

Regulations for Existing Natural Gas Turbines Under Clean Air Act Section 111(d)

Key Programmatic Design Elements for EPA to Consider

The U.S. Environmental Protection Agency (EPA or Agency) announced in March that it will not finalize the previously proposed Clean Air Act (CAA) section 111 regulations for greenhouse gas (GHG) emissions from existing natural gas turbine electric generating units (EGUs or units), which would have required that the largest existing units either retrofit with carbon capture and storage (CCS), blend hydrogen, or take capacity factor limitations. Instead, later this year, EPA intends to issue a new proposal that will address GHG emissions from a broader swath of the existing natural gas turbine EGU fleet. EPA has indicated that this new proposal is likely to be multi-pollutant in nature, focusing on GHG emissions, as well as criteria and hazardous air pollutants. As a first step in developing a new proposal, EPA has opened a docket to take comments from stakeholders.

EEI's member electric companies own and operate much of the existing natural gas generating turbine fleet. EEI and its member electric companies have actively and constructively engaged with the EPA on the Agency's full suite of climate and environmental regulations for power plants, including the existing natural gas-based generating turbine fleet. These companies are leading the clean energy transformation and are committed to getting the energy they provide as clean as they can as fast as they can, without compromising customer reliability and affordability. As of the end of 2023, emissions from the power sector were 41 percent below 2005 levels, the lowest they have been in 50 years, even while demand for electricity has doubled during this period. To the maximum extent possible, any EPA regulation for these units—as for any regulated units—should support and facilitate the emissions reductions and clean energy progress already being made by electric companies through their fleet transition plans and support continued progress.

EEI is focused on ensuring that any final environmental or climate regulations for power plants support the industry's work to develop and deploy clean energy technologies in service of a resilient clean energy future. Operational flexibility and new, dispatchable, clean technologies are essential to providing the reliable electricity that customers need at an affordable price. The power sector is committed to working with EPA and all other stakeholders to find a workable approach to setting emissions guidelines for existing natural gas units.

The existing natural gas-based turbine fleet is diverse, from a size, technology, efficiency, emissions, and operations perspective, which makes developing a workable regulatory scheme challenging. At this stage of the regulatory process, EPA should focus on collecting additional data and information about the fleet to facilitate the development of efficient and effective standards. In addition, there are several critical elements that must inform the Agency's efforts as it moves to propose standards for existing natural gas-based units:

The Critical Role of Natural Gas Turbine Generation

Natural gas-based turbines will continue to play a critical and evolving role in integrating increasing amounts of renewable generation, providing necessary capacity and essential reliability services, as well as helping to meet growing demand while supporting customer

affordability. Maintaining the diversity of the existing natural gas fleet is essential to ensuring reliability and affordability of the grid while enabling the increased integration of renewable assets throughout the clean energy transition. The complexities of that ongoing transformation—including the development of new generation and grid technologies, real and projected load growth, supply chain considerations and the need for additional transmission assets, among other issues—only serves to increase the importance of the natural gas-based turbine fleet and make its operational trajectory difficult to predict with certainty.

Natural gas-based turbines currently are the most flexible units given their ability to ramp quickly, especially as compared to other dispatchable units. The fast-ramping capability of gas-based turbines both minimizes emissions related to start up and shut down and supports the reliable integration of variable renewable generating resources. These same turbines provide consistent, 24/7 power when called upon to provide consistent thermal load. Any proposed emissions guidelines for existing natural gas turbines should recognize these attributes of natural gas-based turbines in its program design, ensuring that these resources can continue to play this essential role.¹

Natural gas will continue to play an important role in the future energy mix, especially when paired with more efficient generation and emission reduction pathways. Natural gas generation, along with long duration energy storage, renewables, and nuclear, will play a significant role in managing reliability going forward. The existing natural gas fleet—coupled with the ability to build new, highly efficient natural gas generation to help address resource adequacy concerns—is critical to help the power sector meet growing demand. The United States is experiencing an unprecedented rate of electric load growth – driven by data centers, artificial intelligence, and population growth. Additional load growth is also expected from the onshoring of manufacturing, clean technology manufacturing (e.g., electric vehicles, battery, and solar panels/wafers) and associated supply chains. The responsibility of electrifying other sectors will further drive generation needs over the next two decades.

This is especially true as coal-based units retire; new demand will be met with a mix of natural gas and renewable sources of generation, with natural gas generation playing an essential role in meeting demand and managing reliability concerns. The electric sector will need flexibilities and the ability to run existing dispatchable generation as they factor in how much new generation

¹ For example, EPA’s own Regulatory Impacts Analysis for the CAA 111 regulations finalized in 2024 found that natural gas generation will continue to play an important role in the future energy mix, especially paired with more efficient generation and emissions reductions pathways, including CCS. A recent study found that gas capacity will remain relatively flat through 2042 but could increase measurably in some scenarios as smaller units come online to backfill lost ramping capacity from larger units. Moreover, natural gas generation, along with storage, renewables, and nuclear, will play a significant role in managing reliability going forward. See EFI Foundation, *How Much, How Fast? Infrastructure Requirements of EPA’s Proposed Power Plant Rules* (Oct. 2023), [EPA-H2-Infrastructure-1.pdf \(efifoundation.org\)](https://efifoundation.org/EPA-H2-Infrastructure-1.pdf).

may need to be built to support growth and future demand. The ability to run existing generation will be a factor in how much new generation may need to be built. Accordingly, EPA should ensure that any future emissions guidelines acknowledge and work with these realities to ensure unit-level compliance, sector-level emissions reductions, and overarching grid reliability.

Essential Program Design Elements and Needed Compliance Flexibilities

The existing regulatory framework and recent court decisions outline some limitations, but also provide EPA some latitude as to how to set standards to address emissions from existing natural gas-based turbines. The limitations revolve around how EPA determines the “best system of emission reduction” (BSER) for existing units, under CAA section 111(a), which is the first step in proposing emissions guidelines for existing units. However, EPA—and the states that will play a lead role in applying the guidelines based on the BSER to individual existing units under CAA section 111(d)—have numerous compliance options that can be used to ensure effective and efficient implementation of any final standards/presumptive standards. These options can provide flexibility that will be essential to achieving emissions reductions from existing natural gas units while also supporting the delivery of affordable and reliable electricity to customers.

Accordingly, the design of any final existing source guidelines should:

- *Retain necessary capacity to preserve reliability:* As coal-based units opt to retire through the end of this decade and throughout the 2030s, the existing source guidelines for natural gas-based units should recognize the role that these lower-emitting units can play in replacing the reliability attributes leaving the system. Regulations should therefore incent the retention of dispatchable capacity to support intermittent non-dispatchable resources, address the increase in demand, address critical peak demand periods, and recognize the need to replace generation capacity.
- *Reduce overall sector emissions and work in conjunction with other regulations:* The guidelines should take into consideration the other proposed section 111 rules for existing coal and new natural gas units and be aligned with rules to address hazardous air pollutants and nitrogen oxides emissions from existing natural gas-based units. Aligning compliance timetables and requirements would be consistent with this Administration’s goal of a holistic approach to the power sector and enable companies to engage in informed resource planning. EPA should consider how the overlapping requirements between these three rules may interact with one another.
- *Use the most efficient units possible:* EPA regulations should recognize the value of the most efficient natural gas units in the fleet by developing an effective approach for reducing greenhouse gas emissions while simultaneously utilizing these units to meet electricity demand and growth. EPA should avoid placing restrictive limits on existing baseload combined cycle units, which are and will be relied on to support the clean energy transition, that may cause smaller existing combustion turbines to run more to

handle this load.² As these units are generally less efficient, this could increase GHG emissions across the fleet.

- *Focus investments appropriately:* EPA should encourage existing efficient units to continue to operate to support the increasing demand of the grid, and not disincentivize by imposing technological requirements that cannot be reasonably achieved or restrict operation of these units by imposing capacity factors that limit operation. EPA's guidelines should consider whether new existing source regulations would encourage increased investment in new natural gas-based generation to ensure adequate capacity and energy. These guidelines should consider whether near-term operation of existing units fosters longer-term investments in an array of cleaner generating resources.

Providing compliance flexibility under CAA Section 111 also is consistent with EPA's stated goal of a holistic approach to power sector regulations and is a way for EPA to account for these essential program design aims. As EPA looks to address emissions from natural gas-based units, guidelines for these units should provide a similar array of compliance flexibilities—if not more and more varied ones—to those already offered the states for the existing coal-based fleet, including:

- *Allowing states to access a range of compliance flexibilities:* EPA should explicitly allow states and units to use mass-based compliance approaches, including trading programs, and should expand the availability of averaging provisions, including the ability to utilize rolling and multi-year averages for compliance, in state plans. Mass-based approaches are essential for allowing operational flexibility for these units that are needed to support reliable operations to maintain grid integrity. EEI's white paper on mass-based approaches is attached as Appendix A. Expanded averaging provisions, including the ability to use rolling and multi-year averages for compliance in state plans, also are important for reliability and emissions reductions. Those averaging provisions included in the proposed regulations for new natural gas-based units and existing coal-based units should both be included as options in guidelines for regulating existing natural gas-based units.
- *Using subcategories or otherwise tailored applicability:* EPA should develop subcategories or use applicability requirements specifically tailored to the diversity of existing natural gas-based EGUs, including the development of requirements based on unit size, operational and reliability considerations, unit age and expected retirement, among others. More complete information about the existing natural gas fleet will help EPA and other stakeholders determine which subcategories or applicability requirements both achieve emissions reductions and facilitate reliable, affordable operation of these

² As EEI noted in previous comments to the Agency on the suite of CAA section 111 rulemakings, Carbon Capture and Storage (CCS) technology is a promising technology that is not currently adequately demonstrated and deployable across the fleet consistent with the statutory requirements EPA must meet to show a technology is adequately demonstrated as the BSER.

units and the larger energy grid. In addition, consistent with the CAA, EPA should enable states and unit owners and operators to make decisions that reflect the age, useful life, and changing usage patterns of some of these units, including older simple cycle units. Deciding future retirement dates, capacity factors, and other operational parameters for these units is best addressed through flexible, tailored state resource planning processes. Having a flexible regulatory scheme that allows for these decisions to be determined during the state planning process is essential.

- *Retaining and expanding implementable remaining useful life and other factors (RULOF) approaches:* CAA Section 111(d) explicitly notes that states can take into account RULOF when setting emissions standards for individual existing units. EPA affirms this authority in the recently finalized guidelines for coal-based units that RULOF may be used to particularize the compliance obligations for an affected unit when a state demonstrates that it is unreasonable for that unit to achieve the applicable degree of emissions limitation or compliance schedule determined by EPA. However, while EPA offered a RULOF pathway in the recently final guidelines, EPA should provide for additional flexibility for natural gas-based turbines that need to utilize a RULOF approach. Notably, the RULOF approaches outlined by EPA are accessible during state plan development, but are difficult to use for adapting and changing circumstances. EPA should make RULOF more accessible to states to allow for varying and potentially needed changes to unit specific standards to help address changing circumstances more effectively.
- *Include specific reliability provisions:* EPA should include reliability-specific provisions in any future rulemaking and should work with grid operators and the Federal Energy Regulatory Commission (FERC) to create a mechanism for exemptions for units that are needed for grid reliability that cannot otherwise meet the rule requirements for their units, or for other unforeseen issues. EPA should also include flexibilities for units with specific reliability capabilities that are designated to operate in certain modes to maintain reliable functioning of the grid and/or during grid restoration emergencies. These flexibilities should also be extended to other units when then they are utilized to maintain and respond to reliability of the grid.
- *Leveraging new and existing state programs:* EPA should make explicit its willingness to consider both new and existing state trading programs for existing sources for inclusion in state implementation plans. This could provide simple, straightforward compliance for numerous states and units, and should also be easily implemented by affected sources assuming that states can make the appropriate stringency showings. Examples of existing state programs that EPA could consider as complying with existing source guidelines include the Regional Greenhouse Gas Initiative (RGGI) in the Northeastern U.S., and Western states' GHG programs. EPA also should not rule out the development of new state-based programs that would satisfy the requirements of the CAA but reflect state priorities and goals.

Need for Additional Information

EPA should use the most up to date and best available information when designing any regulatory program for existing natural gas turbine units. Every unit is different and unique in the function it will serve, coupled with its environment and location. When considering the needs of every state, there are vast differences from one another in terms of load growth, reliability needs, and available resources. The diversity of existing units will require more flexibility in capacity factor thresholds and higher ranges or more subcategories for emissions standards compared to EPA's recently finalized standards for new natural gas combustion units. Additionally, regulating these diverse units will require significant additional flexibilities, as discussed above. Given these realities, there are a number of additional pieces of technical information EPA should gather as it works to propose new regulations. This includes: future capacity factors, projected number of startups, heat rate, emissions profiles and other factors that can impact the emissions profiles of these diverse units, including but not limited to:

- *Unit type:* EPA should gather information on the performance differences between simple cycle and combined cycle turbines, as well as the differences between turbines of the same type that may vary by make, model, vintage and age, and additional controls installed to address NOx and other pollutants.
- *Unit location:* The Agency should also analyze the impacts of unit location, as transmission constraints, seasonal or other variable load requirements, and proximity to load can impact how units are dispatched and their environmental performance.
- *Special functions:* As mentioned above, many existing natural gas turbines fill specific grid functions—especially simple cycle turbines—including the ability to utilize dual fuels, have black start capabilities, and quick start abilities to help integrate renewable assets. These grid functions will have significant impacts on the environmental performance of these units.

The Agency is also soliciting feedback about a potential multi-pollutant approach that addresses GHG emissions along with both nitrogen oxide (NOx) and any hazardous air pollutant (HAP) emissions under other CAA authorities. EPA should also conduct an analysis and gather additional data on potential control strategies for these other pollutants and analyze the current universe of installed controls against the considerations listed above. EPA should consider which processes would be best for gathering and analyzing this essential information.

Conclusion

EEI looks forward to continuing discussions with EPA on the existing gas fleet as the Agency works toward a new proposal. Further, individual EEI members are also interested in speaking with EPA regarding issues specific to their company. EPA should take time to speak with these individual EEI members.