

**Power Sector Regulation Under the Clean Air Act:  
Considerations for Coal Dependent States**

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# Power Sector Regulation Under the Clean Air Act: Considerations for Coal Dependent States

## ***Background***

The Center for Energy and Sustainable Development at WVU College of Law is developing a series of discussion papers on U.S. Environmental Protection Agency (EPA) regulations aimed at reducing carbon dioxide (CO<sub>2</sub>) emissions from the electric power sector. The discussion papers complement other Center initiatives aimed at assisting policymakers in navigating these issues and charting a sustainable energy future for West Virginia.

Coal fired power plants supplied 50 percent of the US electricity supply in 2007<sup>1</sup> but just 37 percent in 2012.<sup>2</sup> Older, less efficient coal plants are being retired in response to more stringent environmental regulations and shifts in energy markets that reduce the cost-competitiveness of coal relative to other electric generation fuels, such as natural gas. Although long-term projections show that coal will remain an important fuel source for electric generation, advances in natural gas development and in clean energy technologies mark a shift in the electric sector away from coal and toward cleaner energy resources.<sup>3</sup> Market-driven trends will likely be hastened as regulations aimed at limiting mercury, particulate matter, CO<sub>2</sub>, and other airborne pollutants become more stringent. The shift away from coal as the dominant electric generating fuel portend significant challenges for states that heavily rely on coal for electric power and other economic development benefits. These challenges highlight the need for policymakers to consider energy supply diversification and to prepare for an economic future that is resilient to declining demand for coal.

This paper summarizes proposed EPA regulation of CO<sub>2</sub> emissions from the power sector under the Clean Air Act (CAA) and considers policy measures that could help states adapt to evolving energy markets and regulatory changes. The rules for new power plants issued pursuant to Section 111(b), and forthcoming rules for existing power plants pursuant to Section 111(d), are reviewed and considerations for states are highlighted.

## ***Performance Standards for CO<sub>2</sub> Emissions from New Power Plants: Separate Standards for Coal and Natural Gas***

The President released his Climate Action Plan in July 2013 calling for a 17 percent reduction in CO<sub>2</sub> emissions by 2020 from 2005 levels.<sup>4</sup> A cornerstone of the Climate Action Plan calls upon EPA to develop standards to limit CO<sub>2</sub> emissions from new and existing

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<sup>1</sup> US Energy Information Administration, *Energy In Brief: What is the Role of Coal in the United States?* (Aug. 16, 2013) [http://www.eia.gov/energy\\_in\\_brief/article/role\\_coal\\_us.cfm](http://www.eia.gov/energy_in_brief/article/role_coal_us.cfm).

<sup>2</sup> U.S. Energy Information Administration, AEO 2014 EARLY RELEASE OVERVIEW (Dec. 16, 2013) *available at* [http://www.eia.gov/forecasts/aeo/er/pdf/0383er\(2014\).pdf](http://www.eia.gov/forecasts/aeo/er/pdf/0383er(2014).pdf).

<sup>3</sup> *Id.* (predicting that coal will continue to supply over one third of US electric demand through 2040).

<sup>4</sup> Executive Office of the President, PRESIDENT'S CLIMATE ACTION PLAN (June 2013) *available at* <http://www.whitehouse.gov/sites/default/files/image/president27sclimateactionplan.pdf>.

power plants pursuant to the Agency's authority under the CAA. On January 8, 2014 EPA published new source performance standards (NSPS) for CO<sub>2</sub> emissions from new power plants under Section 111(b).<sup>5</sup> The EPA rules are of particular consequence to coal plant operators and coal producers, as coal fired power plants contribute approximately 80 percent of power sector CO<sub>2</sub> emissions<sup>6</sup> and over 80 percent of domestic coal production is used for electricity generation.<sup>7</sup>

The proposed NSPS rule would limit new coal power plant emissions to 1,100 lbs of CO<sub>2</sub>/MWh. Natural gas plants would be limited to 1,000 lbs of CO<sub>2</sub>/MWh for large units and 1,100 lbs of CO<sub>2</sub>/MWh for small units.<sup>8</sup> To meet the standard, new coal plants will have to include a pollution control technology known as carbon capture and storage (CCS).<sup>9</sup> CCS is being implemented for the first time on a commercial scale at several power plants under construction in the U.S. and Canada.<sup>10</sup> New natural gas plants will comply with the emissions standard without additional pollution controls by using natural gas combined cycle (NGCC) technology, the current industry standard.

The NSPS rule includes alternative codification schemes for the emission standards for new power plants. The first alternative would codify the standards for the two source categories under existing sections of the Code of Federal Regulations (CFR) while the second alternative would codify the standards under a new section of the CFR.<sup>11</sup> EPA solicited comments on the merits of each approach:

[W]e seek comment on whether the co-proposal to combine the categories and codify the GHG standards for all new affected sources in [a new] subpart will offer . . . additional flexibility for . . . emission guidelines for existing sources, for example, by facilitating a system-

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<sup>5</sup> STANDARDS OF PERFORMANCE FOR GREENHOUSE GAS EMISSIONS FROM NEW STATIONARY SOURCES: ELECTRIC UTILITY GENERATING UNITS, 79 Fed. Reg. 1430-01 (Jan. 8, 2014). At the same time, EPA withdrew the previously published Standards of Performance for Greenhouse Gas Emissions From New Stationary Sources: Electric Utility Generating Units, *see* 79 Fed. Reg. 1352 (Jan. 8, 2014).

<sup>6</sup> US EPA, Sources of Greenhouse Gas Emissions <http://www.epa.gov/climatechange/ghgemissions/sources/electricity.html>.

<sup>7</sup> US Energy Information Administration, *Energy In Brief: What is the Role of Coal in the United States?* (Aug. 16, 2013) [http://www.eia.gov/energy\\_in\\_brief/article/role\\_coal\\_us.cfm](http://www.eia.gov/energy_in_brief/article/role_coal_us.cfm).

<sup>8</sup> EPA set separate emission standards for "large" natural gas units – those with a heat input rating of 850 MMBtu/hr or greater and "small" – those with a heat input rating of 850 MMBtu/hr or less.

<sup>9</sup> CCS is a process by which the carbon generated from the combustion of fossil fuels is captured at the smokestack before it is released to the atmosphere and is then stored underground. Full CCS is defined as a carbon capture rate of 90 percent or greater.

<sup>10</sup> *See, e.g.,* Mississippi Power Kemper County Energy Facility, <http://www.mississippipower.com/kemper/home.asp>

<sup>11</sup> STANDARDS OF PERFORMANCE FOR GREENHOUSE GAS EMISSIONS FROM NEW STATIONARY SOURCES: ELECTRIC UTILITY GENERATING UNITS, 79 Fed. Reg. 1430, 1454 (Jan. 8, 2014).

wide approach, such as emission rate averaging, that covers [coal and natural gas units].<sup>12</sup>

Whether either co-proposal offers more flexibility than the other is an important question. The NSPS rule could be finalized as early as June 2014; at which time EPA is expected to issue proposed rules to regulate CO<sub>2</sub> emissions from existing power plants pursuant to Section 111(d) of the CAA. Ensuring that EPA has maximum flexibility to craft the standards for existing power plants under Section 111(d) will allow states greater latitude in designing and implementing performance standards and provide regulated entities more cost-effective compliance options.

### ***Performance Standards for CO<sub>2</sub> Emissions from Existing Power Plants: Regulatory Flexibility and Cost Effective Compliance Options***

The language of Section 111(d), and EPA's implementing regulations, provide EPA flexibility in selecting the best system of emission reduction (BSER) and setting the emission guidelines. States have flexibility to design a system of emission reduction of their choosing so long as the system selected achieves emission reductions equivalent to or greater than those required by EPA, and adheres to the guidance document. In its simplest form, the rulemaking process for Section 111(d) involves three steps:

1. EPA issues a guideline document that provides a description of systems of emission reduction that have been adequately demonstrated, information about the emission reductions achievable with each system, the costs and environmental effects of applying each system and identifies a "best system of emission reduction" under which emission guidelines are issued.<sup>13</sup>
2. States then develop plans that establish standards of performance for existing sources and provide for their implementation and enforcement based on the emission guidelines set forth in the guidance document.<sup>14</sup>
3. EPA then approves or denies each state plan based on criteria set forth in the guideline document. If EPA approves the plan, the state becomes a delegated state and implementation and enforcement responsibilities fall upon the state. If EPA denies the plan, the Agency may develop a federal plan for the state.<sup>15</sup>

Regulating CO<sub>2</sub> emissions from the power sector pursuant to Section 111(d) presents a number of challenges to EPA, states and regulated entities. Regional differences in electric generation create the potential for the existing source performance standards to disproportionately impact states that rely heavily on coal fired electricity. West Virginia, which generates nearly 97 percent of its electricity from coal, will face the challenge of

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<sup>12</sup> *Id.* at 1454-55.

<sup>13</sup> 40 C.F.R. §60.22.

<sup>14</sup> 42 U.S.C. §7411(d)(1). The submission of state plans pursuant to Section 111(d) follows the procedure established for the submission of state plans pursuant to the National Ambient Air Quality Standard (NAAQS) program under Section 110 of the CAA.

<sup>15</sup> 42 U.S.C. §7411(d)(2).

designing a program that meets the EPA emission guidelines, while still enabling regulated entities to achieve compliance in a cost-effective manner.

While the CAA language is broad and provides EPA and states some flexibility in the ultimate design and implementation of performance standards, EPA, states and the courts have limited experience interpreting and implementing Section 111(d). The challenge for EPA will be to craft a legally defensible rule that permits states the flexibility to develop performance standards producing credible emission reductions while at the same time recognizing the physical limitations of incumbent generation assets, costs of control, geographic limitations, differences in regional electricity markets, and other factors to ensure that the standards are achievable from a technological and cost perspective. An EPA guideline document that accounts for these regional differences is critical to balancing national environmental benefits with regional compliance cost considerations.

With these considerations in mind, a guideline that prescribes a national uniform standard would provide undesirable, and disproportionate, regional and power sector impacts, as those states and power producers that rely heavily on coal-fired assets will bear a greater burden of reducing CO<sub>2</sub> emissions. A guideline that give states flexibility to set performance standards and design implementation plans that account for the heterogeneity of the existing power fleet, and employ “outside the fence line” compliance mechanisms, will allow states to develop more targeted, cost-effective strategies for emission reductions.

### ***Increasingly Flexible Compliance Options Will Likely Result in Increasingly Stringent Performance Standards***

There are a number of different emission reduction systems that EPA will consider in the guideline document and each come with varying degrees of cost effectiveness and emission reduction benefits. Different systems also come with varying degrees of legal certainty and regulatory flexibility in terms of where, how, and by whom emission reductions may be achieved. As an emission reduction system becomes more flexible, the performance standards—or amount of emissions reductions that EPA will require—become more stringent and the legal footing upon which they stand becomes less certain. Examples of some characteristics of systems that have been discussed include:

- *Reductions achieved “inside the fence line” at individual generating units from supply side efficiency upgrades (heat rate improvements), fuel switching or co-firing with lower carbon fuels.* This system is considered the least desirable from an emission reduction perspective because it provides limited flexibility to achieve emission reductions as there are limited opportunities to increase efficiencies on a unit-specific basis. Emission reductions achieved under this system are more costly relative to other systems as well, but this system provides a high degree of legal certainty as EPA has set performance standards pursuant to 111(d) in this manner in the past.<sup>16</sup>
- *Reductions achieved on a utility wide basis by shifting generation among regulated sources from higher to lower emitting units and utilizing market based compliance mechanisms such as emission rate trading, averaging and banking.* This system allows power plant operators greater flexibility than a system dependent upon reductions

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<sup>16</sup> 40 C.F.R. § 60.33b.

at individual units. By allowing operators to achieve emissions reductions within a larger system—such as a utility’s entire fleet or on a statewide basis, as opposed to the individual unit basis—provides greater cost-effectiveness as power plant operators could spread the emission reduction burden out over a greater number of units. This system also provides a relatively high level of legal certainty, as EPA has allowed emission averaging under Section 111(d) in the past.<sup>17</sup>

- *Reductions achieved “outside the fence line” by shifting fossil fuel generation to non-fossil fuel generation (e.g. renewables, nuclear) and reducing electricity demand by increasing the deployment of end-use energy efficiency and demand side management resources.* This system could be implemented, for example, on a utility wide or on a state or multi-state jurisdictional level. It provides a high degree of flexibility and improves the cost-effectiveness of emission reductions. A system that identifies outside the fence line reductions does not provide the high degree of legal certainty as an “inside the fence line” system, however, because it would allow emission offsets.

When considering the regulatory framework under which emission guidelines will be issued, it is helpful to consider the scope of the system within which reductions will be required and how compliance will be measured. In its simplest form, EPA could identify a BSER based on the emission reductions that could be achieved within a specified compliance boundary (e.g., on an individual unit, multi-unit (utility wide), state, or regional (multi-state) level) and set emission guidelines on a mass or a rate basis.<sup>18</sup> The compliance boundary EPA identifies or allows, and the compliance options EPA identifies or allows—inside the fence line, outside the fence line, or a combination of the two—is directly related to the cost of reducing emissions and amount of emission reductions that can be achieved.

Many states and other observers are urging EPA to issue guidelines that provide states flexibility to select a system of emission reduction, system boundary, and performance standard metric that is most practical for each state, or group of states.<sup>19</sup> As states are afforded greater flexibility in the selection of systems of emission reduction, however, performance standards become more stringent. For instance, the emissions guidelines for a system of emission reduction that allows only for inside the fence line reductions on an individual unit basis will necessarily be less stringent than one that allows for outside the fence line reductions on a state wide basis. This is simply because the opportunity for emissions reductions are significantly less and cost more to achieve, for the former. In order to achieve emission reductions that will meet the President’s climate action goals, EPA will need to issue guidelines that allow states the flexibility to include a range of compliance

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<sup>17</sup> 40 C.F.R. § 60.33b(d).

<sup>18</sup> A compliance metric set on a mass basis would limit total CO<sub>2</sub> emissions within the specified compliance boundary (e.g. per unit, or within a state) while a rate basis would limit CO<sub>2</sub> emissions per MWh of electricity produced within the specified compliance boundary (e.g. per unit, within a state).

<sup>19</sup> *See, e.g., STATES’ §111(D) IMPLEMENTATION GROUP INPUT TO EPA ON CARBON POLLUTION STANDARDS FOR EXISTING POWER PLANTS (Dec. 16, 2013) available at [http://www.georgetownclimate.org/sites/default/files/EPA\\_Submission\\_from\\_States-FinalCompl.pdf](http://www.georgetownclimate.org/sites/default/files/EPA_Submission_from_States-FinalCompl.pdf).*

options that states have demonstrated can cost-effectively reduce emissions.<sup>20</sup> This will likely mean providing states the flexibility to include outside the fence line reductions on a state or regional level.

Accordingly, states with a diversity of fossil generation sources, renewable energy resources, energy efficiency, demand side management programs, and other policies that promote the integration of low carbon resources, will be better equipped to set performance standards and design implementation plans that allow power plant operators the most cost-effective emission reduction compliance tools. States with relatively undiversified generation portfolios, limited renewable resources or demand-side management programs reduce their potential to expand the scope of their system or incorporate flexible compliance tools into state implementation plans, and could face higher compliance costs.

### ***Next Steps***

The development and implementation of CAA regulations for power sector CO<sub>2</sub> emissions invoke thorny legal, economic, engineering and other challenges that require stakeholder involvement and interagency coordination on the federal and state level to solve. Engagement in the rulemaking process provides valuable opportunities for state policy makers to contribute to the development of EPA guidelines, coordinate with counterparts in other states and identify new strategies for the development of performance standards and implementation plans that best fit the needs of particular states or regions.

The proposed NSPS rule, if finalized as proposed, will require the use of costly emissions reduction technology for new coal plants. At the same time, very few new coal fired power plant projects are currently included in U.S. utilities' or power producers' long term resource acquisition plans. Market analyses show that the cost-competitiveness of coal compared to other generating fuels, such as natural gas, has declined in recent years and that rising construction and compliance costs for new coal plants have contributed to the decline in plans to build new ones.<sup>21</sup>

While coal is expected to continue to play a central role in meeting U.S. electricity demand in the coming decades, the broader shifts occurring in the power sector portend reduced demand for coal from current levels.<sup>22</sup> Regulatory policy has some influence on the cost-competitiveness of different fuel types and generation technologies, but steady declines in the cost of renewable energy technologies and low natural gas prices have led the shift in long term resource planning away from coal. Depending upon final policy design, the regulation of CO<sub>2</sub> emissions from existing power plants could hasten the shift away from coal-fired generation.<sup>23</sup> Given this outlook, West Virginia, and other states that rely heavily

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<sup>20</sup> See, e.g., *id.* for examples.

<sup>21</sup> US Energy Information Administration, AEO 2014 EARLY RELEASE OVERVIEW (Dec. 16, 2013) available at [http://www.eia.gov/forecasts/aeo/er/pdf/0383er\(2014\).pdf](http://www.eia.gov/forecasts/aeo/er/pdf/0383er(2014).pdf).

<sup>22</sup> *Id.* (projecting that coal will supply 32% of US electric demand in 2040).

<sup>23</sup> See US Energy Information Administration: *Energy in Brief, What is the Role of Coal in the United States?* (Aug. 16, 2013)

[http://www.eia.gov/energy\\_in\\_brief/article/role\\_coal\\_us.cfm](http://www.eia.gov/energy_in_brief/article/role_coal_us.cfm) (noting that “[w]hile the share of our total net electricity generated from coal is expected to decrease by 2040, the amount of coal used

on coal for electric generation, and on coal mining as a major driver of economic development, face the challenge of diversifying their electricity portfolio and economic base to prepare for a future in which coal plays a reduced role in meeting the nation's electricity needs.

The economic impacts of these market and regulatory changes can be reduced, particularly in coal producing regions and states heavily reliant on coal for electric generation, if state policymakers engage in the EPA rulemaking process and work to ensure that the guidelines are crafted to allow states to develop performance standards and implementation plans that incorporate flexible compliance strategies. State policymakers should explore opportunities to diversify fossil fuel-fired generation resources, expand capacity in renewable and other low carbon generation resources, and take advantage of energy efficiency and other demand side management resources to reduce CO<sub>2</sub> emissions.

West Virginia, and other states that generate a large percentage of their electricity from coal, will likely find more flexible strategies to reduce CO<sub>2</sub> emissions attractive, as these afford regulated entities more cost-effective options to secure emission reductions. State energy and air regulators play a central role in assessing the potential for existing policies to create opportunity for emission reductions and can work together to identify areas in which new legislation or regulatory policy revisions could create additional opportunities. Policies that promote diversification of the energy supply will complement other efforts to promote new opportunities for economic growth and job creation.

Public comments on the proposed NSPS rule will be accepted until March 10, 2014.<sup>24</sup> A final NSPS rule is expected by June 2014, at which time EPA is expected to issue the draft guidelines and rules for CO<sub>2</sub> emissions from existing power plants. The existing power plant rule is expected to be finalized by June 2015 and include a requirement that states submit state implementation plans by June 30, 2016.<sup>25</sup>

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to meet growing demand for power is expected to increase in the absence of new policies to limit or reduce emissions of carbon dioxide and other greenhouse gases. *Revised emissions policies, however, could significantly change the outlook for domestic coal use.*" emphasis added).

<sup>24</sup> STANDARDS OF PERFORMANCE FOR GREENHOUSE GAS EMISSIONS FROM NEW STATIONARY SOURCES: ELECTRIC UTILITY GENERATING UNITS, 79 Fed. Reg. 1430 (Jan. 8, 2014).

<sup>25</sup> Memorandum from the White House Office of the Press Sec'y to the Adm'r of the Env'tl. Prot. Agency, Power Sector Carbon Pollution Standards (June 25, 2013) *available at* <http://www.whitehouse.gov/the-press-office/2013/06/25/presidential-memorandum-power-sector-carbon-pollution-standards>.