

EPA's Environmental Appeals Board Upholds Greenhouse Gas BACT Determination With Important Implications for Power Plant Developers

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On March 14, 2014, the U.S. EPA Environmental Appeals Board (EAB) denied Sierra Club's petition to review the greenhouse gas (GHG) prevention of significant deterioration (PSD) permit issued to La Paloma Energy Center, LLC (La Paloma) for the construction and operation of a combined-cycle natural gas-fired power plant in Texas. The EAB decision significantly defines the contours of the adequacy of a GHG Best Available Control Technology (BACT) determination for a gas-fired plant. Importantly, the decision confirms that marginal differences in efficiency among gas turbines under consideration for a project do not necessarily require selection of the highest efficiency turbine to meet BACT for GHGs. With several caveats, the decision also helps resolve the "chicken-egg" problem faced by developers, who often must commit to use of a particular make and model gas turbine prior to receiving required air quality permits, even though doing so may reduce their flexibility, both in project design and in negotiation of turbine procurement and power sales contracts. Together with a decision issued last year by the EAB affirming that less efficient simple cycle technology can satisfy BACT for GHGs, this decision affirms the permitting authority's discretion to consider the practical realities of how a new power plant is designed, built, and operated in deciding whether the proposed technology meets GHG BACT.

Background

La Paloma proposed to construct a combined-cycle facility consisting of two natural gas-fired combustion turbines, each exhausting to a heat recovery steam generator to produce steam to drive a shared steam turbine. As the EAB recounts, La Paloma stated that while "final selection of the combustion turbine model would not be made until after the permit was issued," it was considering three models, each producing different maximum baseload power: 183 megawatts (MW) from the General Electric 7FA (GE turbine), 205 MW from the Siemens SGT6-5000F(4) (Siemens 4 turbine), and 232 MW from the Siemens SGT6-5000F(5) (Siemens 5 turbine). (See EAB, Order Denying Review, *In re: La Paloma Energy Center, LLC*, PSD Permit No. TX-1288-GHG, PSD Appeal No. 13-10, slip op. at 6 (Mar. 14, 2014) (hereinafter, EAB Order).) Combined with the steam turbine's capacity of approximately 271 MW, the combustion turbines would produce a total generating capacity at the facility of 637, 681, or 735 MW, depending upon which combustion turbine model La Paloma ultimately selects. (*Id.*)

On November 6, 2013, EPA Region 6 issued the final GHG PSD Permit for La Paloma. The final PSD permit contained three different sets of emission limits based on the three models of combustion turbines that La Paloma proposed. In turn, the permit specifies three types of emission limits for each capacity scenario: (1) output rate-based emission limits (pounds of carbon dioxide per megawatt hour of electricity produced (lb CO₂/MWh)); (2) startup limits (lb CO₂/hour); and (3) total annual GHG limits on a mass basis (tons per year). (*Id.* at 7, note 3.)

Sierra Club appealed, claiming that EPA Region 6 clearly erred or abused its discretion in making its BACT determination for La Paloma “(1) by failing to base the permitted GHG emission limits for the combined cycle natural gas-fired combustion turbines that will be used at this facility on the energy efficiency of the most efficient of the three turbine models that [La Paloma] identified for potential use at this facility, and (2) by declining to require [La Paloma] to consider adding a solar thermal energy component to the proposed facility in order to further reduce GHG emissions because the Region incorrectly concluded that solar technology would ‘redefine the source.’” (*Id.* at 1.)

Generally, BACT is identified on a case-by-case basis as the maximum degree of pollutant reduction in a pollutant that can be achieved using available technology using an established using a five-step, “top-down” method. See Clean Air Act § 169(3), 42 U.S.C. § 7479(3). EPA permitting guidance from 2011 indicates that the BACT analysis for GHGs should be conducted in the same manner as it is done for any other regulated pollutant. (EAB Order at 10 (citing EPA, EPA-457/B-11-001, PSD and Title V Permitting Guidance for Greenhouse Gases, at 17 (Mar. 2011).) Thus far, BACT emission limits for GHGs essentially revolve around energy efficiency. (See, e.g., EAB, Order, *In re Pio Pico Energy Center*, PSD Appeal Nos. 12-04 through 12-06, slip op. at 71, 75 (Aug. 2, 2013) (“*Pio Pico*”). Accordingly, as the EAB states, “in this case [EPA Region 6] based the GHG emission limits for [La Paloma’s] proposed new power plant on energy-efficient design and other energy efficiency measures that are available for use at this facility.” (*Id.*)

Determination that Each of Three Turbine Types with Marginally Different Efficiencies Constitutes BACT

Sierra Club objected to EPA Region 6 establishing “alternate” GHG limits specific to each of the three turbine models, allowing La Paloma “to select whichever model it chooses after the permit is issued.” (*Id.* at 12.) Sierra Club argued that “the permitted GHG emission limits must be based on the lowest GHG emission limit that any of the three turbine models can achieve [i.e., the 909.2 lb CO₂/MWh emission limit established for the Siemens 4 turbine], regardless of which model [La Paloma] finally selects.” (*Id.*)

Because the PSD permit will be modified to delete any reference to the other turbines once La Paloma selects its model, the EAB found that “only one BACT limit ultimately will be permitted for [La Paloma’s] combustion turbines.” (*Id.* at 13.) Effectively, EPA Region 6 established separate—not alternate—BACT limits for each of three different potential projects to be built, determining that each separate limit met BACT. Thus, the EAB found that the issue was “whether the slightly higher output-based GHG permit limits for the Siemens 5 and the GE turbines represent BACT when considered on their own.” (*Id.*)

In this case, EPA Region 6 provided two justifications for declining to impose the slightly more stringent output-based GHG emission limit of the Siemens 4 turbine model on the Siemens 5 and GE models. First, EPA Region 6 explained that the marginal variations in efficiency and output-based GHG emission rates among the three turbine models are attributable to the differences in the models’

generation capacities. (*Id.* at 19.) Indeed, as the EAB notes, while the turbine that La Paloma appeared to favor was the smallest and had the highest output-based emission rate, this model also has the lowest *total annual* GHG emission limit. (*Id.* at 22.) Second, EPA Region 6 determined that the differences in the GHG output-based emission rates of the three proposed turbine models were marginal, i.e., a range of only 2.1% on a net output basis. (*Id.* at 21.)

The EAB held that EPA Region 6 “did not clearly err or abuse its discretion in determining that the GHG emission limits for all three turbine models represent BACT for highly efficient combined cycle combustion turbines, and that the separate emission limits specified for each of the three models will assure that [La Paloma] minimizes GHG emissions from the combustion turbines regardless of which model it selects.” (*Id.* at 22.)

This decision is significant because, while seemingly negligible, a 2.1% difference in turbine efficiency can actually result in quite a difference in both the pounds of CO₂e emitted to produce a given unit of energy and in the total mass emissions on an annual basis. That said, in coming to this conclusion, the EAB emphasized that EPA guidance on GHG BACT emphasizes that the focus should be on long-term averages and that use of the smaller, less efficient GE turbine in this instance would actually result in lower annual emissions and, accordingly, “the smallest environmental impact.” (*Id.*)

The decision is also significant in that it does not foreclose permitting authorities from issuing permits for new power plants that authorize the use of multiple turbine makes/models, so long as the emissions limits for each turbine are adequately demonstrated to meet BACT. This could provide project developers some flexibility so that they do not need to choose the specific turbine make and model prior to obtaining air quality permits, and thereby reduce their leverage in negotiations with turbine manufacturers. However, the EAB also noted that issuing permits for several different turbine types “complicates the permitting process” and that “permitting authorities [should therefore] encourage applicants to make the significant decisions affecting final project design before the permit is issued and ideally before the permit is issued for public comment.” (*Id.* at 13 n.9.)

Exclusion of Solar Thermal Hybrid Plant from BACT Analysis Acceptable Under Circumstances

EPA Region 6 did not require La Paloma to evaluate solar thermal generating equipment as a potential control option in its GHG BACT analysis. On appeal, Sierra Club argued that, if La Paloma used supplemental solar thermal steam, the facility would still be a predominantly gas-fired combined-cycle power plant of the same size and energy production and, thus, its purpose would not be “redefined” contrary to EPA BACT guidance. (*Id.* at 23.) Sierra Club also claimed that supplemental solar thermal energy in a natural gas combined-cycle generating process is a cleaner production process that has been demonstrated at other facilities and, thereby, should have been considered. (*Id.*)

The EAB cites its precedents for the proposition that permitting authorities have “the discretion to exclude proposed control alternatives that would constitute a ‘redefinition of the design of the source’ from the BACT analysis for that source.” (*Id.* at 24.) The EAB notes, however, that EPA’s GHG BACT guidance does not explicitly address the issue in this case (i.e., “whether a partial switch or supplementation of the primary fuel with a different type of fuel that the applicant did not initially propose as a secondary fuel would constitute a redefinition of the source”). (*Id.* at 25.) Accordingly, EAB reviews the “general principles that guide permitting authorities’ decisions as to whether a proposed alternative constitutes redefinition of the source,” including how the applicant defined the proposed facility’s “end, object, aim, or purpose.” (*Id.* at 26.) Further, per EAB precedent, these

general principles include determining whether the permit issuer then took a “hard look” at which design elements are “inherent” to the applicant’s purpose and which design elements could possibly be altered to achieve pollutant emissions reductions without disrupting the applicant’s “basic business purpose” for the facility. (*Id.*)

In this case, the EAB found that EPA Region 6’s rationale for concluding that adding solar capacity at the facility would constitute redesign of the source did *not* evidence a “hard look” because EPA’s rationale suggests that supplemental solar power generation is always redesign, providing an “automatic BACT off-ramp.” (*Id.* at 29.) However, the EAB did not remand the PSD permit because “there is sufficient evidence to support the Region’s conclusion that the supplemental solar option would constitute redesign of the source under the specific circumstances of this case given the business purpose, space limitations, and the specific design requirements of the facility.” (*Id.* at 30.) Accordingly, the EAB held that Sierra Club failed to demonstrate that EPA Region 6 abused its discretion in concluding that adding solar technology to this facility would “redefine the source.” (*Id.* at 34.)

Conclusion

The EAB’s decision to affirm the “alternate” GHG limits based on marginally different turbine efficiencies is important for developers of gas-fired power plants throughout the country.

- First and foremost, it affirms that selection of turbines for new power projects need not be dictated by marginal differences in efficiency.
- Second, it provides some flexibility for power plant developers to keep their options open and not commit to any specific turbine manufacturer’s make and model prior to submitting its application and possibly throughout the permitting process. This can only better preserve both flexibility and leverage for the developer in negotiation of turbine procurement and power sales agreements.

Together with the EAB’s decision from last year affirming that less efficient simple cycle technology can satisfy BACT for GHGs (at least where the project was carefully defined as a quick-starting, load-following peaking plant with high efficiency across its entire load range) (*see Pio Pico*, PSD Appeal Nos. 12-04 through 12-06, slip op. at 59-70), this latest decision suggests that BACT for GHGs will not necessarily dictate selection of the most efficient generating technology to the exclusion of all other considerations, such as the specific demand for power and other operational characteristics the project is intended to supply. Moreover, while both decisions remain subject to judicial review—indeed, the final permitting decision for Pio Pico was just announced in the Federal Register on the same day as the EAB issued its decision for La Paloma (79 Fed. Reg. 14505 (Mar. 14, 2014))—their outcomes to-date indicate that the advent of GHG permitting is not providing opponents of fossil-fueled generation a means to halt efficient gas-fired generating projects simply by pointing to another more efficient, less carbon intensive option that arguably should have been used instead.

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