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Initial Impressions of EPA’s Final Section 111(b) and (d) Rules Regulating CO₂ Emissions from New & Existing Power Plants

This memorandum provides the Carbon Management Institute’s (CMI) initial impressions of the U.S. Environmental Protection Agency’s (EPA) final Clean Air Act section 111(b) and (d) rules and related requirements regulating carbon dioxide (CO₂) emissions from new and existing electric utility generating units (EGUs), respectively.

Three rules were issued by EPA today: (1) Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: EGUs¹; (2) Carbon Pollution Emission Guidelines for Existing Stationary Sources: EGUs²; and (3) Federal Plan Requirements for Greenhouse Gas Emissions from EGUs Constructed on or Before January 8, 2014; Model Trading Rules; Amendments to Framework Regulations³.

All three rules were issued in pre-publication form, which means the clock has not yet started to run on comment periods and judicial review. For scheduling reasons, we anticipate that the rules will be officially published in the Federal Register on or about September 4 or 7, 2015.

This brief overview does not take a position on the legality of the three rules.

Collectively, the three rules consist of more than three thousand (3,000) pages of preamble and regulatory text, not counting the hundreds if not thousands of additional pages of supporting materials. In conjunction with its University partners in the coming weeks and months, CMI envisions providing interested parties with more detailed analyses of today’s developments once we have had sufficient time to digest them thoroughly.

I. The Rules

A. Requirements That Apply to New, Modified, and Reconstructed EGUs

Issued under section 111(b) of the Clean Air Act, the first rule applies to new, modified, and reconstructed EGUs. 42 U.S.C. § 7411(b). Section 111(b) directs EPA to publish “standards of performance for new sources” in certain circumstances. *Id.* § 7411(b)(1)(B). 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 non-air quality health and environmental impact

¹ <http://www.epa.gov/airquality/cpp/cps-final-rule.pdf>.

² <http://www.epa.gov/airquality/cpp/cpp-final-rule.pdf>.

³ <http://www.epa.gov/airquality/cpp/cpp-proposed-federal-plan.pdf>.

and energy requirements) the Administrator determined has been adequately demonstrated.” *Id.* § 7411(a)(1).

The operative language above is “best system of emission reduction,” or BSER.

The Clean Air Act and its implementing regulations define a “new source,” a “modification,” and a “reconstructed” source. For purposes of this rule: (1) a “new source” is a fossil fuel EGU that commenced construction on or after January 8, 2014; (2) a “modification” is any physical or operational change to an existing fossil fuel EGU that is modified on or after June 18, 2014; and (3) a “reconstructed” source is an existing EGU that replaces components on or after June 18, 2014 to such an extent that the capital cost of the new components exceeds 50% of the capital cost of a new EGU.

Sorted among the “new source,” “modification” and “reconstructed” source categories, EPA determined separate BSER for two types of fossil fuel EGUs –

✓ *Stationary Combustion Turbines (i.e., natural gas).*

The BSER for new and reconstructed stationary combustion turbines (CT) is natural gas combined cycle (CCNG) technology. Regardless of size, baseload CTs must meet a standard of 1,000 pounds (lbs) of CO₂ per megawatt-hour on a gross-output basis (lbs CO₂/MWh-gross). Non-baseload units must meet a clean fuels input-based standard. The difference between baseload and non-baseload is case-by-case and a function of a unit’s nameplate design efficiency.

EPA elected not to set a BSER for modified CTs.

✓ *Steam-generating EGUs (i.e., coal).*

The BSER for new coal-fired power plants is a new highly efficient supercritical pulverized coal unit (SCPC) with partial carbon capture and storage (CCS). The emissions limit is 1,400 lbs CO₂/MWh-gross, which EPA states is achievable by SCPC capturing about 20% of its CO₂. This emission limit is a relaxation of the proposed 1,100 lbs CO₂/MWh-gross level. EPA also backed away from its proposed determination that Integrated Gasification Combined Cycle technology is part of the BSER.

Further as to CCS, EPA continues to maintain that the technology is available and technically feasible in this context. As in the proposal, EPA appears to be relying upon the use of CO₂ for enhanced oil recovery (CO₂-EOR). So when EPA says “CCS,” we interpret that to primarily mean “carbon capture utilization & storage,” or CCUS. That said, deep saline injections are also expected to play a role.

EPA continues to acknowledge that CO₂-EOR injections for storage purposes may continue to occur under Class II of the Safe Drinking Water Act’s Underground Injection Control program. Consistent with the proposal, the final rule also emphasizes that CO₂-EOR owners/operators purchasing CO₂ from a regulated EGU must opt into subpart RR of the Greenhouse Gas Reporting Program. Subpart RR carries with it a requirement for implementation of a federally approved monitoring, reporting and verification (MRV) plan. Such MRV plans are also subject to litigation by any interested party.

The EPA rejected arguments that the solid waste/hazardous waste status of CO₂ injected for EOR under the Resource Conservation & Recovery Act is a potential impediment to CO₂-EOR in this context. *Pre-publication final rule*, p. 410, n. 490.

Non-geologic storage options may be justified on a case-by-case basis. The final rule provides for a case-by-case adjudication by EPA of applications seeking to demonstrate to the EPA that a non-geologic sequestration technology would result in “permanent confinement of captured CO₂.”

The BSER for modified coal-fired power plants is based on each affected unit’s best potential performance – case-by-case, in other words. Modifications that result in an increase of hourly CO₂ emissions of less than or equal to 10% are exempt.

The BSER for reconstructed coal-fired power plants is the performance of the most efficient generating technology for these types of units. Sources with heat input: (1) greater than 2,000 MMBtu/hr must meet an emission limit of 1,800 lbs CO₂/MWh-gross; and (2) less than or equal to 2,000 MMBtu/hr must meet an emission limit of 2,000 lbs CO₂/MWh-gross.

Impacts on Prevention of Significant Deterioration (PSD) Permitting. Historically, standards of this type set the “floor” for Best Available Control Technology (BACT) assessments under the Clean Air Act’s separate pre-construction permitting program known as PSD. It is conceivable that EPA’s determinations today will increase the likelihood of partial CO₂ capture mandates appearing in PSD permitting proceedings, too. Earlier this year EPA assessed that CO₂-EOR was BACT for a natural gas separation plant.

B. Requirements That Apply to Existing EGUs

Issued under section 111(d) of the Clean Air Act, the second rule – better known as the “Clean Power Plan” or CPP -- applies to existing sources in the relevant source category: here, EGUs. *42 U.S.C. § 7411(d)*. Implementation of this little-used provision is largely untested but tries to mimic the “federalism” approach of the Clean Air Act across the board. Namely, the federal government sets basic standards, then the states – typically through the development of what are known as State Implementation Plans, or SIPs – implement the program under federal supervision.

The CPP’s goal is a 32% reduction in CO₂ emissions from power plants by 2030 from 2005 levels, an increase over the 30% reduction in the proposal.

The CPP establishes CO₂ emission performance rates for two subcategories of existing fossil fuel-fired EGUs: (1) fossil fuel-fired EGUs (generally, coal-fired power plants); and (2) CCNG or CTs (generally, natural gas plants).

Here, EPA determined that the BSER was based upon application of three so-called building blocks: (1) Block #1 (heat rate improvements at coal-fired power plants); (2) Block #2 (switching from coal to natural gas); and (3) Block #3 (switching from coal to renewables). For technical and related reasons, EPA dropped Block #4 (energy efficiency (EE)) which was proposed, although EE is expected to play an important role in the regulation going forward. EPA has apparently watered-down Block #2 by modeling greater penetration by renewables versus natural gas, although we continue to assess that aspect of the rule.

EPA has established interim and final statewide goals in three forms: (1) a rate-based state goal measured in pounds per megawatt hour (lb/MWh); (2) a mass-based state goal measured in total short tons of CO₂; and (3) a mass-based state goal with a new source complement measured in total short tons of CO₂.

States then develop and implement plans – effectively Carbon Implementation Plans (CIPs) instead of SIPs – that ensure that power plants in their state – either individually, together or in combination with other measures – achieve the interim CO₂ emissions performance rates over the period 2022 to 2029 and the final CO₂ emission performance rates, rate-based goals or mass-based goals in 2030 and later.

By September 6, 2016, states must submit their initial CIPs or request for an extension. If a state is granted an extension, it must submit (1) a progress update by September 6, 2017, and (2) a final CIP by September 6, 2018.

In developing their CIPs, states may choose between two plan types: (1) an “emission standard” plan that focuses on “inside-the-fence” controls on EGUs (using either rate-based or mass-based metrics); or (2) a “measures” plan that includes “outside-the-fence” measures. These “outside-the-fence” measures are not federally enforceable (indeed, they cannot be), must be back-stopped to ensure that targets are met, and could be viewed as cap-and-trade programs. EPA touts “emissions trading” as an economic path forward for the states. *EPA’s Clean Power Plan: The Clean Power Plan, Fact Sheet (Aug. 3, 2015)*. Trading would work via emission rate credits (ERCs) (for a rate-based standard) or allowances (for a mass-based standard).

The program includes a Clean Energy Incentive Program (CEIP) that incentivizes – through the issuance of ERCs (for a rate-based standard) or allowances (for a mass-based standard) – early, eligible investments during 2020-2021 in wind and solar generation, as well as demand-side energy efficiency program implemented in low-income communities. *EPA’s Clean Power Plan: Clean Energy Incentive Program, Fact Sheet (Aug. 3, 2015)*. EPA describes the CEIP as a “matching fund.”

C. Requirements That Apply to States Who Abstain

Among other things, the third rule provides a Federal Implementation Plan that would be imposed on those states that do not submit a CIP as described above. We are still assessing this document.

II. Wyoming Specific Considerations

Collectively, the three rules put the United States on a path towards a decarbonized energy system by 2100, with peaking of GHG emissions in the 2030 time frame. The rules are also consistent with international 2050 climate goals.

The three rules effectively mark the return of cap-and-trade under the CPP program.

The Administration appears to have backed away from its earlier view of natural gas as a “bridge fuel” to a so-called low-carbon economy. All fossil fuels should sit up and take notice. Climate policy is not just about coal.

The nuclear industry appears to have achieved some gains, which could be positive for uranium supplies.

CMI’s work on the WY-CUSP project appears more relevant than ever.⁴ Associated/incidental CO₂ storage via CO₂-EOR, in which CMI is also engaged, will continue to gain importance in the years and

⁴ <http://www.uwyo.edu/cmi/research-projects/project-wy-cusp.html>.

decades to come. ISO's ongoing work in developing CCUS standards, including those for storage via CO₂-EOR, is more important today than it was yesterday.

Subject to a myriad of complex policy, technical and commercial considerations, today's developments could in theory positively impact Wyoming's abundant renewable resources (wind, in particular). Whatever benefits these provide are unlikely to mitigate the challenges to the state's fossil resources: both coal and natural gas. Further analyses will be required.

To mitigate impacts on the coal industry and coal-producing states, the Administration indicates that its separate Power+ Plan "will invest in workers and jobs, address important legacy costs in coal country and drive the development of coal technology as our country moves to a clean energy economy." *EPA's Clean Power Plan: Resources for Communities, Fact Sheet (Aug. 3, 2015)*. A part of President Obama's FY2016 budget proposal, which Congress has already effectively discarded, the Power+ Plan would have provided: (1) monies to help coal miners transition into other careers, and (2) tax incentives for CCUS.⁵

Impacts in Wyoming will be influenced greatly by how other states respond to the CPP – a matter largely outside of Wyoming's control. If the CPP survives judicial challenges and efforts by Congress to repeal it, the best economic case for Wyoming may be if the rest of country adopts "outside-the-fence" controls, thereby ensuring that emission controls are not focused exclusively on coal-fired power plants. Such an approach could, in theory, ease the burden on coal-fired EGUs. Godby, R., et al., *The Impact of the Coal Economy on Wyoming* (Center for Energy Economics and Public Policy, University of Wyoming, Feb. 2015).⁶

Speaking of legislative repeal, the Senate Environment & Public Works Committee is meeting August 5th to mark up legislation challenging the CPP. Comparable legislation has previously advanced in the House. The outcome of these legislative debates is uncertain. If successful, they are likely to face a Presidential veto.

The White House has released fact sheets that summarize how the CPP would impact each state. The fact sheet for Wyoming does not use the term "coal" nor are coal-related economic impacts noted or discussed.⁷

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⁵ https://www.whitehouse.gov/sites/default/files/omb/budget/fy2016/assets/fact_sheets/investing-in-coal-communities-workers-and-technology-the-power-plan.pdf.

⁶ http://www.uwyo.edu/cee/_files/docs/WIA_Coal_Full-Report.pdf.

⁷ https://www.whitehouse.gov/sites/default/files/image/climate/Wyoming_Factsheet.pdf.