Can a Stew of **Power Generation Regulations** *Clear the Air?*

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The U.S. Environmental Protection Agency's activities to reduce carbon emissions under the Clean Air Act have attracted significant interest, but the agency's work developing and issuing a stew of major rules to reduce conventional pollutants, including sulfur dioxide (SO_2) and nitrogen oxides (NO_x), merits much more attention. The reason is they may cost the electric utility sector in general, and coal-fired plants in particular, tens of billions of dollars per year.

With this collection of rules, utilities will likely be required to install costly new emissions control equipment over the next five years, significantly raising the cost of generating electricity from the coal-fired units currently operating without flue gas desulfurization controls for SO_2 emissions or synthetic catalytic reduction (SCR) units for control of NO_x, roughly one-third of plants in EPA's base case. These two control systems can achieve state-of-the-art control of SO_2 and NO_x, reducing emissions by greater than 90 percent. This increase in control costs may render a significant fraction of this generation capacity uneconomic and force its retirement from the coal-fired fleet.

EPA is moving forward with these rules in response to a set of independent and unrelated court decisions, settlement agreements, and statutory requirements. As a result, the proposed rules appear not to be ordered or coordinated in a manner that reflects a deliberate consideration of how to achieve the greatest environmental improvement for a given regulatory burden. A more coordinated grand bargain—including a program to limit greenhouse gas emissions—may achieve comparable emissions reductions with lower net costs and smaller increases in electricity prices.

What follows is the stew recipe—a complicated chronology of ongoing and forthcoming rulemaking.

Ongoing Regulations

This August, EPA published its proposed Federal Transport Rule as a replacement to the Clean Air Interstate Rule (CAIR). The 2005 CAIR established a regional cap-and-trade program to reduce electric utility SO_2 and NO_x emissions in the eastern United States. In 2008, the DC Circuit remanded CAIR to EPA, requiring the agency to replace the rule with a new one that would repair the significant CAIR flaws identified by the court. The proposed transport rule would significantly limit trading and banking (as compared to CAIR) and advance by one year the second phase SO_2 and NO_x emissions caps.

The effect of these changes will be to force a faster reduction of SO_2 and NO_x emissions as compared to CAIR, reducing the generation of coal-fired electricity in 2012 and beyond. The regulatory impact analysis accompanying the proposal estimates that the proposed transport rule will have only a modest effect on coal-fired electricity generation. The regulatory impact analysis projects that the transport rule will render 1.2 gigawatts (GW) of coal-fired capacity as uneconomic and reduce carbon dioxide (CO_2) emissions by 15.2 million tons in 2014 (versus EPA's projected emissions for its 2014 base case).

EPA, however, may have to further tighten the transport rule to meet a new National Ambient Air Quality Standard (NAAQS) for ozone, which is expected to issue in final form before the end of this year. On January 19, 2010, based on its reconsideration of the NAAQS for ozone set equal to .075 parts per million (ppm) in March 2008, EPA proposed an ozone NAAQS to protect public health "within the range of .060 ppm to .070 ppm."

A more stringent standard for the ozone NAAQS would likely require EPA to revise the NO_x emissions caps in its transport rulemaking. In fact, the proposed rule discusses the possibility of further revisions, as follows: "For future ozone and $PM_{2.5}$ NAAQS, EPA intends to quantify the emissions reductions needed to satisfy the requirements of 110(a)(2)(D)(i)(I) with respect to those NAAQS." (75 FR 45300).

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EPA also plans to issue a National Emissions Standard for Hazardous Air Pollutants (NESHAP) for coal- and oil-fired electric utility steam-generating units. EPA published a final rule requiring reductions in emissions of mercury from electric generating units (EGUs) in May 2005. The DC Circuit Court vacated that rule in 2008, requiring EPA instead to issue regulations of coal- or oil-fired EGUs under the Section 112 air toxics provisions of the Clean Air Act (CAA).

EPA plans to issue a proposal in March 2011 and a final rule by the end of that year. A stringent air toxics rule could result in the retirement of a number of older coal-fired power plants. Earlier this year, EPA proposed a NESHAP for industrial boilers that would establish stringent emissions standards for acid gases, a requirement that would require the installation of specific scrubbers for boilers lacking such controls. ("Acid gases" refers to the hydrogen chloride, hydrogen fluoride, and other gases that are formed in the combustion of fossil fuels.)

If EPA were to adopt similar requirements for coal-fired EGUs, electric utilities would likely retire a significant number of older coal-fired plants—roughly one-third of coal-fired plants do not have acid gas scrubber controls in place—rather than install the very expensive flue gas desulfurization scrubbers. In addition, this rulemaking may establish very stringent particulate matter (PM) limits (as a surrogate for the control of metals emissions) requiring an additional commitment of capital at coal-fired units that must replace or augment existing electrostatic precipitator equipment with bag houses.

Finally, EPA is reviewing the NAAQS for particulate matter. Under the CAA, EPA is required to review and, if appropriate, revise the NAAQS standards every five years. On October 17, 2006, EPA published its final rule revising the particulate matter NAAQS for the 24-hour fine PM standard, leaving in place the annual fine PM standard of 15 micrograms per cubic meter ($\mu g/m^3$), issued in 1997. EPA initiated its current round of NAAQS reviews in 2007 and plans to issue a proposal on whether to retain or revise the NAAQS for particulate matter by the end of this year, with a final determination and rule by September 2011. A final rule revising the NAAQS for particulate matter (by adopting a standard more stringent than the current

A Complicated Chronology

RULE	PROPOSED	FINAL
Transport Rule	July 2, 2010	April 2011
Ozone NAAQS Reconsideration	January 19, 2010	December 2010
Particulate Matter NAAQS	January 2011	October 2011
Air Toxics Maximum Achievable Control Technology (MACT)	March 2011	January 2012
Cooling Water Intake	January 2011	July 2012
Coal Combustion Waste	June 21, 2010	July 2011

Source: US EPA, Semi-annual Regulatory Agenda, Spring 2010.

annual standard of 15 μg/m^3 or the current 24-hour standard of 35 μg/m^3) would likely require the SO_2 and NO_x annual emissions caps to be tightened further in the upcoming transport rule.

In addition to these CAA rules, EPA is developing other major rules affecting coal-fired power plants. One would list coal ash as a hazardous waste under the Resource Conservation and Recovery Act and likely impose significant additional costs on the disposal of fly and bottom ash and scrubber sludge from coal-fired units. Another would establish new requirements for cooling water intake structures—potentially requiring cooling towers at all electric utility plants—under Section 316(b) of the Clean Water Act.

Missing from this stew, but not from the kitchen pantry, is a regulation setting new efficiency standards to control greenhouse gas emissions under the CAA. As discussed elsewhere in this volume, EPA has authority to issue such a regulation but has not yet proposed it.

A Legislative Bargain

While this is not a complete list of pending rules affecting coal-fired power generators, it is easy to see how pending regulatory actions complicate investment planning by utilities. Given the uncertain future of congressional and EPA efforts to regulate carbon emissions from EGUs, electric utilities are at a financial crossroads, having to choose whether to make the investments required by this array of prospective rules, may given the potential that they become "stranded" by future carbon regulations or, alternatively, to retire these coal-fired EGUs and replace them with other power sources.

In a recent report, the North American Electric Reliability Corporation (NERC) projected that four of these upcoming EPA rules—the transport rule, the (NESHAP) air toxics rule, the Section 316(b) cooling water rule, and the coal combustion waste rule—could force the retirement of roughly 50 (or more) GW of electric generating capacity. (NERC is an international regulatory authority established to evaluate reliability of the bulk power system in North America.) Given the potential magnitude of these retirements on the reliability of the electricity supply system, NERC emphasized the importance of a coordinated effort by the industry and EPA, FERC, DOE, and the state regulators to moderate the impacts on the bulk power system.

A grand bargain, including a program limiting greenhouse gas emissions from the electric utility sector, would set out a reasonable and certain regulatory path over the next decade. This legislative bargain—a simpler recipe—could resolve the complicated decisions arising from the array of requirements facing the electric utility industry under the current environmental statutes, as interpreted by the agency and the courts. And the nation could benefit by achieving substantial, beneficial emissions reductions at significantly less cost.

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