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EPA's Ambitious Proposed GHG Emissions Standards May Face Challenges



The U.S. Environmental Protection Agency (EPA or Agency) issued a [proposed rule](#) (Proposed Rule) on May 11, 2023, that would adopt new greenhouse gas (GHG) emissions standards for certain coal and natural gas-fired power plants. The Proposed Rule was published in the *Federal Register* on May 23, 2023. [\[1\]](#)

The Proposed Rule is EPA's latest effort to decarbonize the electric energy sector. Learning from the U.S. Supreme Court's rejection of the Clean Power Plan, EPA is proposing standards for certain coal- and gas-fired electric generating units (EGUs). These standards rely upon technologies like carbon capture and sequestration/storage (CCS) or low-GHG-emitting hydrogen fuels as the "best system of emission reduction" (BSER) for GHGs. The Proposed Rule aims to drive down GHGs in the electric generation sector significantly by requiring certain new and existing fossil fuel generation to reduce emissions based on the use of CCS by 2035 or co-firing with hydrogen by 2032.

Questions remain, however, whether this approach will fare any better than the Clean Power Plan. The Inflation Reduction Act (IRA) is incentivizing the development of CCS and hydrogen technologies through massive federal funding, but these technologies do not yet have a strong track record in the United States. Critics will likely allege that EPA's selection of CCS, for example, fails to meet the threshold definition of a "standard of performance" under the Clean Air Act (CAA). Moreover, many affected EGUs may retire rather than invest in capital-intensive CCS infrastructure or overhaul plants to use hydrogen fuel. This, in turn, may prompt stakeholders to raise concerns regarding grid reliability: the retirement of coal- and gas-fired EGUs could increase when there is a need for additional investment in electric transmission and a growing interconnection queue backlog in many markets.

Overview of Proposed Rule

EPA proposes to regulate GHG emissions from new and existing EGUs by establishing new source performance standards (NSPS) under Section 111 of the CAA. For specific source categories, including EGUs, EPA must promulgate "standards of performance" for emissions of air pollutants from new sources (including modified and reconstructed sources). Existing sources also must be regulated for the same pollutant (if not otherwise controlled by the CAA) through individual state plans consistent with EPA's performance standards.[\[2\]](#)

To issue a rule under the NSPS program, EPA must make technology-based findings to establish a "standard of performance" and determine achievable emission limits based on its findings.

A "standard of performance" is required to "reflect the degree of emission limitation achievable through the application of the best system of emission reduction (BSER) 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."[\[3\]](#)

The Proposed Rule's standards reflect BSER determinations based on select technologies, including carbon capture and CCS, low-GHG hydrogen co-firing, and natural gas co-firing that can be applied directly to power plants. The proposed standards vary based on whether an EGU is new or existing, coal-fired or gas-fired, and the frequency of its use, as shown in the following table.

EGU Type	BSER Component 1 (Starting at Effective Date)	BSER Component 2 (Starting 2032)	BSER Component 3 (Starting 2038)
New and Reconstructed Combustion Turbines, Base Load	"Highly efficient generation" based on the performance of highly efficient turbines	30% (by volume) low-GHG hydrogen co-firing 90% CO2 capture by 2035	96% low-GHG hydrogen co-firing
New and Reconstructed Combustion Turbines, Intermediate Load	Highly efficient generation	30% low-GHG hydrogen co-firing	Taking comment on whether to apply a higher percentage low-GHG hydrogen co-firing requirement
New and Reconstructed Combustion Turbines, Low Load	Use lower GHG-emitting fuels		
Existing Combustion Turbines, 300 megawatts (MW) >50% Capacity Factor		30% low-GHG hydrogen co-firing 90% CO2 capture by 2035	96% low-GHG hydrogen co-firing
Existing Combustion Turbines, 300 MW 20-50% Capacity Factor		30% low-GHG hydrogen co-firing	
Existing Combustion Turbines, 300 MW <20% Capacity Factor		Most efficient design	

EPA is taking comments on both the thresholds for applicability as well as the proposed BSER options themselves. Recognizing the lead time necessary to plan, permit, and construct the proposed BSER, the Proposed Rule provides an extended timeline for compliance,[\[4\]](#) but EPA is also taking comment on whether those deadlines should be accelerated. In addition, EPA is considering whether other BSER (such as heat rate improvements) should be considered for high-capacity factor combined cycle gas units with a capacity of less than 300 MW.

Separately, for existing coal-fired combustion turbines that plan to operate in the long term, EPA is proposing standards based on CCS with 90% capture of CO₂. Coal-fired units electing to permanently cease operations by various dates would have less onerous emission reduction commitments and no obligation to meet standards based on CCS.[\[5\]](#)

The Proposed Rule also includes EPA's proposed action to repeal the Affordable Clean Energy (ACE) Rule, which the Trump administration originally promulgated to regulate CO₂ emissions from existing coal-fired power plants. EPA specifically takes issue with the ACE Rule's rejection of CCS and natural gas co-firing as suitable technology standards for coal-fired EGUs.[\[6\]](#)

A detailed [Regulatory Impact Analysis](#) (RIA) accompanies the Proposed Rule, providing more information on the Agency's economic and benefits analyses, as well as environmental justice impacts.

Expect Stakeholder Criticism and Legal Challenge(s)

The Biden administration hopes to succeed in promulgating aggressive GHG emission standards for power plants where the Obama administration failed.

Last year, the Supreme Court held that the Obama-era Clean Power Plan went too far by establishing a GHG emission cap premised on the nation's systemwide shift to renewable electric generation. Specifically, the Court found that Congress had failed to provide the Agency with clear authorization to "force a nationwide transition away from the use of coal to generate electricity." *West Virginia v. EPA*, 142 S. Ct. 2587, 2616 (2022).

The current proposal clearly reflects EPA's desire to avoid another judicial admonition based on statutory overreach. The Proposed Rule again relies on EPA's authority to establish a NSPS under Section 111 of the CAA, but unlike the Clean Power Plan, it does so by establishing technology-based standards that would regulate emission units located onsite at power plants.

EPA's efforts to inoculate the Proposed Rule from judicial scrutiny do not mean that the Biden administration's GHG reduction goals are modest. EPA projects the Proposed Rule would cut 617 million metric tons of CO₂ from the nation's electric sector through 2042.[\[7\]](#) If finalized, the Proposed Rule is poised to overhaul the nation's power plants, spurring either investment in cleaner technology or power plant retirements, or some combination of the two.

Despite the Agency's efforts to buttress the Proposed Rule, it will face intense scrutiny and almost certainly multiple judicial challenges. The strongest critique likely will allege that EPA's selection of CCS fails to meet the threshold definition of a "standard of performance" under the CAA.

EPA's designation of CCS as BSER is particularly controversial because the technology arguably remains in a developmental stage. While there are a handful of EGUs with pilot CCS infrastructure in operation,^[8] there currently is only one commercially operable CCS-enabled facility in the United States, and it has been plagued by operational issues.^[9] CCS performance thus far has also raised concerns about high parasitic loads, as CCS equipment consumes a significant amount of energy from the EGU, which reduces the EGU's overall generating efficiency and performance.^[10] Industry will likely argue that EPA's selection of CCS is speculative and not "adequately demonstrated." While funding through the IRA is intended in part to promote further research and development of CCS technologies, the lead time provided in the Proposed Rule will be interpreted by some as a concession that, in fact, CCS is not sufficiently demonstrated. Expect EPA to counter that it retains the discretion to determine that a technology to be "adequately demonstrated" even if it is new and not yet in widespread commercial use.^[11]

Industry also will argue that CCS has not shown to be cost-effective, alleging that an analysis grounded in aspirational cost reductions fails to meet the definition of "standard of performance." EPA's BSER determination for CCS relies, in part, on the *anticipated* benefits of the IRA. The Agency expects use of the Section 45Q credit for CCS (\$85/metric ton) to "accelerate the pace of innovation and deployment" of the technology.^[12] EPA maintains that "it is reasonable to take the tax credit into account because it reduces the cost of the controls to the source, which has a significant effect on the actual cost of installing and operating CCS."^[13]

Industry will not be the only stakeholder criticizing the Proposed Rule. With regard to environmental justice, EPA states, "It is not practicable to assess whether the GHG impacts associated with this action are likely to result in a change in disproportionate and adverse effects" on minority and low-income populations.^[14] Environmental justice advocates likely will consider this analysis deficient and press the Agency to further consider impacts of technologies like CCS.

Proposed Rule May Increase Concerns Over Grid Reliability

The Proposed Rule may encourage the retirement of many currently operating thermal resources to which the proposed new requirements will apply (i.e., coal- and natural gas-fired EGUs). Thus, stakeholders are likely to raise concerns that the Proposed Rule could affect grid reliability as the United States transitions from primarily fossil-fired EGUs to a more diverse, low-carbon resource mix, including intermittent renewable generation, virtual power plants, demand response, and electric storage. This transition will likely be bumpy as individual investment decisions to retire existing generations and build new, less carbon-intensive resources play out in the context of regulatory and permitting processes already in need of overhaul.

Even without taking into account the likely effects of the Proposed Rule, various regulators and regional transmission organizations have begun to ring alarm bells over near-term and long-term grid reliability. For example, in May 2023, the North American Electric Reliability Corporation (NERC) released its [2023 Summer Reliability Assessment](#), which warned that, while all regions of the United States were expected to have adequate resources for *normal* summer peak load and conditions, nearly every region in the United States other than the mid-Atlantic and parts of the Southeast face elevated "risks of electricity supply shortfalls during periods of more extreme summer conditions."^[15] Similarly, on May 15, 2023, NERC issued its highest alert level ever, advising operators to take precautionary actions to prepare for cold weather and extreme weather events.^[16] In its Level 3 Alert, NERC noted that "the resource mix is undergoing significant change at a rapid pace. The system is becoming more reliant on variable energy resources and natural gas. Extreme winter weather

events have stressed the supply of traditional fuels and the dependability of new resources."[\[17\]](#)

Even in PJM Interconnection (PJM), which NERC did not identify as at elevated risk this summer, there is concern that the rate of resource retirement will outpace the replacement rate. In February 2023, prior to issuance of the Proposed Rule, PJM issued a report[\[18\]](#) that found that over 20% of PJM's current installed capacity is at risk of retirement by 2030, primarily due to thermal generation retirements. PJM noted that while its interconnection queue contains proposed replacement resources with sizable nameplate capacity (290 GW), much of this capacity is renewable generation, and historically, only about 5% of renewable projects that enter the PJM queue achieve commercial operation. On top of this low completion rate, PJM noted that many megawatts of intermittent renewable capacity would be needed to replace 1 MW of thermal baseload capacity. As a result, PJM faces the prospect of a narrowing reserve margin due to the potential mismatch between retirements and replacements. The Proposed Rule may increase that risk, absent rapid and effective reform to the generator interconnection process.

The Proposed Rule does address reliability concerns directly, asserting that "[p]reserving the ability of power companies and grid operators to maintain system reliability has been a paramount consideration in the development of these proposed actions. Accordingly, these proposed rules include significant design elements that are intended to allow the power sector continued resource and operational flexibility and to facilitate long-term planning during this dynamic period."[\[19\]](#) The Proposed Rule points to certain elements intended to address grid reliability, such as "subcategories of new natural gas-fired combustion turbines that allow for the stringency of standards of performance to vary by capacity factor; subcategories for existing steam EGUs that are based on operating horizons and fuel reflecting the request of industry stakeholders; compliance deadlines for both new and existing EGUs that provide ample lead time to plan; and proposed state plan flexibilities."[\[20\]](#)

In addition, the Proposed Rule suggests that when the retirement of an EGU could trigger reliability issues, grid operators have access to processes that allow them to provide "additional revenues to support the EGU's continued operation until longer-term mitigation measures can be put in place."[\[21\]](#) EPA appears to be referring to system support resource (SSR) agreements that can be used to postpone retirement and keep generation available where it is critical to reliability. However, SSR agreements can be costly to ratepayers and are not an efficient market approach that grid operators prefer to rely on for lengthy periods.

EPA's projections of likely changes to the grid over time due to the Proposed Rule indicate that "[r]etirements are offset by additions, along with reserve transfers where/when needed, which demonstrates that ample compliance pathways exist for sources while preserving resource adequacy."[\[22\]](#) The Proposed Rule does not address, however, the growing interconnection queue backlogs experienced in many parts of the country. Lawrence Berkeley National Labs released a report in April 2023[\[23\]](#) indicating that the typical project completed in 2022 spent five years in queue for interconnection approval, compared to three years in 2015 and fewer than two years in 2008. This backlog is only expected to grow as the IRA spurs interest in developing new renewable energy and battery storage projects.

In June 2022, FERC issued a [notice of proposed rulemaking](#) that identifies numerous and sweeping changes to the generator interconnection process to attack this growing backlog and streamline the interconnection process in the face of ever more new resources trying to connect to the grid. However, it is uncertain when FERC will issue a final rule or what reforms the (currently politically split, four-member) FERC will include when the rule is finalized. Moreover, any final rule will likely rely on future compliance filings by regulated utilities to implement reforms, and even successful reforms will take time to ease the queue backlog.

EPA intends to hold two informational webinars on the Proposed Rule on June 6 and June 7, 2023. Unless extended by EPA, comments on the Proposed Rule are due July 24, 2023.

Endnotes

- [1] [New Source Performance Standards for Greenhouse Gas Emissions from New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units, 88 Fed. Reg. 33240 \(May 23, 2023\).](#)
- [2] [Proposed Rule at 33243.](#)
- [3] [42 U.S.C. § 111\(a\)\(1\).](#)
- [4] [Proposed Rule at 33371.](#)
- [5] [Proposed Rule at 33359 \(Table 5\).](#)
- [6] [Proposed Rule at 33420.](#)
- [7] [EPA, Fact Sheet Greenhouse Gas Standards and Guidelines for Fossil Fuel-Fired Power Plants Proposed Rule, at 2.](#)
- [8] [Global CCS Institute Database.](#)
- [9] ["Only Still-Operating Carbon Capture Project Battled Technical Issues in 2021."](#)
- [10] [Large-Scale Commercial Carbon Capture Retrofit of the San Juan Generating Station; see also "Coming EPA Power Plant Rules Will Put Carbon Capture to the Test, but Better Oversight Is Needed, Critics Say."](#)
- [11] [Proposed Rule at 33243.](#)
- [12] [Proposed Rule at 33299.](#)
- [13] [Proposed Rule at 33290.](#)
- [14] [Proposed Rule at 33420.](#)
- [15] [NERC 2023 Summer Reliability Assessment at 5.](#)
- [16] [NERC Level 3 Alert: Essential Actions for Cold Weather Preparations for Extreme Weather Events.](#)
- [17] [Level 3 Alert at 15.](#)
- [18] [Energy Transition in PJM: Resource Retirements, Replacements & Risks.](#)
- [19] [Proposed Rule at 33415.](#)
- [20] *Id.*
- [21] [Proposed Rule at 33416.](#)
- [22] [Proposed Rule at 33415.](#)
- [23] [Queued Up: Characteristics of Power Plants Seeking Transmission Interconnection as of the End of 2022.](#)

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