



John R. Kasich, Governor  
Mary Taylor, Lt. Governor  
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May 9, 2014

Air and Radiation Docket and Information Center  
Attention Docket ID No. EPA-HQ-OAR-2013-0495  
U.S. Environmental Protection Agency  
Mail Code: 2822T  
1200 Pennsylvania Avenue, NW  
Washington, DC 20460

Re: Comments on the Proposed Carbon Pollution Standards for New Power Plants

To whom it may concern:

The Ohio Environmental Protection Agency (Ohio EPA) is providing comment on the above-referenced proposed rule regarding the New Source Performance Standards (NSPS) for emissions of carbon dioxide (CO<sub>2</sub>) for new fossil fuel-fired electric utility generating units (EGUs). For the first time, U.S. EPA is establishing limits of carbon dioxide emissions for new fossil fuel-fired EGUs greater than 25 megawatts and suffice to say, we have great concerns with this proposed rule. To that end, Ohio EPA submits the following comments.

#### **A. Departure from Past NSPS Practices**

The proposed rule represents a significant departure from the established U.S. EPA precedent for NSPS implementation. Specifically, the proposed NSPS sets standards based on projected emissions of future projects as opposed to developing standards based on what is currently achieved in practice. Furthermore, U.S. EPA's proposed standards offer a competitive advantage for one fuel (natural gas) at the expense of another fuel (coal). Specific comments for these issues are detailed below.

1. EPA should adopt a standard that reflects technology that is available today without carbon capture and sequestration (CCS).

U.S. EPA's proposed rule is inconsistent with Section 111(a)(1) of the Clean Air Act. The proposed language states: "CCS technology has been adequately demonstrated, and its implementation costs are reasonable." In fact, this technology, on a commercially viable scale, has yet to be demonstrated on any operational coal-fired EGU.

In the past, U.S. EPA has based NSPS on methods that have actually been achieved in practice. If required to develop a viable NSPS for CO<sub>2</sub>, the U.S. EPA should follow its past precedent and examine the existing fleet of coal-fired power plants and select the most efficient units in terms of lbs CO<sub>2</sub>/MWh, and set the NSPS for new plants

accordingly. Not only would this approach be consistent with past practice, new EGUs would have an appropriate and achievable target that will reduce CO<sub>2</sub> in the future.

2. U.S. EPA should follow the same methodology for coal as was used for natural gas.

Emission rates of natural gas-fired combined cycle facilities that were in operation from 2006 to 2010 were reviewed to develop the proposed natural gas standard of 1,000 lbs CO<sub>2</sub>/MWh. U.S. EPA should use a similar method for coal plants. It is Ohio's opinion that consistent methods for determining a proposed standard be used, otherwise, it will be easily suggested that this proposed rule for EGU's is biased against coal and threatens to remove coal from future, potentially viable projects.

All illustration of how U.S. EPA is proposing an unlevelled playing field when setting a standard for coal is evident from U.S. EPA's selection of partial CCS as the Best System of Emission Reduction (BSER) for coal, while approving the less stringent natural gas combined cycle (NGCC) BSER for natural gas. U.S. EPA has clearly selected a "winning fuel" (natural gas) over a "losing fuel" (coal). Not only does this approach goes beyond U.S. EPA historical precedent and regulatory authority, it does not meet congressional intent. Congress did not intend for U.S. EPA to effectively ban new coal-fired power plants. In fact, 42 U.S.C. § 7411(b)(5) (Section 111(b)(5) of the Clean Air Act) forbids U.S. EPA from restricting owners and operators to installing and operating a particular technology to meet a standard of performance.

In addition to the alternative method of creating a standard for coal versus natural gas, the emissions reductions of each fuel are not comparable. The average emission rates for natural gas-fired generation are 1,135 lbs CO<sub>2</sub>/MWh.<sup>1</sup> U.S. EPA is proposing a standard performance of 1,000 lbs CO<sub>2</sub>/MWh for natural-gas fired generation. This standard calls for a 12% reduction in average CO<sub>2</sub> emissions. The average emission rates for coal-fired generation are 2,249 lbs CO<sub>2</sub>/MWh.<sup>2</sup> U.S. EPA is proposing a standard of performance of 1,100 lb CO<sub>2</sub>/MWh for coal-fired power plants. This standard calls for a 51% reduction in average CO<sub>2</sub> emissions. Obviously, U.S. EPA asks coal-fired EGUs to dramatically reduce their CO<sub>2</sub> emissions unlike the modest emissions decrease requested for natural gas-fired EGUs.

## **B. Technical Infeasibility for Coal: Standard Based on Future Plants**

U.S. EPA should not consider projects before they are permitted, operational, or even built as support for the determination that carbon capture and sequestration is a commercially available technology for the NSPS. U.S. EPA is using power plants that are not only tentative, future projects, but also projects that have received heavy funding by government entities as a basis for setting national policy in this proposed rule. U.S. EPA cannot guarantee that this level of funding will be available from the federal government for all future projects. In addition, many of the projects' costs are not representative of total costs, as the costs may, and have for many of the projects, increased as construction progresses. Many of these projects have not yet finished construction, and one has yet to receive all of the final state approvals. A NSPS using these projects departs from the longstanding, precedential U.S. EPA approach and is not

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<sup>1</sup> <http://www.epa.gov/cleanenergy/energy-and-you/affect/air-emissions.html>

<sup>2</sup> <http://www.epa.gov/cleanenergy/energy-and-you/affect/air-emissions.html>

consistent with the statement that CCS technology has been adequately demonstrated and its implementation costs are reasonable.

U.S. EPA's CCS technology examples also skews affordability because every plant uses enhanced oil recovery (EOR). EOR provides a substantial revenue stream to offset the high capital costs and operating costs of CCS. However, EOR is not available in many parts of the country. U.S. EPA should not develop a standard based on the economics relevant to only a fraction of the country. A national standard such as the NSPS must be independently, economically and technically achievable throughout the country, not just in limited areas. Any other approach is inconsistent with the Clean Air Act. Also, U.S. EPA should not use future projects that may not be in operation for years and thus only have optimistic performance projections and hopeful expenditures estimates without considering the country-wide economic and technical feasibility of these projects.

The projects being used to create a standard of performance are listed below including their estimated operational date and costs:

1. Southern Company's Kemper County Energy Facility. This project has received \$270 million from the Department of Energy (DOE) and \$133 million in investment tax credits from the Internal Revenue Service.<sup>3</sup> Unless the DOE's Clean Coal Power Initiative, the program that donated \$270 million to Southern Company, intends to help fund all future projects, the economic viability of this technology will be vastly different for future projects. In addition, this project will not be operational until for several months in the future.
2. SaskPower's Boundary Dam CCS Project. This Canadian project costs \$1.355 billion and is also receiving a heavy subsidy of \$240 million from the federal government.<sup>4</sup> Performance testing is currently scheduled, but the facility will not be fully functional until sometime in the future. SaskPower claims to be leading the way in developing CCS technology.<sup>5</sup> Standards should not be based on developing technologies that are not commercially tested.
3. Summit Power's Texas Clean Energy Project (TCEP). This project's estimated total cost is \$1.727 billion. This project is heavily subsidized, with the DOE share being \$450 million (26%).<sup>6</sup> The DOE awarded \$350 million in December 2009 for an eight-year joint project with University of Texas Bureau of Economic Geology. TCEP received an additional \$100 million from the American Recovery and Reinvestment Act (ARRA) in August 2010. TCEP received the \$450 million award in 2010 from the DOE's Clean Coal Power Initiative (CCPI). The project has not commenced construction and is years past the original projected 2011 date. The project also lost its major electricity customer due to the high electric costs. Consequently, the entire project is in jeopardy. This example shows that even with government subsidies and enhanced oil recovery, this standard is not feasible.

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<sup>3</sup> <http://sequestration.mit.edu/tools/projects/kemper.html>.

<sup>4</sup> [http://sequestration.mit.edu/tools/projects/boundary\\_dam.html](http://sequestration.mit.edu/tools/projects/boundary_dam.html).

<sup>5</sup> <http://www.saskpower.com/our-power-future/work-currently-underway/>.

<sup>6</sup> <http://sequestration.mit.edu/tools/projects/tcep.html>.

4. Hydrogen Energy California Project (HECA). This project will cost \$4.028 billion.<sup>7</sup> This project is heavily subsidized. It was awarded a \$408 million grant by the DOE under Clean Coal Power Initiative Round 3. The project has not yet broken ground, started construction, received final state approval or even negotiated an agreement for the purchase of power. Without the necessary approvals this plant may not even be built. The project, if built, may be operational in 2017 with a more realistic date in 2018 or 2019. The basis for the NSPS should be more concrete than a speculative plant that may be constructed sometime in the future.

### **C. Infeasibility of Carbon Capture and Sequestration (CCS) Technology**

Ohio EPA believes that carbon capture and sequestration, which holds possible promise sometime in the future, is not a commercially available control technology. The study on which U.S. EPA relies focuses on a range of CO<sub>2</sub> capture levels for *new* supercritical pulverized coal (SCPC) and integrated gasification combined cycle (IGCC) power plants.<sup>8</sup> This study shows high costs for carbon capture and sequestration technology even on the smallest scale. While components of carbon capture and sequestration are currently in use, all the technological components do not currently function together on a commercial scale.<sup>9</sup> In order to be considered commercial, carbon capture and sequestration technology needs to be cost effective without government subsidies and not reliant upon enhanced oil recovery to subsidize the operation of carbon capture and sequestration. Further, carbon capture and sequestration may not be a viable technology due to water constraints or the lack of sufficient geological structure to accept carbon capture and sequestration underground injection technology.

### **D. Feasibility of Existing Reduction Technology as NSPS**

The Ohio EPA believes that the standard should be based on the performance of existing highly efficient generation technology that does not include carbon capture and sequestration, such as supercritical pulverized coal (SCPC), circulating fluidized bed (CFB) boiler, or a modern, efficient integrated gasification combined cycle (IGCC) unit. U.S. EPA has acknowledged that these options are technically feasible but has stated that the reductions of emissions are not adequate to reach its arbitrary goal. The NSPS is a technology-based standard, not an air quality standard driven program. U.S. EPA should not use the NSPS in an attempt to reach some predetermined reduction standard or issue standards that support only certain industries or technologies. Ohio EPA believes that reduction levels using current technology are not only adequate, but necessary in order to ensure that U.S. EPA develops a standard that is consistent with the approach used to develop the natural gas NSPS.

U.S. EPA estimates that a new SCPC unit firing coal would emit 1,700 lbs CO<sub>2</sub>/MWh and a new IGCC unit would emit 1,450 lbs CO<sub>2</sub>/MWh; compared to the average emissions from coal-fired power plants discussed above. These are 25% and 36% emissions reductions, respectively. CFB boilers have also been shown to reduce emissions by at least 20%.<sup>10</sup> These reductions are more than twice the reductions proposed for natural gas plants. These

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<sup>7</sup> <http://sequestration.mit.edu/tools/projects/heca.html>.

<sup>8</sup> <http://www.netl.doe.gov/energy-analyses/pubs/Gerdes-08022011.pdf>.

<sup>9</sup> Howard J. Herzog, *Scaling Up Carbon Dioxide Capture and Storage: From Megatons to Gigatons*, Energy. Econ. 2011 33, 597-604.

<sup>10</sup> H. Arro, A. Prikk, T. Pihu, *Calculation of CO<sub>2</sub> Emissions From CFB Boilers of Oil Shale Power Plants*, Oil Shale, Vol. 23, No. 4, 356-365 (2006).

technologies are not only proven with existing performance, but also provide real emissions reductions. IGCC plants in operation include the 262 MW Wabash River Plant, the 250 MW Tampa Electric Coke Power Station, and the 618 MW Duke Energy Edwardsport plant. New supercritical plants that have been come on line include the We Energies Elm Road Generating Station, Xcel Energy Comanche Generating Station Unit 3, and Luminant's Oak Grove Plant. Fluidized bed power plants are being constructed and operated in a number of countries throughout the world.

Ohio EPA believes that a modern, efficient IGCC unit should be the BSER for coal. IGCC units are currently in operation and can provide reliable performance data. In addition, total costs for IGCC units are easier to analyze, as existing units have calculated total costs, while the CCS projects only have optimistic cost estimates. Emissions reductions with an IGCC unit are still aggressive enough to meet the U.S. EPA's overall goal of reducing carbon emissions, while still allowing for new plants to be technically and economically feasible. In addition, using IGCC technology as a base for creating a NSPS will follow the agency's prior precedent of creating standards based on the performance of existing technology.

## **E. Other Considerations**

### **1. Cost of Natural Gas**

Presently, natural gas prices are near historic lows, and much of the NSPS is based on the presumed continuation of these low costs into the future. Historically, the fuel commodities market, including natural gas, has been extremely volatile and sensitive to not only domestic influences but also to international demand and other external factors that cannot be easily forecast or controlled. The cost of the natural gas is extremely sensitive to short-term phenomena. For example, in the near future, many currently economically viable coal-fired units will be retired as a direct result of the CSAPR and MATS rules. Ohio alone has twenty-seven emitting units that are scheduled for retirement on or before 2015. At least some portion of the generating capacity of these units will need to be replaced by NGCC units, and demand for natural gas will increase rapidly in a very short time period as these new units go online. Likely, the costs of natural gas will increase with increased demand. Thus, Ohio EPA believes that the presently low cost of natural gas is being driven by short-term factors that will not be sustained over the long term and that significant and far reaching rules, such as the proposed NSPS, should not be based on predicted future costs of any commodity, especially those of fuels which have historically volatile markets.

### **2. Eight Year Review Option**

U.S. EPA is mandated to review NSPS every eight years under 42 U.S.C. § 7411(b)(1)(b) (Section 111(b)(1)(B) of the Clean Air Act). If U.S. EPA uses the technology for existing coal-fired power plants to set an NSPS in this proposed rule, U.S. EPA would have the ability to review and update the standard in eight years, if appropriate, which would also include a review of actual operational data from the plants with carbon capture and sequestration. This logical, step-wise approach, will allow the technology to advance, rather than practically eliminating the use of coal in new plants by adopting a standard based on speculative cost projections.

### 3. Supplemental Information

In further support of the proposed NSPS, U.S. EPA issued a supplemental document to provide additional technical support for the NSPS. The supplemental information identified additional examples of the application of carbon dioxide capture at non-EGU sources. Unfortunately, these examples do not represent the source category for which U.S. EPA has proposed the standard, and fail to have any practical relevance to coal-fired EGUs.

### 4. U.S. EPA's Proposal Adds Huge Energy Inefficiencies to Power Production

For decades, U.S. EPA has been promoting the benefits of energy efficiency. U.S. EPA has established multiple programs to require and promote energy efficiency such as Energy Star. The federal government provides tax credits for certain energy efficiency products. With that background, it is inconsistent and wasteful for U.S. EPA to mandate a specific technology that consumes an enormous power load in order to operate. Carbon capture and sequestration is estimated to consume approximately 30% of the energy output of the plant.<sup>11</sup> This high parasitic load means that for every one ton of coal burned in a conventional plant about 1.30 tons of coal must be burned in a carbon capture and sequestration plant. This tremendous energy penalty means that 30% more coal must be mined, transported, and burned to reach the same electrical output design as a conventional plant. If U.S. EPA examines the total impact of carbon capture and sequestration, the benefits of this technology in its current form are tenuous. The additional burning of coal needed to support CCS will also increase the amount of traditional pollutants coming from these plants along with greater emissions of hazardous air pollutants. U.S. EPA should also consider the impact of the additional excess emissions that will result from the deployment of CCS.

## F. Fee Issues

### 1. Departure from Title V fee applicability for CO<sub>2</sub> as a regulated pollutant

The proposed activity-based funding approach to support a permitting authority's greenhouse gas (GHG) regulatory activities departs from the current precedent established in 40 C.F.R. § 70.9, presumptive funding of Title V activities. The fees implemented for CO<sub>2</sub> for sources subject to 40 CFR Part 70 should be based on the same criteria and approach used by U.S. EPA to establish the original \$25/ton presumptive minimum fee for other existing Title V pollutants. The presumptive minimum fee approach is consistent and provides a baseline nationwide for funding Title V program implementation activities.

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<sup>11</sup> Carbon Management Technology Conference, February 2012, Paper No. CMTC-151635-PP, U.S. DOE National Energy Technology Laboratory's Post Combustion Carbon Capture R&D Program, Lynn Drake H, Jared Ciferno, Ron Munson, Jim Murphy, U.S. DOE National Energy Technology Laboratory

U.S. EPA established a nationwide \$25/ton presumptive minimum fee for each "Regulated Pollutant" pursuant to authority established in Title V of the 1990 Clean Air Act Amendments. "The total amount of fees collected by the permitting authority shall conform to the following requirements: The Administrator shall not approve a program as meeting the requirements of this paragraph unless the State demonstrates that, except as otherwise provided in subparagraphs [2] (ii) through (v) of this subparagraph, the program will result in the collection, in the aggregate, from all sources subject to subparagraph (A), of an amount not less than \$25 per ton of each regulated pollutant, **or such other amount as the Administrator may determine adequately reflects the reasonable costs of the permit program.**" 42 U.S.C. 7661a(b)(3)(i) (emphasis added).

Ohio EPA submits that the proposed approach for adding activity-based fees departs from the Clean Air Act requirement that the fee be based on a \$/ton emitted from the subject sources. Introducing a permitting agency activity-based fee for one "carved-out" regulated pollutant, not only introduces lack of uniformity in the fee burden across approved presumptive minimum fee programs, it introduces costly and complex administrative burdens in implementing such an approach. In short, the fee structure for CO<sub>2</sub> should be the same as the fee structure for the other pollutants that fund Title V program implementation activities. The \$/ton of CO<sub>2</sub> should be adjusted to establish proportional equivalency to the other pollutants due to the significantly larger CO<sub>2</sub> emissions levels.

## 2. Advantages of implementing a prorated \$/ton fee for CO<sub>2</sub> based on reported emissions

Ohio EPA believes that a significantly reduced, prorated, federal presumptive minimum fee would be consistent with the U.S. EPA's authority to establish a fee that "...adequately reflects the reasonable costs of the permit program." A prorated fee per ton should be developed for CO<sub>2</sub> using the same mechanism as the current \$25/ton presumptive minimum fee per pollutant and take into consideration the cap in place, which limits billing greater than 4,000 tons of actual reported emissions. This similar \$/ton approach would also lend itself to more cost effective and efficient implementation by state and tribal Title V programs.

Prorating a CO<sub>2</sub> presumptive minimum fee could easily be implemented within the existing \$/ton reporting and invoicing architecture. Introducing a different architecture to accommodate one pollutant as presented in this proposed rulemaking would be costly and complicated because the basis is completely foreign to the existing fee structure. In Ohio that would include significant modifications to software and supporting databases as well as related training of the regulated community and internal staff. Alternately, tailoring a CO<sub>2</sub> "fee per ton emitted" would be more consistent with tailoring applicability of GHGs to the Title V program and would result in minimal disruption or need for adjustment to existing state and tribal fee processing programs. Finally, adding an additional billable pollutant to Ohio's enabling legislation will be challenging. Introducing both a new pollutant and an additional fee structure will be much more difficult for approval.

In summary, adding a prorated, tailored presumptive minimum fee for CO<sub>2</sub> under the existing \$25/ton consumer price index adjusted fee structure minimizes complexity,

ensures nationwide uniform application and supports timely implementation of funding activities associated with implementing greenhouse gas regulations for Title V facilities.

### G. Summary

U.S. EPA's proposed NSPS for CO<sub>2</sub> for coal and natural gas power plants suffers from serious technical defects. The proposed rule, if adopted, will eliminate the potential for new coal-fired power plants due to the high overall cost of carbon capture and sequestration. This NSPS relies on tentative, future projects to set a standard instead of using actual data from existing plants to ensure the promulgated standard is achievable. The proposal also treats natural gas and coal inequitably, requiring a degree of control on coal plants that has not yet been achieved in practice. In contrast, the natural gas plants are able to meet the proposed standard for CO<sub>2</sub> by building a well-designed plant with technologies presently achievable unlike carbon capture and sequestration. Finally, U.S. EPA should not utilize the NSPS in a manner to reach a predetermined reduction of CO<sub>2</sub>, but instead recognize existing operating technology to set the NSPS standard for coal-fired EGUs.

In order to correct the significant shortcomings of the rule, Ohio EPA believes it is necessary to re-propose a new rule that provides a level playing regulatory field for multiple energy sources to be designed, built, and operated in the U.S. and Ohio to meet our current and expected future energy demands in a cost effective and environmentally responsible manner.

Thank you for the opportunity to comment.

Sincerely,

A handwritten signature in black ink, appearing to read "Craig W. Butler". The signature is fluid and cursive, with a large initial "C" and a distinct "B".

Craig W. Butler  
Director