New Source Performance Standards for Fossil Fuel Fired Power Plants

On April 13, 2012 a proposed rule establishing new source performance standards for emissions of carbon dioxide (“CO₂”) for new fossil fuel-fired electric utility generating units (“EGUs”) was published in the Federal Register. The Environmental Protection Agency (“EPA” or the “Agency”) is proposing this rule because CO₂ is a greenhouse gas (“GHG”) that endangers both the public health and the public welfare of current and future generations, and that fossil fuel-fired EGUs are responsible for approximately 40 percent of all anthropogenic CO₂ emissions in the United States. The proposed requirements, which are limited to new sources, would require new fossil fuel-fired EGUs with a base load rating of more than 73 megawatts (“MW”) heat input of fossil fuel to limit emissions to 1,000 pounds of CO₂ per megawatt-hour on an average annual basis based on the performance of natural gas combined cycle technology.

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[3] Electric utility generating unit or EGU means any steam electric generating unit or stationary combustion turbine that is constructed for the purpose of supplying more than one-third of its potential electric output capacity and more than 25 MW net-electrical output to any utility power distribution system for sale. Also, any steam supplied to a steam distribution system for the purpose of providing steam to a steam-electric generator that would produce electrical energy for sale is considered in determining the electrical energy output capacity of the affected EGU.
Because of the economics of the energy sector, the EPA and others project that NGCC will be the predominant choice for new fossil fuel-fired generation even absent this rule.\[^4\] The EPA does not project any new coal-fired EGUs without carbon capture and storage (“CCS”) to be built in the absence of this proposal through 2030. Nevertheless, new coal-fired units could meet the standard either by employing CCS of approximately 50 percent of the CO\(_2\) in the exhaust gas at startup, or through later application of more effective CCS to meet the standard on average over a 30-year period.\[^5\] The proposed rule does not contain standards of performance for existing EGUs whose CO\(_2\) emissions increase as a result of installation of pollution controls for conventional pollutants, or for proposed EGUs, referred to here as transitional sources, that have acquired a complete preconstruction permit by the time the notice of proposed rulemaking (“NOPR”) appears in the \textit{Federal Register} and that commence construction within 12 months. Accordingly, those sources would not be subject to the standards of performance contained in the proposed rule.

\section{I. Background}

Following EPA’s amendments to the new source performance standards for EGUs in 2006, several states and environmental groups challenged the Agency’s decision not to include standards of performance for GHC emissions within those amendments. The United States Supreme Court’s 2007 ruling that the definition of air pollutant under the Clean Air Act included GHGs led the EPA to determine whether it should regulate GHC emissions from sources in each category as provided under Section 111 of the Clean Air Act.\[^6\] The EPA eventually issued its “Endangerment Finding” in 2009, declaring that GHCs in the atmosphere may reasonably be anticipated to endanger public health and welfare.\[^7\] This, in turn, supported future agency actions concerning GHG emissions.\[^8\] The EPA initially entered into a proposed settlement

\[^4\] Fossil fuel means natural gas, petroleum, coal, and any form of solid, liquid, or gaseous fuel derived from such material for the purpose of creating useful heat.

\[^5\] Carbon capture and storage (CCS) means a process that includes capture and compression of CO\(_2\) produced by an electric utility generating unit before release to the atmosphere; transport of the captured CO\(_2\) (usually in pipelines); and storage of that CO\(_2\) in geologic formations, such as deep saline formations, oil and gas reservoirs, and unmineable coal seams.


\[^8\] For instance, on May 7, 2010, EPA (acting with the Department of Transportation’s National Highway Traffic Safety Administration) published a joint final rule that will reduce greenhouse-gas emissions from light-duty vehicles. Promulgation of the final light-duty-vehicle standards means that, as of January 2,
with the states and environmental petitioners in December of 2010, agreeing to issue a proposed rule proposing standards of performance for GHGs for new and modified EGU's, as well as for existing sources under Section 111(d) of the Clean Air Act. After numerous delays, the proposed rule was issued on March 27 and published in the federal register on April 13, 2012.

2011, the EPA will consider greenhouse gases to be pollutants subject to regulation under the CAA and accordingly subject to Sections 165 and 169(1) of the CAA. See 75 Fed. Reg. at 31,549-31,551. Those provisions - applying to stationary sources - require any new or modified “major emitting facility” to obtain a so-called “PSD permit,” under the provisions of the CAA designed to prevent significant deterioration of air quality. The CAA applies PSD requirements to a “major emitting facility,” which is defined to include any “source with the potential to emit” at least 250 tons per year of “any air pollutants,” as well as certain “stationary sources of air pollutants” (including, as most relevant here, fossil-fuel-fired EGU's and boilers), if they emit or have the potential to emit at least 100 tons per year. EPA’s regulations implement those requirements by applying them to “major stationary source[s],” 40 C.F.R. 52.21(a)(2), which are defined to include stationary sources that emit at least 100 or 250 tons per year of a “regulated NSR pollutant,” 40 C.F.R. 2.21(b)(2)(i), which includes “[a]ny pollutant subject to regulation under the [CAA].” 40 C.F.R. 52.21(b)(50)(iv).

In order to obtain such a permit, a facility must, among other things, be subject to the best available control technology for each pollutant subject to regulation under the CAA. Likewise, the promulgation of the light-duty-vehicle standards means that EPA, for the first time, will consider greenhouse gases to be subject to the permitting requirements under Title V of the CAA. The Title V permitting process “requires that certain air pollution sources, including every major stationary source of air pollution, each obtain a single, comprehensive operating permit to assure compliance with all emission limitations and other substantive CAA requirements that apply to the source.” See 42 U.S.C. 7661a(a), 7661(2)(B), 7602(j); 75 Fed. Reg. 31,551-31,554 (describing EPA’s interpretation of the applicability of Title V); Environmental Integrity Project v. EPA, 425 F.3d 992, 993 (2005); see also Virginia v. Browner, 80 F.3d 869, 873 (4th Cir. 1996) (describing Title V permit as “a source-specific bible for [CAA] compliance”), cert. denied, 519 U.S. 1090 (1997).

On June 3, 2010, the EPA issued a final rule that tailors application of the PSD and Title V permitting requirements. That rule limits the scope and effective date of those requirements by providing an incremental phase-in process, applying in January 2011 to sources already obtaining permits for other pollutants, and later to additional sources. Pursuant to the first step of the tailoring rule, sources are subject to the PSD requirements on account of their carbon-dioxide emissions as of January 2, 2011, only if (1) they are already subject to such requirements due to emissions of non-greenhouse-gas air pollutants, and (2) they undertake a modification that will increase their carbon-dioxide missions by at least 75,000 tons per year while also significantly increasing emissions of non-greenhouse-gas pollutants. 75 Fed. Reg. at 31,516. The second step of the rule, beginning on July 1, 2011, “will phase in additional large sources of [greenhouse-gas] emissions.” Similar steps apply in the case of Title V. Id. at 31,523-31,524. The third step, beginning in July 2013, may phase in regulation of additional sources. Ibid. EPA also stated that no sources or modifications below a certain size (50,000 tons of carbon dioxide per year) would be made subject to PSD or Title V permitting requirements before April 30, 2016.
A. The Clean Air Act

Section 111 of the Clean Air Act ("CAA") authorizes the EPA to promulgate new source performance standards ("NSPSs"), which typically apply to new and modified existing stationary sources.\[^{[9]}\] Specifically, Section 111(b) requires the agency to develop performance standards for any source which the EPA Administrator finds "causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare." These performance standards must include the best system of emission reduction that, considering the cost of achieving such reduction and any non-air quality health and environmental impact and energy requirements, the Administrator determines has been adequately demonstrated. The EPA has promulgated NSPS for EGUs covering a number of pollutants.\[^{[10]}\]

Under the CAA, the EPA has historically proposed emission limits by source category or subcategory. In the electric power industry, for instance, the EPA has examined the best performing, or group of performing, coal-fired power plants and has based the limits for all coal-fired power plants on that standard of performance. Instead of adopting such fuel-based standards that would impose different performance standards for different fuels, through its proposed rule the EPA has combined fossil-fueled power plants into one category and has set a limit for all fuel types based on the performance of one fuel type, natural gas, and the technology using that fuel, combined cycle power plants. Thus, "all new fossil fuel-fired electricity generating units that meet specified minimum criteria will be subject to the same requirements, and therefore will be treated alike because they serve the same function, that is to serve baseload or intermediate demand."

II. The Proposed Rule

The proposed rule applies only to future power plants, specifically new fossil fuel fired EGUs with a base load rating of more than 73 megawatts that supply more than one-third of their potential annual electric output to any utility power distribution system for sale. EPA describes this as including the following fossil-fuel-fired EGUs: (1) electric utility steam generating units also known as “boilers”, (2) integrated gasification combined cycle units, and (3) stationary combined cycle turbines. The proposed rule does not apply to the following: (1) existing EGUs, including those making modifications, (2) transitional sources, which are defined as proposed EGUs that have completed the preconstruction permitting process by the date the proposed

\[^{[9]}\] 42 U.S.C. ss. 7401 to 7671q.

\[^{[10]}\] Codified at 40 C.F.R Part 60.
rule is published in the *Federal Register* and that commence construction within one year from such date, (3) new EGUs located in non-continental areas such as Hawaii and US territories, (4) new simple cycle EGUs\[11\], and (5) new EGUs that do not burn fossil fuels.\[12\] Additionally, biomass-only facilities and biomass-fired boilers that co-fire with less than 250 million British thermal units per hour of any fossil fuel would not be subject to the proposed rule.

The EPA’s proposed rule would require such new EGUs to meet a “standard of performance” of no more than 1,000 pounds of CO$_2$ emitted per megawatt-hour on a 12 month annual average basis.\[13\] The standard is based solely on the degree of emission limitation achievable through natural gas combined-cycle (“NGCC”) technology, which the Agency claims is widely used throughout the United States and is defined by the EPA as the “best system of emission reduction” (“BSER”). The agency surmises that NGCC plants will be the “facilities of choice” for the foreseeable future.\[14\] It also projects that new natural gas combined cycle power plants should be able to meet the proposed standard without add-on controls, and further estimates that 95 percent of the natural gas combined cycle power plants built since 2005 would also be able to meet the standard without add-on controls. Thus, the EPA believes that the proposed rule will not result in significant compliance costs, since even without its adoption the electric power industry would build natural gas-fired EGUs already meeting with the proposed standard. This is because of the increasing availability and lower price of natural gas as compared to coal, and the impact of emissions controls required by other EPA rules affecting the

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\[11\] The EPA has not included simple-cycle power plants because simple-cycle units, which do not capture waste heat to generate more power or useful thermal energy, typically operate only as “peaking” plants and it would therefore be more expensive to reduce their emissions as opposed to combined-cycle power plants, which typically operate at intermediate to baseload units.

\[12\] EPA believes that there are approximately 15 units that would be classified as transitional sources.

\[13\] Integrated gasification combined cycle electric utility generating unit means an electric utility combined cycle gas turbine that is designed to burn fuels containing 50 percent (by heat input) or more solid-derived fuel not meeting the definition of natural gas. The Administrator may waive the 50 percent solid-derived fuel requirement during periods of the gasification system construction or repair. No solid fuel is directly burned in the unit during operation.

\[14\] According to the EPA, because natural gas generation is cleaner and cheaper than coal, natural gas-fired EGUs qualify as 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 and energy requirements) the Administrator determines has been adequately demonstrated.” Combined cycle means a stationary turbine combustion system where heat from the turbine exhaust gases is recovered by a heat recovery steam generating unit.
power sector. In fact, the EPA believes that no new coal-fired units would be constructed prior to 2020 and none without CCS prior to 2030. And, while CCS would add considerably to the costs of a new coal-fired power plant, the difference should decrease over time as CCS becomes more mature and less expensive.

The Agency recognized that in a few instances, owners or operators may actually seek to build coal- or pet coke-fired EGUs. If constructed, new EGUs fired by coal or petroleum coke would have the choice of an alternative compliance standard designed to take into account the time needed to ensure that their CCS equipment is installed and fully operational. These EGUs would have a 30-year compliance period based on the following schedule: For each of the first ten years of operation, the EGU must not discharge any gases that contain in excess of 1,800 pounds per megawatt hour gross output on a 12 month annual average basis. Beginning with the eleventh year of operation, the EGU must have a functioning CCS system in place and the EGU must not discharge any gases that contain CO\textsubscript{2} in excess of 600 pounds of CO\textsubscript{2} per megawatt hour gross output on a 12 month annual average basis, meaning the total average annual emissions over the 30-year period must not exceed 1,000 pounds of CO\textsubscript{2} per megawatt hour. The EPA adopted the 1,800 pounds of CO\textsubscript{2} per megawatt hour standard available to coal-fired EGUs during their first ten years of operation because modern supercritical and ultra-supercritical coal-fired boilers – the technology required to reach this result - is currently deployed in Europe and is now being widely deployed in Asia (especially China), and it offers more efficient operation than the subcritical boilers that have more often been constructed in the U.S. These supercritical and ultra-supercritical boilers have CO\textsubscript{2} emissions of approximately 1,800 pounds per megawatt hour and provide the lowest overall costs for conventional coal-based electricity.

A. Comments on the Proposed Rule

Comments must be received on or before June 12, 2012. The EPA will specifically consider comments on the following issues:

- Where the standard should fall within a range of 950 pounds of CO\textsubscript{2} per megawatt hour to 1,100 pounds of CO\textsubscript{2} per megawatt hour;
- The use of net generation as an emission rate measurement instead of gross generation;
- “[R]easonable variations” on the 10-year/20-year proposed averaging times, including a 50-year averaging time;
- Practical difficulties in compliance and enforcement of the 1,000 pounds of CO\textsubscript{2} per megawatt hour standard;
- Methods for establishing practicably enforceable short term emission limits;
- Options for increasing emission standards for early adopters of CCS or allowing coal- and pet coke-fired EGUs to operate without CCS for the first
ten years until improvements in the technology lowered costs and reduced performance issues;

- The use of CO₂ continuous emission monitors for enforcement purposes and the method of stack testing to be used in demonstrating compliance;
- The need to collect additional data on nitrogen dioxide and methane emissions from fossil fuel-fired EGUs; and
- The types of CO₂ control measures that should be required of modified or reconstructed EGUs for the purpose of drafting future standards.

The EPA will also hold public hearings on the proposed rule. The dates, times and locations of those hearings will be announced at a later date.

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The proposed rule, “Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units,” is available at: https://federalregister.gov/a/2012-7820

This Committee Update provides general information and not legal advice or opinions on specific facts


2 Or 32.4 percent of all anthropogenic GHG emissions; from information in Table 2-1 from ‘Inventory of U. S. Greenhouse Gas Emissions and Sinks: 1990 – 2009’, U. S. Environmental Protection Agency, EPA 430-R-11-005, April 2011.

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5 Carbon capture and storage (CCS) means a process that includes capture and compression of CO₂ produced by an electric utility generating unit before release to
the atmosphere; transport of the captured CO2 (usually in pipelines); and storage of that CO2 in geologic formations, such as deep saline formations, oil and gas reservoirs, and unmineable coal seams.


8 For instance, on May 7, 2010, EPA (acting with the Department of Transportation’s National Highway Traffic Safety Administration) published a joint final rule that will reduce greenhouse-gas emissions from light-duty vehicles. Promulgation of the final light-duty-vehicle standards means that, as of January 2, 2011, the EPA will consider greenhouse gases to be pollutants subject to regulation under the CAA and accordingly subject to Sections 165 and 169(1) of the CAA. See 75 Fed. Reg. at 31,549-31,551. Those provisions - applying to stationary sources - require any new or modified “major emitting facility” to obtain a so-called “PSD permit,” under the provisions of the CAA designed to prevent significant deterioration of air quality. The CAA applies PSD requirements to a “major emitting facility,” which is defined to include any “source with the potential to emit” at least 250 tons per year of “any air pollutants,” as well as certain “stationary sources of air pollutants” (including, as most relevant here, fossil-fuel-fired EGUs and boilers), if they emit or have the potential to emit at least 100 tons per year. EPA’s regulations implement those requirements by applying them to “major stationary source[s],” 40 C.F.R. 52.21(a)(2), which are defined to include stationary sources that emit at least 100 or 250 tons per year of a “regulated NSR pollutant,” 40 C.F.R. 2.21(b)(2)(i), which includes “[a]ny pollutant subject to regulation under the [CAA].” 40 C.F.R. 52.21(b)(50)(iv).

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a heat recovery steam generating unit.