

August 8, 2023

SUBMITTED VIA REGULATIONS.GOV

The Honorable Michael S. Regan
Administrator
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, DC 20460

RE: EPA Docket ID EPA-HQ-OAR-2023-0072; FRL-8536-02-OAR; New Source Performance Standards for Greenhouse Gas Emissions From New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Emission Guidelines for Greenhouse Gas Emissions From Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule

Dear Mr. Regan:

Electric Reliability Council of Texas, Inc. (ERCOT) respectfully submits these comments regarding the Environmental Protection Agency's (EPA) proposed rule affecting greenhouse gas (GHG) emissions from electric generating units (hereinafter, "proposed rule" or "the rule"), which was published in the Federal Register on May 23, 2023.¹ ERCOT is concerned that the emissions standards proposed in the proposed rule are premised entirely on technologies that have not yet materialized and that have not yet been demonstrated to be physically or commercially viable. If these technologies do not develop on the timeline anticipated by EPA, existing generators that provide critical functions such as dispatchability and grid inertia will be forced to retire, and customers could face severe power shortages in future years. ERCOT therefore strongly urges the EPA to reconsider proceeding with this rule at this time. Alternatively, ERCOT requests that the EPA include in the rule a measure that would require an annual review of the development of these technologies and the status of any necessary replacement generation, transmission, and transportation infrastructure, with the ability to delay the rule's compliance timelines if the necessary technologies and infrastructure do not develop, or do not develop along the timelines expected.

Background

ERCOT is the independent system operator (ISO) designated by the Public Utility Commission of Texas (PUCT) for the purpose of managing the flow of power on the ERCOT transmission grid, which serves the majority of customers in the State of Texas. Texas law assigns ERCOT a number of critical functions, including the responsibility to "ensure the reliability and adequacy of the regional electrical network" Tex. Util. Code § 39.151(a)(2). ERCOT's most basic function in ensuring system reliability is to individually dispatch hundreds of generators located

¹ These comments supplement the comments ERCOT jointly submitted with Midcontinent Independent System Operator, Inc. ("MISO"), PJM Interconnection, L.L.C. ("PJM"), and Southwest Power Pool, Inc. ("SPP").

across the system to match the system demand (or “load”) at every moment of every day while observing both the physical and stability limits of the transmission network that transports power between generation and load. ERCOT is also registered with the North American Electric Reliability Corporation (NERC) as the sole Reliability Coordinator (RC) and Balancing Authority (BA) for the ERCOT region under the reliability framework in section 215 of the Federal Power Act. In these roles, ERCOT has the ultimate responsibility to direct the operation of the ERCOT power grid to ensure generation and load are balanced and to take all appropriate actions needed to ensure the security of the grid during emergency conditions. As part of its role under state law, ERCOT is also responsible for providing reports on the sufficiency of the generation supply to meet future system demand.²

Comments

I. EPA’s proposed reliance on unproven carbon capture and hydrogen technologies presents a significant risk to grid reliability.

In the proposed rule, the EPA proposes various CO₂ emissions limits for coal, gas, and oil-fired generating units, which the rule envisions can be met using either low greenhouse-gas (GHG) hydrogen or carbon capture and sequestration (CCS). ERCOT is concerned with the EPA’s proposed reliance on these relatively untested technologies, which are not currently in commercial use and have not been proven to be operationally or economically feasible.

The EPA’s proposed reliance on low-GHG hydrogen presents significant concerns. Currently, none of the required infrastructure that would be necessary to produce, transport, and store hydrogen exists, and ERCOT is unaware of any proposals to build the transportation and storage infrastructure that would be necessary to deliver hydrogen to generators. ERCOT is also unaware of any generating units in Texas that are capable of burning significant quantities of hydrogen, and it is unclear whether generating units can sustainably burn hydrogen as a primary fuel source in the long run.

CCS technology raises similar concerns. To ERCOT’s understanding, only a single power plant in the United States has used CCS to date. CCS also requires pipeline infrastructure to transport sequestered carbon, and that infrastructure—like the infrastructure required to transport low-GHG hydrogen—is largely non-existent. Therefore, like low-GHG hydrogen, CCS is an unproven technology.

Depending on untested and unproven technologies to meet the nation’s future electric demand while also forcing the retirement of dispatchable generators presents an unacceptable level of risk to the reliability of the power supply. If these technologies do not materialize in a way that allows economic operation of these generating assets in a highly dependable manner, or if they do not materialize on the timeline anticipated by the EPA, the supply of electric power could be inadequate to meet demand in future years.

² 16 Tex. Admin. Code § 25.505.

II. ERCOT's limited analysis of the reliability impacts of the proposed rule underscores these reliability concerns.

While the deadline for comment has not afforded ERCOT sufficient time to conduct a thorough evaluation of the rule, ERCOT was able to conduct a limited, preliminary analysis of the reliability impacts of the rule based on different scenarios that might plausibly result from the rule. To conduct this study, ERCOT used Energy Exemplar's Aurora modeling system, which allows for simulation of unit commitment and dispatch for each selected scenario. For this study, ERCOT modeled a base case "business as usual" scenario (for comparison) and the four following "change case" scenarios that assume all coal-fired generating units will opt to retire by 2032 and that model varying degrees of replacement of those retiring units and varying fuel types for the units that replace the retiring coal units:

- Change Case 1: No replacement of coal units; combustion turbines larger than 300 MW limited to 50% annual capacity factor
- Change Case 2: Partial (~50%) replacement of coal units with new, compliant combustion turbines
- Change Case 3: Full replacement of coal units with renewables, energy storage, and combustion turbines, with all existing large (>300 MW) combustion turbines subject to 50% capacity factor limit
- Change Case 4: Full replacement of coal units with renewables, energy storage, and combustion turbines, with all existing combustion turbines subject to the 50% capacity factor limit, irrespective of size

The first two change cases reflect the possibility that the retiring coal units will not be fully replaced with dispatchable generating capacity due to cost or other logistical obstacles to building new, compliant combustion turbines that utilize low-GHG or CCS technology, and/or that the infrastructure required to produce and transport hydrogen or sequestered carbon may not exist or will not be constructed by 2032. The third change case reflects a scenario in which the retiring coal capacity is replaced with a mix of renewable generation, energy storage, and combustion turbines that are either exempt from regulation because they are smaller than 300 MW or else compliant with the EPA's proposed CO₂ emissions standards. The fourth change case reflects that same scenario, but with a 50% capacity factor applying to all combustion turbines, rather than just those combustion turbines that are larger than 300 MW and that currently have an annual capacity factor greater than 50%. ERCOT modeled this scenario only to illustrate the potential impacts of requiring all existing gas units to comply with a 50% capacity factor limitation, given that EPA has solicited comments regarding whether the proposed size and capacity factor values should be adjusted.³

The results of the study demonstrate a distinct potential for reliability concerns if new, compliant generation does not materialize. In Change Case 1, which assumes no replacement of coal units, ERCOT's analysis indicates that the ERCOT region would experience unserved energy of 1,041,544 MWh over 227 hours in 2032. ERCOT's modeling shows that average wholesale

³ 88 Fed. Reg. 33246

energy prices in the Change Case 1 scenario would increase more than sevenfold from the base case average of \$34.35/MWh to \$250.04/MWh. These significant costs would be passed along to retail customers, imposing hardship on customers and inhibiting economic growth.

In Change Case 2, which assumes that approximately half of the coal units would be replaced with compliant combustion turbines, the amount of unserved energy would still be significant—50,621 MWh over 19 hours—while prices would also increase by 74% to \$59.83/MWh.

In Change Case 3, which is the most optimistic scenario, ERCOT would still expect 9,042 MWh of unserved energy over four hours with an increase in cost to \$45.42/MWh. This scenario assumes there are no material barriers to building new combustion turbines that can comply with the proposed CO₂ emissions standards, which ERCOT believes is a questionable assumption, given the nascent and unproven state of low-GHG hydrogen and CCS technology.

Change Case 4 is similar to Change Case 3, except that it assumes all combustion turbines would be subject to the 50% capacity factor limitation. In this scenario, expected unserved energy would increase to 14,793 MWh over five hours, while energy prices would increase to \$45.71/MWh. ERCOT underscores that the quantity of unserved energy in Change Case 4 is still 66% greater than in Change Case 3, which would counsel against expanding the 50% capacity factor to units smaller than 300 MW (as noted below, EPA should consider increasing this capacity factor limitation, if it chooses to proceed with this rule).

In addition to the concerns outlined above related to reliance on unproven CCS and low-GHG hydrogen technologies, the EPA should consider these additional factors when evaluating the results of the four change cases:

- 1) ERCOT's analysis does not consider the impacts of supply chain constraints that would likely be associated with a nation-wide replacement capacity build-out. Delays in replacing existing generation with the replacement generation described in the change cases would result in increases in the amount of unserved energy for each of the change cases.
- 2) Due to limitations of the Aurora tool, this analysis does not consider the additional reliability risk attributable to the increased reliance on intermittent wind and solar generation, which would likely result in a substantial increase in the expected unserved energy in each change case.⁴
- 3) For the energy generated in each of the change cases to be reliably delivered to load, significant transmission system additions will be required. The change case outcomes assume full delivery of energy from the new resources. However, non-coal-fired generation cannot always be installed at former coal-fired generation sites. In actual circumstances, the process of replacing large amounts of existing coal-fired generation with new generation will require substantial changes in the transmission system and

⁴ ERCOT would need significant additional resources and time to conduct a study of the amounts of future unserved energy based on renewable intermittency. This study would require ERCOT to combine its use of the Aurora tool with its Strategic Energy & Risk Evaluation Model (SERVM).

potentially other energy supply infrastructure. These non-generation infrastructure changes could take years to complete. Any delays in developing this additional infrastructure would increase the estimates of unserved energy in each change case.

ERCOT Recommendations

1. EPA should reconsider proceeding with the proposed rule.

The above analysis highlights the distinct reliability risks of proceeding with the rule as proposed. ERCOT is concerned that owners of coal units will choose to retire their units rather than bring them into compliance with the rule, which would require a significant amount of compliant, dispatchable generation to replace those lost units along with corresponding transmission additions that would not otherwise be necessary. If investors do not see fit to spend the likely substantial sums needed to construct compliant, dispatchable generation (even accounting for subsidies available under the Investment Reduction Act (IRA)) due to concerns about the viability of the technology or the absence of the necessary pipeline infrastructure, or if the necessary transmission improvements are not built in a time frame to facilitate the delivery of the energy from the new resources, then the ERCOT region could be facing a significant increase in power outages along with an exponential increase in the average price of energy. Given these significant feasibility concerns, ERCOT strongly urges EPA to reconsider moving forward with the proposed rule at this time. If and when stronger evidence emerges to demonstrate the feasibility of low-GHG hydrogen or CCS, the EPA could proceed with the rule at that time. Until then, this proposal presents a major reliability risk.

2. EPA should adopt the Joint ISO/RTOs' proposed rule features, including an annual evaluation of the progress of low-GHG hydrogen and CCS technologies.

If EPA nevertheless chooses to proceed with the proposed rule, ERCOT recommends that the EPA consider including the additional rule features highlighted in the comments of the Joint ISOs/RTOs, which would provide greater ability to avoid the most significant reliability risks associated with the proposed rule. Most importantly, ERCOT would urge EPA to include in the rule a requirement that EPA conduct an annual evaluation of the progress of low-GHG hydrogen and CCS technologies and make explicit findings of fact regarding whether these technologies are on pace to be achieved by the compliance deadlines. In this annual evaluation, EPA would also consider whether new, compliant generation is being developed to replace dispatchable generators that have announced retirements as a result of the rule, whether the needed hydrogen and/or carbon transport infrastructure is being developed, and whether the transmission infrastructure needed to carry the power from new, compliant generators is being built. This rule feature would provide that, if EPA finds the technology is not progressing on a schedule required to facilitate timely compliance, or if sufficient new, compliant generation and the required transportation and transmission infrastructure is not being developed on a timeline that would facilitate that compliance, then the date of the rule's implementation would be delayed to allow for further development of the technology, generation, or infrastructure. Ultimately, grid reliability requires a higher level of certainty about the future state of the generation needed to serve customer demand; this proposed process would allow EPA to ensure that the rule does not impair reliability.

If the EPA is unwilling to agree to this “technology check-in” proposal, a second-best alternative proposal, also described in the Joint ISOs/RTOs’ comments, would be to allow grid operators to flag or identify any existing units, or classes of units, subject to retirement that may be needed to maintain local or system-wide reliability. Such units would be allowed to run beyond the defined emissions limits for the defined period of reliability need.

3. EPA should increase the 50% capacity factor threshold for combustion turbines larger than 300 MW.

In addition to these rule features, and in response to the EPA’s request for comments on the appropriate capacity factor for natural gas generation, ERCOT recommends increasing the capacity factor threshold for existing natural gas generation larger than 300 MW beyond 50% to allow these generators to run at a higher level. ERCOT’s experience with renewable energy suggests that having significant amounts of dispatchable gas generation will be critical in the near term to ensuring system reliability in a system that is dominated by non-dispatchable, intermittent renewable generation. Effectively limiting certain natural gas generators to an arbitrary 50% limit will only impair the economics of these units, potentially resulting in their retirement, when they are needed to help facilitate the energy transition EPA seeks to pursue.

4. EPA should clarify the definitions of “system emergency” and “net-electric sales.”

Subject to the above concerns with the proposed rule, ERCOT agrees with EPA’s proposal to allow gas-fired units that are subject to the 50% capacity factor limitation and that are called on during a system emergency to operate without impacting the calculation of the unit’s capacity factor. In the proposed rule, the EPA solicited “comments on amending the definition of system emergency to clarify how it would be implemented.”⁵ The current definition of a system emergency is:

any abnormal system condition that the RTO, ISO, or control area administrator determines requires immediate automatic or manual action to prevent or limit loss of transmission facilities or generators that could adversely affect the reliability of the power system and therefore call for maximum generation resources to operate in the affected area, or for the specific affected EGU to operate to avert loss of load.⁶

ERCOT echoes the Joint ISO/RTOs comments recommending that EPA strike the word “abnormal” from this definition. Including this term creates unnecessary confusion, since the ISO should have flexibility to address any conditions that pose a significant risk to reliability.

Additionally, ERCOT notes EPA’s explicit statement that this exception would apply only to those units that are actually called to come online during an emergency.⁷ ERCOT recommends that EPA instead clarify that this definition should also apply to units that are already operating

⁵ 88 Fed. Reg. 33333.

⁶ 40 C.F.R § 60.5580.

⁷ 88 Fed. Reg. 33333, n.515 (“Electricity sold by units that are not called upon to operate due to a system emergency (e.g., units already operating when the system emergency is declared) is counted toward the percentage electric sales threshold.”).

when the emergency begins, as those units provide the same sort of reliability benefit to the system and would be unfairly penalized for operating during an emergency as compared with units that were brought online to mitigate the emergency condition. Without this change, generators might be incentivized to go offline prior to an anticipated emergency condition with the expectation that the grid operator will call them online to operate, thereby exempting them from accruing hours towards the capacity factor limit. This could in turn have the effect of causing the emergency to occur earlier than anticipated when the grid operator may have fewer tools available to address the condition.

Finally, ERCOT recommends revising part (4) of the definition of “net-electric sales”—which includes the reference to “system emergency”—to clarify that an actual *or anticipated* system emergency should qualify for the exemption from accruing against the capacity factor limit. In most cases, grid operators can forecast emergency conditions before they occur based on load forecasts and near-term information about generator availability. In cases where the grid operator explicitly determines that the operation of a unit is needed to avoid or mitigate an emergency, the unit owner should not be required to count those hours towards its capacity factor for the same reasons that would apply during an actual emergency. Grid operators should not be required to wait until they are in an emergency condition to be able to use generation that may be limited due to a capacity factor restriction. ERCOT recommends that EPA revise part (4) of the definition of “net-electric sales” as follows:

Net-electric sales means:

* * *

(4) Electric sales that result from an actual or anticipated system emergency are not included when calculating net-electric sales.

ERCOT greatly appreciates the EPA’s consideration of these comments and would be pleased to discuss these matters with the EPA in further detail.

Respectfully Submitted,

/s/ Woody Rickerson

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