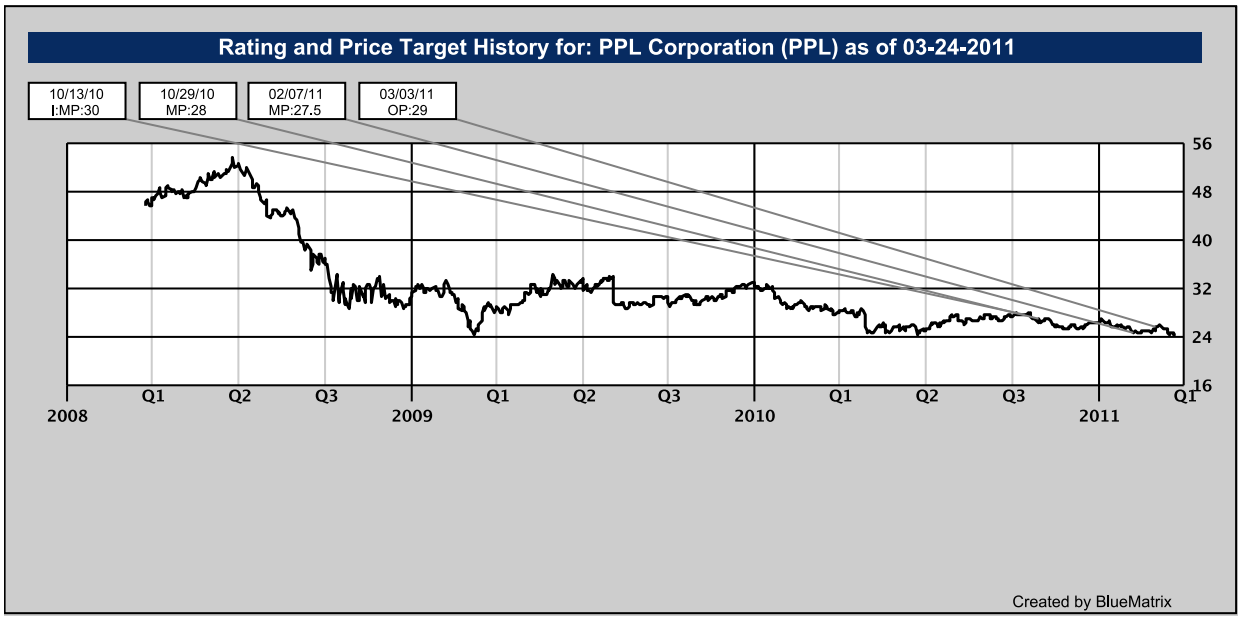
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02/07/11
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03/03/11
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32
24
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Q2
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Q2
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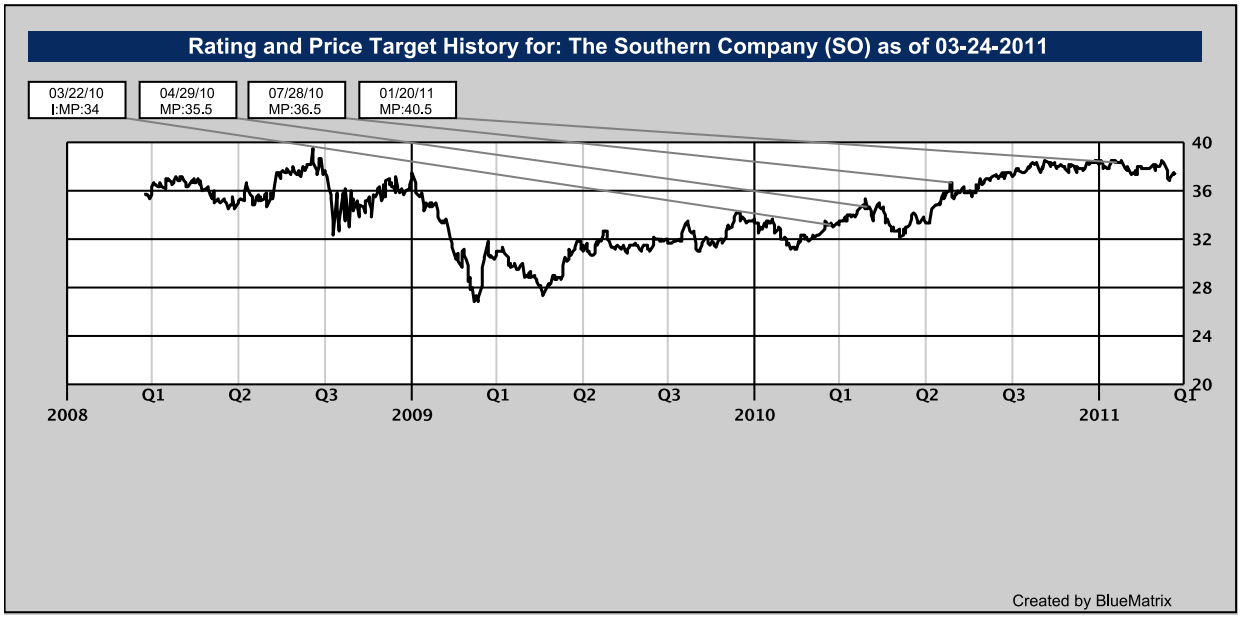
Rating and Price Target History for: The Southern Company (SO) as of 03-24-2011
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32
28
24
20
Q1
Q2
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Q2
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2008
2009
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2011
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COAL UNIT RETIREMENTS[1]

As of December 30, 2015

- Since 2010, utilities have announced the retirement of a very large number of coal-fired electric generating units.[2] In addition to these retirements, some coal units are converting to natural gas, and a small number are converting to biomass or another fuel. Most of these retirements and conversions have been attributed to EPA policies, although other factors may play a role too.[3]

- Table 1 lists 37 states with coal retirements and conversions that have been attributed to EPA policies. These retirements and conversions total 410 units and represent nearly 67,000 megawatts (MW) of electric generating capacity. Approximately 12,000 MW (one-fifth of the total) are converting to natural gas, biomass, or another fuel. By the end of 2016, 51,481 MW will retire or convert due to EPA policies.

- Table 2 lists all announced coal retirements and conversions, regardless of cause, through 2030. (Table 2 includes the units in Table 1 plus additional retirements and conversions that have not been attributed to EPA policies.) Table 2 shows that 499 units — totaling over 81,000 MW — are slated for retirement or conversion. These units are located in 42 states and represent 26% of the U.S. coal fleet that existed in 2010. Approximately 14,000 MW (slightly less than one-fifth of the total) are converting to natural gas, biomass, or another fuel.

- By the end of 2015, approximately 50,000 MW will have retired or converted. Between 2016 and 2019, an additional 22,000 MW are expected to retire or convert.[4]

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[1] This list of retirements and conversions is based primarily on public announcements by the owners of the coal units. We also use other information sources that are highly reliable. These retirements and conversions are not based on modeling projections.

[2] In 2010, according to EIA, the U.S. coal fleet was comprised of 1,396 electric generating units at 580 power plants that represented a total electric generating capacity of more than 315,000 MW.

[3] "EPA policies" include EPA regulations, as well as settlement agreements resulting from EPA's New Source Review enforcement activities. Other factors contributing to the shutdowns in Table 1 include low natural gas prices.

[4] 4,831 MW are slated to retire or convert after 2025.

TABLE 1. Coal Units Retiring or Converting Because of EPA Policies[5]

STATE	MW CLOSING OR CONVERTING	UNITS CLOSING OR CONVERTING
1. Ohio	6,421	40
2. Pennsylvania	5,548	30
3. Alabama	5,166	26
4. Indiana	4,308	25
5. Kentucky	3,471	16
6. Georgia	3,249	15
7. Illinois	2,996	13
8. North Carolina	2,783	20
9. West Virginia	2,737	18
10. Virginia	2,354	16
11. Tennessee	2,299	15
12. Minnesota	2,014	13
13. South Carolina	1,759	14
14. Missouri	1,738	17
15. Arkansas	1,659	2
16. Florida	1,568	7
17. Iowa	1,564	28
18. Oklahoma	1,464	3
19. Massachusetts	1,408	6
20. Texas	1,399	3
21. New Mexico	1,375	5
22. Michigan	1,352	16
23. Maryland	1,319	7
24. Wisconsin	1,287	16
25. Colorado	1,172	11
26. Arizona	822	4
27. Mississippi	706	2
28. Nebraska	637	5
29. Oregon	585	1
30. Louisiana	575	1
31. New York	475	3
32. New Jersey	268	2
33. Utah	172	2
34. Montana	154	1
35. Kansas	92	2
36. Wyoming	49	4
37. South Dakota	22	1
	66,967 MW	410 UNITS

[5] Most of the coal units listed in the table are retiring; 74 units representing 12,440 MW are converting to natural gas, biomass, or another fuel.

TABLE 2. All Coal Units Retiring or Converting[6]

STATE	MW CLOSING OR CONVERTING	UNITS CLOSING OR CONVERTING
1. Ohio	7,751	43
2. Pennsylvania	5,737	33
3. Alabama	5,166	26
4. Indiana	4,748	30
5. North Carolina	4,288	33
6. Illinois	4,261	18
7. Georgia	3,752	17
8. Kentucky	3,471	16
9. Virginia	2,836	21
10. West Virginia	2,737	18
11. Nevada	2,689	8
12. Tennessee	2,299	15
13. Minnesota	2,152	15
14. Utah	2,072	7
15. Iowa	1,832	32
16. South Carolina	1,759	14
17. Missouri	1,755	18
18. Arkansas	1,659	2
19. New York	1,588	13
20. Florida	1,568	7
21. Wisconsin	1,525	23
22. Massachusetts	1,517	7
23. Oklahoma	1,464	3
24. Michigan	1,433	19
25. Texas	1,399	3
26. Washington	1,376	2
27. New Mexico	1,375	5
28. Maryland	1,319	7
29. Colorado	1,172	11
30. Arizona	822	4
31. Nebraska	757	6
32. Mississippi	706	2
33. Oregon	585	1
34. Louisiana	575	1
35. Delaware	360	4
36. New Jersey	291	3
37. Connecticut	181	1
38. Montana	154	1
39. California	129	3
40. Kansas	92	2
41. Wyoming	49	4
42. South Dakota	22	1
	81,423 MW	**499 UNITS**

[6] Most of the coal units in the table are retiring; 93 units representing 13,890 MW are converting to natural gas, biomass, or another fuel.