Energy Efficiency as Best Available Control Technology: Practices and Possibilities

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I. INTRODUCTION

Energy efficiency will be an essential component of any meaningful federal, state, or local effort to control greenhouse gas ("GHG") emissions.[1] The Obama administration's Clean Power Plan ("CPP"), previously poised to become a centerpiece of U.S. climate action, would have included ambitious energy efficiency measures.[2] However, with the CPP unlikely to come to fruition under the presidency of Donald Trump,[3] this Article examines an avenue through which energy efficiency may be deployed by other means, including by states: the Prevention of Significant Deterioration ("PSD") provisions of the Clean Air Act ("CAA").[4] These provisions require certain pollution controls for most new construction of, or major modifications to, power plants and other major stationary sources of air pollution.

The Environmental Protection Agency ("EPA") began regulating GHGs under the PSD program in 2011.[5] In *Utility Air Regulatory Group v. EPA* (2014), the Supreme Court largely upheld EPA's approach, allowing EPA to require GHG controls for sources otherwise subject to PSD regulation.[6] EPA's approach to PSD permitting for GHG emissions is outlined in a 2011 guidance document ("GHG Guidance") that explains, among other things, the role envisioned for energy efficiency as "best available control technology" ("BACT") to be employed on-site at regulated facilities.[7]

This article argues that EPA's approach in the GHG Guidance is legally valid; that it should be pursued more aggressively, and that there is a plausible legal basis for an interpretation of BACT to include demand-side efficiency.[8] Part II provides a background on energy efficiency and the PSD program. Part III examines energy efficiency as BACT as it has been employed in practice. Part IV examines legal issues pertaining to different types of efficiency under the PSD program. Part V concludes.

II. BACKGROUND

A. The PSD Program and Best Available Control Technology

The PSD provisions of the CAA operate essentially nationwide,[9] requiring PSD permits for the construction of new major air-polluting facilities, or modifications to existing facilities, that meet threshold pollution levels.[10] PSD permits are issued by either a state agency or an EPA regional office as the permitting authority.[11] To receive a permit, a facility must be "subject to the best available control technology" for each PSD-regulated pollutant emitted by the facility.[12] As noted, EPA treats GHGs as a pollutant subject to regulation under the PSD provisions.[13]

The CAA provides that a permitting authority's selection of best available control technology ("BACT") for a pollutant under a given permit is a case-by-case determination made by balancing benefits with costs among achievable emission limitation options. These options broadly include "production processes and available methods, systems, and techniques" for pollution control. It is worth repeating the relevant statutory language in full, which defines BACT as

> an emission limitation based on the maximum degree of reduction of each pollutant subject to regulation under this chapter emitted from or which results from any major emitting facility, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each such pollutant. . . .[14]

In 1990, EPA issued a draft guidance document to assist permitting authorities in conducting analyses to select BACT for PSD permit applicants.[15] Most permitting authorities follow these guidelines, which set forth a "top down" method for determining BACT for a given facility: Step 1 identifies emission limitation options; Step 2 eliminates unfeasible options (considering both commercial availability and technical feasibility); Step 3 ranks remaining options by emission control effectiveness; Step 4 balances costs with environmental benefits, and often results in elimination of more stringent control options; and Step 5 selects the BACT.[16] Generally permit applicants will themselves propose BACT, often by walking through the top-down process; this often forms the basis of the permitting authority's own top-down analysis.

EPA has described BACT as including either or both of: "inherently lower polluting processes/practices," i.e., making changes to processes, inputs, or equipment to reduce pollution; and "add-on controls," i.e., technologies that remove pollutants from an emissions stream.[17] While state permitting authorities have flexibility in the BACT selection process, and significant discretion to consider

BACT on a case-by-case basis, EPA may step in where a state makes an unreasonable BACT determination.[18]

B. Energy Efficiency as Potential BACT

Without delving into legal issues yet,[19] it is worth initially reviewing some available and emerging energy efficiency options that may arguably serve as "production processes and available methods, systems, and techniques" to control pollution (GHGs or otherwise) as BACT at stationary sources.

For the purposes of this article, although there are various ways to define it,[20] the term "energy efficiency" (or "efficiency," where used herein) refers to the reduction in energy production needed to accomplish a given end use. This article focuses on efficiency methods within the scope of the PSD program—specifically, efficiency in the generation and use of energy produced at new or modified major stationary sources, including power plants and industrial sources. This article generally groups applicable efficiency targets into three categories: energy generation at a source facility ("generation-stage"); energy use on-site at a source facility ("facility-use"); and energy use off-site from a source facility ("demand-side").

First, generation-stage efficiency focuses on the process of combusting fuel to produce power, seeking to reduce the amount of fuel burned to produce a given amount of usable energy. Generation-stage efficiency is necessarily implemented on location at a regulated facility, whether the power produced will be used on-site (in the case of some industrial sources) or used off-site (in the case of power plants). Efficiency measures at generation stage might include: efficient designs or equipment, such as by using supercritical rather than subcritical boilers to minimize energy loss at coal-fired power plants; operational systems and practices, such as optimization of fuel and air flow via combustion controls, or in the case of some industrial facilities, the timing of energy production such to avoid energy waste; supplemental processes, such as heat loss recovery; and use of pre-treated fuels, such as coal with reduced moisture content.[21]

Second, facility-use efficiency may also be employed to reduce a facility's emissions in the case of regulated industrial sources that generate and use energy on-site. These efficiency measures might include: adoption of efficient production equipment, such as by using efficient motors in pumps, air compressors, and fans at petroleum refineries;[22] equipment retrofitting, such as by insulating kilns at cement plants;[23] energy recovery, such as with the application of lost process heat to other uses;[24] energy-saving processes, such as the use of gravity-type homogenizing silos in the mixing of raw meal at cement plants,[25] or the use of certain debarking methods to reduce energy demand in pulp and paper manufacturing;[26] and general operational equipment and practices, such as with the use of automated lighting controls and energy efficient lights at a facility.[27]

Third, demand-side efficiency would reduce energy production needed to accomplish a given set of consumer uses, reducing emissions from electric power generators supplying an electric grid.[28] Here, energy efficiency would apply just to power plants and not industrial sources, and would involve measures to promote the uptake of certain equipment and methods by downstream residential, commercial, and industrial energy users, including through: building design and retrofitting to retain warm air in the winter[29] and cool air in the summer; efficient equipment, such as efficiency-certified appliances; and systems and practices, such as automatic or remote light and heat controls.[30] As discussed in Part IV.C. below, EPA considered but rejected demand-side efficiency as an element of the Clean Power Plan.[31]

In theory, a power plant operator (or a combination of operators acting together) might employ any number of measures to promote downstream demand-side efficiency uptake. For example, an operator might: offer or pay for home assessment services to help energy users understand where they can make energy-saving improvements;[32] offer low-interest loans for users to make efficiency upgrades;[33] offer appliance rebates[34] or buybacks;[35] or fund or offer incentives for efficiency retrofits.[36] Perhaps most likely, a PSD-regulated source might purchase tradable credits in a regulated scheme, earned by companies directly undertaking aforementioned measures—i.e., a PSD permit's BACT requirement might provide that a facility must hold a given number of demand-side efficiency credits, which a facility could acquire either by undertaking demand-side efficiency-promoting activities directly, or by purchasing credits from others who have done so.

III. CURRENT PRACTICE FOR ENERGY EFFICIENCY AS BEST AVAILABLE CONTROL TECHNOLOGY

Having canvassed a range of efficiency "production processes and available methods, systems, and techniques" that might plausibly serve as BACT, this Part now explores the current approach of EPA and state permitting authorities in implementing energy efficiency as BACT. Section III.A. discusses EPA's approach to energy efficiency as BACT, specifically in the context of GHG regulation. Section III.B. then examines the reality of energy efficiency as BACT in recent air permitting determinations and BACT analyses.

A. EPA Treatment of Efficiency as BACT

As noted, "inherently lower polluting processes/practices" have long been recognized by EPA as within the scope of BACT, along with or in combination with add-on controls.[37] This category of BACT would seem to include energy efficiency methods, which are perhaps

more inherently lower polluting than any pollution controls.[38] Yet EPA had not clearly focused on energy efficiency as BACT until it began regulating GHGs through the PSD program.

EPA's approach to PSD permitting for GHG emissions is outlined in a 2011 guidance document ("GHG Guidance") explaining, among other things, how permitting authorities and regulated entities should approach the BACT selection process for GHGs using the five-step "top-down" process described in Section II.B. above.[39] In the GHG Guidance, EPA acknowledges that end-of-stack (or "add-on") controls for GHGs, such as carbon capture and sequestration, are still largely undeveloped.[40] For this reason, the GHG Guidance advises that efficiency measures will be the foundation of BACT for GHGs for the time being.[41]

Notably, the GHG Guidance interprets BACT to include the first two efficiency targets identified in the previous Part: generation-stage and facility-use.[42] As to generation-stage efficiency measures, EPA puts forward certain examples, including that combined cycle combustion turbines (more efficient than simple cycle turbines) might be included in the BACT process for natural gas-fired facilities, and that integrated gasification combined cycle might be a BACT consideration for proposed coal-fired facilities.[43] As to facility-use efficiency, EPA suggests focusing on efficiency improvements in a facility's "higher-energy-using equipment, processes or operations." For example, "the design, operation, and maintenance of a steam distribution and utilization system may influence how much steam is needed to complete a specific task," and may be optimized to reduce energy need.[44]

However, EPA limits its consideration of facility-use efficiency controls to BACT determinations for new facilities; it does not consider such controls for modifications.[45] EPA also declines to consider, as within the scope of BACT, energy used at a regulated facility but which is not generated at the facility, because such a control measure would not reduce the facility's own emissions originating "within the property boundary."[46] The GHG Guidance does not discuss demand-side efficiency—that is, measures undertaken "beyond the fence line" but which reduce emissions within the property boundary. As discussed in Part II above, demand-side efficiency may serve as BACT in a practical sense, insofar as it reduces power plant emissions; further, as discussed in Part IV below, this article adopts the position that demand-side efficiency may plausibly serve as BACT as a legal matter.

In the GHG Guidance, EPA also notes that energy efficiency "helps reduce the products of combustion, which includes not only GHGs but other regulated [] pollutants," so "energy efficiency should be considered in BACT determinations for all regulated [] pollutants (not just GHGs)."[47] This article adopts the same point of view: energy efficiency is relevant as BACT for all PSD-regulated pollutants. GHG regulation merits special attention as BACT because, for the foreseeable future, GHGs will likely be controlled through the PSD program only through efficiency measures, until and if carbon sequestration becomes viable. But in general, discussion of practical and legal issues in this article is applicable to efficiency as BACT for any pollutant.

B. Energy Efficiency as BACT in Practice

As noted above, EPA had not focused on energy efficiency as BACT until it began regulating GHGs under the PSD program. Similarly, a search of state BACT determinations suggests that state permitting authorities had not expressly considered energy efficiency as a distinct category of BACT prior to GHG regulation, even if some BACT methods also brought efficiency benefits.[48] However, with the GHG Guidance, EPA and states began requiring energy efficiency as BACT in 2011. Around that same time, EPA put out a series of white papers discussing "available and emerging technologies" for controlling GHG emissions, mostly through energy efficiency, at various PSD-regulated facilities including power plants and certain industrial sources.[49] These white papers were intended to assist permitting authorities and regulated entities in conducting BACT analyses for GHGs, though in the intervening years, only a limited range of efficiency measures have been required as BACT—generally in the form of efficient generation equipment and practices, or heat recovery and loss methods in industrial processes. Review of BACT decisions for GHG control also suggests that permitting authorities have not generally imposed efficiency requirements beyond what permittees have themselves proposed in their PSD applications.

In recent years, EPA as a permitting authority[50] has issued numerous BACT determinations considering energy efficiency measures for GHG control. In some cases, these EPA-issued PSD permits have set forth just GHG emissions limits without any specified methods prescribed to do so.[51] More commonly, EPA BACT determinations have set forth efficiency performance requirements in terms of thermal efficiency or GHG intensity, often to be achieved just through the proper use and optimization of the permittee's chosen combustion technology according to its specifications; such measures are referred to with terms like "good combustion practices," "good operating practices," and "good maintenance practices."[52] Good combustion practices include efficiency-oriented measures such as proper combustion zone mixing of air and fuel, minimization of fuel gas quality fluctuations, and proper maintenance.[53] This term can overlap with the good *operating* practices, which may also include, for instance, startup and shutdown procedures that minimize energy waste.[54] There is also some overlap between these two terms and good *maintenance* practices, which encompass such

activities as equipment inspections, optimization, and repair.[55]

Beyond general good practices, some EPA-issued PSD permits have specifically identified efficient equipment and design to be employed by the permittee as BACT. For instance, some permits have required particular turbine designs,[56] while others have required designs that accomplish waste heat recovery.[57] However, it is not clear that equipment- or design-based BACT requirements have generally accomplished more stringent efficiency controls than what permittees would otherwise have adopted on their own as cost-saving measures; indeed, EPA has generally selected BACT as proposed by permit applicants.[58] The case of a 2012 EPA Region 1 permit for a new gas-fired power plant is particularly illustrative: although the final PSD permit called for the use of an efficient combined cycle turbine as BACT,[59] this same equipment had been originally proposed in the permittee's 2008 project application—submitted prior to any BACT requirement for GHGs.[60] As currently implemented, it is not clear that efficiency as BACT is having a technology-forcing effect.

In the case of industrial facilities specifically, EPA-issued PSD permits often set forth both generation-stage and facility-use energy efficiency measures as BACT. Generation-stage measures are generally focused on good combustion practices, while facility-use measures often focus on heat loss and recovery in process heat applications.[61] Facility-use efficiency controls are more rare outside of process heat applications, though in one EPA Region 6 BACT determination for an iron production plant, the permit applicant proposed, and EPA adopted, certain energy use measures as BACT for application at different production stages: efficient materials transfer equipment in the form of mechanical conveyors, and process controls to optimize energy use.[62] One reason that facility-use efficiency measures may not be getting employed widely as BACT is that even in the case of industrial PSD-regulated sources, certain on-site industrial equipment is powered from grid-supplied electricity rather than on-site power-generation, so reductions in energy use from such equipment would not lower a facility's own emissions.

A review of state-issued PSD permits paints a similar picture as with EPA requirements for energy efficiency as BACT.[63] As with EPA regional offices, states have generally required some combination of efficiency measures to control GHG emissions at PSD-regulated sources, typically as proposed by the permit applicant: good combustion and operating practices;[64] combustion equipment specifications;[65] supplemental measures, such as waste heat recovery;[66] and efficiency improvements to on-site energy uses.[67] Some state-issued PSD permits have instead provided a numeric GHG emissions limit or efficiency measure without any specified technologies or practices to employ.[68]

Neither EPA nor any state permitting authority has apparently sought to require off-site (demand-side) efficiency as BACT. At least one state authority has expressly rejected the converse notion that BACT may address "GHG emissions that could be generated [off-site] as a result of the operation of the plant."[69] This would include, for example, a facility's use of electricity generated elsewhere. However, that agency's position that "[t]he BACT analysis is specific to the emission source"[70] is not inconsistent with this article's proposal that BACT analysis may arguably consider efficiency measures applied to off-site energy *uses* linked to on-site energy *generation*.

IV. LEGAL FRAMEWORK FOR ENERGY EFFICIENCY AS BEST AVAILABLE CONTROL TECHNOLOGY

In the time since energy efficiency has directly entered into BACT analysis with GHG regulation under the PSD program, no case law has yet emerged speaking directly to the legal validity of energy efficiency as BACT, although the Supreme Court in *Utility Air Regulatory Group v. EPA* (2014) "assum[ed] without deciding that BACT may be used to force some improvements in energy efficiency."[71] Meanwhile, published Environmental Appeals Board ("EAB") decisions include a handful of challenges to EPA and state BACT determinations related to efficiency measures, though these challenges have been brought by those seeking to impose more stringent efficiency controls, and not by regulated entities challenging energy efficiency as BACT.[72] Moreover, because no permitting authority has sought to impose demand-side efficiency as BACT, its permissibility under the PSD provisions has not been adjudicated. This Part considers generation-stage, facility-use, and demand-side efficiency under the statutory and regulatory text and relevant legal doctrine, and, in the case of demand-side efficiency, in light of recent litigation over the Clean Power Plan—concluding that, as a legal matter, all three types of efficiency may be used as BACT, although demand-side efficiency stands on shakier ground.

A. Accordance with the Statutory and Regulatory Language

The language of the Clean Air Act's BACT definition and requirement, and of the EPA's corresponding regulatory definition and requirement,[73] does not appear to preclude energy efficiency measures as BACT—whether on-site or beyond the fence line.

In relevant part, the CAA defines BACT as "an emission limitation" that is "achievable . . . through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques . . . ."[74] The regulatory definition

is relevantly identical, except that it omits "clean fuels" as an enumerated BACT option.[75]

Generation-stage efficiency easily fits into the BACT definition as the application of a "[p]roduction process[]," in that any efficiency measures would apply to the *energy* production process. Facility-use efficiency should also fit into this definition as a "[p]roduction process[]" to the extent that such an efficiency measure would apply to the production of physical products such as materials or goods. Further, any of the efficiency measures discussed herein—generation-stage, facility-use, or demand-side—may surely fit within what appears to be a broad catchall element of the BACT definition: "available methods, systems, and techniques." The implementation of efficient lighting or heating equipment and practices on-site at a regulated industrial facility, even if not going directly to production, would be a method, system, or technique that would reduce emissions. In addition, the demand-side implementation of an efficiency measure, such as through a community efficiency program, or by participating in an efficiency credit trading scheme, can be characterized as using a method or technique for limiting emissions.[76]

Further, all three efficiency types may also be characterized under the BACT definition as an "emission limitation," which is defined separately as

> a requirement . . . which limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis, including any requirement relating to the operation or maintenance of a source to assure continuous emission reduction, and any design, equipment, work practice or operational standard promulgated under this chapter.[][77]

Generation-stage, facility-use, and demand-side efficiency may all be "requirement[s]" to reduce pollution on a continuous basis—which is, in fact, a hallmark feature of energy efficiency. While generation-stage and facility-use efficiency also fit comfortably within the various enumerated limitation options ("operation or maintenance," "design," etc.), this non-exclusive list does not preclude demand-side efficiency.

Even if energy efficiency may fit into the definition as BACT, it is a separate question whether efficiency may be *applied* as BACT. The PSD provisions of the CAA require that a facility regulated under the PSD program be "subject to" BACT for each PSD-regulated pollutant.[78] Similarly, the regulations provide that a PSD-regulated facility "shall apply" BACT.[79]

Whether a facility is "subject to" BACT, as worded in the statute, or whether it "shall apply" BACT, as worded in the regulations, the language of the BACT requirement easily harmonizes with the use of energy efficiency as BACT for the purpose of on-site efficiency measures, at either use or generation stage. A facility may plainly be "subject to" efficiency measures in generating or using energy. Similarly, a facility may plainly "apply" efficiency measures in the course of generation or other on-site processes.

As to demand-side efficiency, whether a facility may be "subject to" off-site measures is at least somewhat more questionable, in that a PSD-regulated facility would not be directly subject to the efficiency *technology* itself—a demand-side user would be subject to the technology (such as new equipment or building retrofits), while the regulated facility would be subject only to making the technology available to the user. Yet as noted above, the CAA and its regulations define BACT not as technology per se, but as an "emission limitation."[80] Reading this definition in conjunction with the BACT requirement allows off-site efficiency to fit more comfortably within the language of the CAA: indeed, a facility's deployment of demand-side efficiency would make that facility "subject to" the "emission limitation" resulting from the off-site efficiency measures. Further, off-site efficiency does easily fit with the language of the regulatory BACT requirement, in that a facility would be "apply[ing]" BACT with demand-side measures, albeit applying it off-site.[81]

Another potential challenge in fitting demand-side efficiency within the CAA language is that the statutory BACT requirement specifically applies for "each pollutant subject to [PSD] regulation . . . *emitted from, or which results from*," a regulated facility.[82] The regulatory BACT requirement is relevantly the same.[83] As to generation-stage and facility-use efficiency, measures employed on-site at a regulated facility would plainly reduce emissions originating at the same facility. However, demand-side efficiency measures employed by a particular facility would be uncertain to reduce emissions from that facility. Because multiple power plants supply energy to a grid, a contraction in energy demand due to consumer efficiency would not bring a proportional generation reduction from all power producers supplying that grid; rather, certain production facilities (namely, those with higher marginal costs) would get turned off while other facilities continue to run at full capacity.[84] For this reason, a demand-side efficiency program implemented by a PSD-regulated facility might result in reduced emissions, but not necessarily in reduced emissions from the individual permitted facility itself.

However, this apparent obstacle is surmountable. Whether a demand-side efficiency measure can then be seen as acting to reduce a "pollutant . . . emitted from" a regulated facility, in accordance with the language of the BACT provisions, depends upon how the statutory and regulatory language is interpreted. Under one reading, BACT must reduce the very pollutants, regarded as a specific collection of physical matter, that would have

been emitted but for the BACT. Under this reading, demand-side efficiency would not apply unless the plant itself would experience reduced emissions due to energy demand reduction on the grid. However, a closer reading of the statute and regulations leaves room for demand-side efficiency. Looking closely at the text, BACT is applied to reduce "each pollutant subject to [PSD] regulation."[85] The use of "pollutant" in the singular indicates that pollutants are being treated categorically. Under this reading, BACT must just reduce the emissions of a pollutant that is emitted from a facility, but it is not necessary that BACT reduces hypothetical molecules of that pollutant that would otherwise have come from that very facility. Under a direct reading of the statutory and regulatory language, it is sufficient for BACT that foregone emissions due to emission limitations applied by a PSD-regulated facility are occurring *somewhere*.[86]

In summary, on-site efficiency measures, whether generation-stage or facility-use, fit comfortably within the statutory and regulatory language of the BACT definition and requirement. Regulated facilities can plainly be "subject to" on-site efficiency, just as they can "apply" on-site efficiency. Such measures are also indisputably "methods, systems, [or] techniques" that act to limit emissions of regulated pollutants from regulated facilities employing those measures. Less plainly but still arguably, regulated facilities can be "subject to" off-site, demand-side efficiency measures insofar as the facilities must implement such measures. Further, demand-side efficiency fits easily within the "methods, systems, and techniques" catchall of the BACT definition. And while demand-side efficiency measures undertaken by a given PSD-regulated facility may not reduce emissions at that very facility, the CAA and its regulations appear to require only that a pollutant *type* emitted from the facility be reduced by the emission limitation. For the foregoing reasons, the statutory and regulatory language setting forth and defining the BACT definition and requirement do not preclude the use of generation-stage, facility-use, or demand-side efficiency as BACT.

B. Impact of "Redefining the Source" Principle

Briefly, it bears discussion that EPA, the EAB, and the federal courts all hold that BACT need not include methods that would "redefine" a source—i.e., at Step 1 of the BACT process, permitting authorities need not consider alternatives that would frustrate a project's fundamental purpose and design. This should not preclude the use of efficiency as BACT, however.

EPA has long articulated its position that it does not consider BACT analysis as a "means to redefine the design of the source," for example, by requiring a permitting authority to consider a gas turbine as an alternative to a proposed coal-fired boiler.[87] EPA has stated, however, that a permitting authority is not precluded from considering alternative production processes, even if they represent significant redesigns.[88] Along these lines, the EAB has since reiterated that a permitting authority should consider a permit applicant's purpose and basic design for its proposed facility, assess which design elements are fundamental to the purpose, and in most cases, refrain from redefining that purpose.[89] A leading case on the issue is *Sierra Club v. EPA*, a Seventh Circuit decision in which Judge Posner held that the BACT analysis for a coal-burning plant located at a coal seam did not need to consider the alternative of low-sulfur coal mined elsewhere, because the plant was specifically designed to take advantage of the nearby coal.[90] Further, according to Judge Posner, it was within EPA's authority to not require consideration of source redefinitions as BACT, and within its discretion to identify the line where control technology crosses into redefinition.[91]

Turning to the respective categories of efficiency under consideration here: It would be difficult to characterize generation-stage efficiency as a redefinition of a source; by nature, such measures seek to accomplish a given energy output, just with a lower input. The same would be true of facility-use efficiency—as long as alternative production or operational processes under consideration would not alter the nature of the facility's end product, the facility's purpose would remain intact. As for demand-side efficiency, there may be arguments both ways: demand-side measures would not undermine the basic design of the source, but simply add an additional process (efficiency deployment) to the existing design; however, to the extent that demand-side efficiency might reduce a source's output, the fundamental purpose of the facility (to sell energy and earn revenue) would be undermined.

But in any event, the "redefining the source" principle is an EPA-developed one. Under Judge Posner's reasoning in *Sierra Club v. EPA*, the agency could promulgate an explicit exception for demand-side efficiency from its source redefinition policy while remaining within the statutory text. Moreover, while such EPA action may be unlikely under a Trump presidency, a state permitting authority is not precluded from considering alternatives that would change a source's design, as noted by EPA and the EAB. Hence, a state agency could act to require demand-side efficiency as BACT, even if EPA would not require it to do so.

C. Applicability of "Beyond the Fence Line" and "Generation Shifting" Debate

As noted in Part I, the Clean Power Plan ("CPP") has been stayed pending litigation in the D.C. Circuit. While the direction of this litigation is uncertain in light of Donald Trump's election, the dispute is fully briefed. Relevant here, certain legal issues facing the CPP in the litigation are closely analogous to what would be a likely basis upon which to challenge demand-side energy efficiency as BACT: whether pollution controls can be required that must be implemented off-site from the

physical source or that shift generation away from the source.[92]

The CPP relies on Section 111(d) of the CAA to direct states to implement, in the electric power sector, a GHG emissions "standard of performance"—statutorily defined as a "standard for emissions . . . which reflects the degree of emission limitation achievable through the application of the best system of emission reduction . . . [EPA] determines has been adequately demonstrated" ("BSER").[93] In the CPP rulemaking, EPA specified that BSER for GHGs would include generation-stage energy efficiency measures, along with "generation-shifting"—that is, shifting power generation from coal to gas plants, and from fossil fuel plants to renewable energy sources.[94] A state might accomplish generation-shifting by, for example, establishing a GHG intensity emission standard with tradable credits.[95] Petitioners opposing the CPP challenge it on numerous grounds, including that these generation-shifting provisions are invalid because BSER only encompasses emission reduction methods employed on-site at a regulated facility, and in a way that reduces emissions for given output.[96] As discussed below, these same bases of challenge would be relevant to demand-side BACT.

There are of course distinctions between "best available control technology" and "best system of emission reduction." They use differently worded standards; BACT is set by the permitting authority, often a state agency, while BSER is set by EPA; BACT is explicitly a case-by-case determination; and BACT must simply be "available," while BSER must be "adequately demonstrated."[97] The standards also apply to different sources, but their roles are similar. Under the PSD program, new and modified sources are "subject to [BACT] for each [applicable] pollutant"; under the CPP, state plans "establish[]" BSER "for any existing [stationary] source for any [applicable] air pollutant."[98] Both are also broad standards: BACT is achieved through the "application of production processes and available methods, systems, and techniques"; BSER is a "system of emission reduction."[99] BACT is perhaps even more broad than BSER because it includes "systems" among other equally broad terms, while BSER is limited to just "system[s]"—though the term "system" is alone quite open-ended.

EPA has agreed that "system" is an open-ended term[100]—though the CPP opponents would construe "system" at least somewhat narrowly. These challengers argue that under the CAA generally, performance standards have always been

> technological controls or low-polluting production processes that: (i) are capable of being implemented at the source, (ii) limit the individual source's emissions while it operates, and (iii) do not limit the individual source's level of production.[101]

According to this understanding, generation-shifting is generally invalid as an emission standard under the CAA (whether BSER or otherwise) because it is not implemented at the source, and because it limits a source's operating time and energy output. This understanding would also preclude demand-side efficiency as BACT, in that demand-side measures would not be implemented at the PSD-permitted source, and further, because the measures would act to reduce energy output (and therefore production) rather than reducing emissions while holding production equal. However, EPA has not dwelt on the CPP petitioners' tradition-based challenge, finding generation-shifting to fit easily within a broad reading of "system" in BSER.[102] This article concurs. The fact that a statute has been applied more narrowly does not graft in additional limitations, or preclude a statute's new, more expansive use when necessary to achieve the goals of the statute, and when within the scope of the statutory language. This reasoning should also apply to demand-side efficiency as BACT, including because BACT may, as with BSER, include emission reduction "systems."

The CPP challengers also argue that BSER may only apply to a "source" as a physical thing—and for this reason, BSER cannot include actions that an *operator* would take to meet emission limits beyond the source's physical operations (e.g., engaging in credit trading).[103] This understanding would analogously preclude demand-side efficiency as BACT. A credit-trading scheme would likely be the most effective way to implement demand-side BACT, but even if demand-side efficiency deployment was carried out directly by a source operator, the regulated source as a physical thing would not be subject to the demand-side efficiency upgrade (e.g., new equipment or a building retrofit). However, the CAA does not facially restrict the application of either BSER or BACT to a source as a physical thing. Moreover, assuming for argument's sake that BSER must apply to a source as a physical thing, the CPP challengers ignore that generation-shifting does act as a means of "emission reduction" for the physical source—that is, the reduction still applies to the source, even if the action creating the reduction/limitation is undertaken beyond the fence line.[104] The same goes for BACT: demand-side efficiency acts as a means of "emission limitation" on the energy production end, even if the efficiency mechanism operates off-site at the energy consumption end.[105]

For the foregoing reasons, demand-side efficiency as BACT may share overlapping legal vulnerabilities as generation-shifting as BSER. However, there are strong arguments that the CPP's interpretation of Section 111(d) accords with the statutory language, and likewise, that this Article's interpretation of the PSD provisions could survive analogous challenges.

Before moving on from the CPP, one final issue warrants discussion: that in the course of promulgating

the CPP, EPA had considered, but ultimately rejected, off-site energy efficiency as an element of BSER for GHGs. Demand-side efficiency had initially been proposed alongside generation-stage efficiency and generation-shifting, but was omitted from the final rule.[106] There is no indication that this rejection was motivated by a belief that the language of the CAA necessarily precludes off-site demand-side BSER where it permits (as EPA sees it) off-site supply-side BSER; or that the CAA precludes the generation reduction from a source due to lack of demand where it permits (as EPA sees it) generation-shifting from one source to another.[107] Rather, under the statutory language, EPA states only that BSER is constrained in that is must "apply to sources" and be attainable by "actions the sources themselves can implement."[108] These constraints accord with the language of Section 111(d), which provides for the "application" of BSER "for" an existing source. Relevant here, the PSD program's BACT requirement is analogous in providing that a new or modified source will be "subject to" BACT.[109]

As discussed above, however, the "subject to" requirement of the PSD regulations should not be a problem for demand-side efficiency as BACT—nor should the "apply to" requirement have been a problem for demand-side efficiency as BSER under the CPP, since demand-side efficiency measures *can* apply to, and be implemented by, sources as BACT. Indeed, the determinative reason for EPA's ultimate rejection of demand-side efficiency as BSER is not entirely clear, though it appears to have been motivated in part by concern for crossing a boundary in its statutory mandate from the regulation of air pollution to the regulation of consumer electricity use and demand.[110]

EPA was surely reasonable to consider overbroad regulation, and related litigation risk, in its final promulgation of the CPP. Yet this article challenges the notion that a line exists between supply-side and demand-side regulation under either BSER or BACT. Again, EPA has not questioned the accordance of demand-side efficiency with the statutory language of the BSER requirement. Further, where demand-side efficiency can serve to reduce air pollution (whether as BSER or BACT), it would surely serve to advance the purpose of the CAA to "promote public health and welfare by addressing air pollution"—as described and emphasized by the EPA in its justification of generation-shifting BSER.[111] For these reasons, this article disagrees with EPA that demand-side efficiency lies outside the scope of BSER—or, by extension, that it would lie outside the scope of BACT.

V. CONCLUSION

Energy efficiency will be an important piece of meaningful climate change action. The PSD program, in particular with its regulation of GHGs, provides a promising mechanism through which EPA and—especially now—state permitting authorities may require energy efficiency measures to reduce air pollution. Particularly with on-site efficiency, these measures fit snugly within the definition of BACT. But although EPA has laid promising groundwork, evidence suggests that more can be done to use BACT as a technology-forcing instrument to require stationary sources to adopt new and more stringent efficiency measures.

Furthermore, given the significant efficiency gains that can be made with greater demand-side efficiency deployment, regulators should seriously consider employing demand-side efficiency as BACT in some form, as EPA initially considered for BSER in the CPP. In particular, credit-trading schemes have worked well to reduce pollution and promote clean energy in other contexts, and may work well here too. In any event, while demand-side efficiency fits less naturally inside the definition of BACT, it arguably still fits. And while demand-side efficiency would surely face similar challenges as generation-shifting in the CPP, those challenges appear surmountable.[112]

In addition, while BSER requires EPA action, BACT is in the hands of both states—to apply on a case-by-case basis—and EPA—to promulgate regulations, provide guidance, and step in where states fail to regulate properly. Thus, both EPA and the states may play an important role in either pushing the envelope on generation-stage and facility-use efficiency as BACT, or in creating a spark for demand-side efficiency as BACT.

Endnotes

1. *See EPA Administrator Gina McCarthy, Remarks at the Energy Efficiency Forum, as Prepared*, United States Environmental Protection Agency (June 12, 2014), https://yosemite.epa.gov/opa/admpress.nsf/8d49f7ad4bbcf4ef852573590040b7f6/a367f91fca9c07d985257cf6004b89cf!OpenDocument.
2. *See generally Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units/*, 80 Fed. Reg. 64,662 (Oct. 23, 2015) (to be codified at 40 C.F.R. pt. 60) [hereinafter *CPP Rulemaking*].
3. As of this Article's writing, the CPP regulations have been finalized but are stayed pending review by the D.C. Circuit Court of Appeals. *See West Virginia v. EPA*, 136 S. Ct. (Mem) 1000 (2016). It is unclear precisely how President Trump will treat the CPP, but it does seem clear that his administration will seek to dismantle the regulations, or render them ineffectual, by some means. *See* Chelsea Harvey, *Trump Has Vowed to Kill the Clean Power Plan. Here's How He Might—and Might Not—Succeed*, Washington Post (Nov. 11, 2016), https://www.washingtonpost.com/news/energy-environment/wp/2016/11/11/trump-has-vowed-to-kill-the-clean-power-plan-heres-how-he-might-and-might-not-succeed/?utm_term=.9c5029d9d531.
4. *See generally* 42. U.S.C. §§ 7470–79.
5. EPA determined in 2009 that GHG emissions from new motor vehicles contribute to higher atmospheric GHG concentrations, driving climate change and thereby endangering human health. *Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act*, 74 Fed. Reg. 66,523, 66,537 (Dec. 15, 2009) (to be codified at 40 C.F.R. pt. 1). In 2010, EPA then issued its "Triggering Rule" suggesting that GHGs, upon regulation under the mobile source provisions of Clean Air Act, would also be subject to regulation under the PSD program. *Reconsideration of Interpretation of Regulations That Determine*

Pollutants Covered by Clean Air Act Permitting Programs, 75 Fed. Reg. 17,004 (Apr. 2, 2010). Section 165(a)(4) of the CAA provides that a PSD-regulated facility will be subject to BACT "for each pollutant subject to regulation under [the CAA] emitted from, or which results from, such facility." 42 U.S.C. § 7475(a)(4). With the Triggering Rule, EPA concluded that pollutants "subject to regulation" within the meaning of section 165(a)(4) are those pollutants that are subject to emission controls under the CAA statute or regulations. *Reconsideration of Interpretation of Regulations*, 75 Fed. Reg. at 17,007–09. Once EPA announced the anticipated GHG regulations for motor vehicles, *id.* at 25,324 (2011), GHG regulation under the PSD program was thereby triggered.

6. *Util. Air Regulatory Group v. EPA*, 134 S. Ct. 2427, 2448–9 (2014). Although the Supreme Court also held that EPA could not regulate GHGs for sources that would not otherwise be subject to PSD regulation, *id.* at 2444–6, these smaller facilities do not represent a considerable share of stationary source emissions of GHGs, *id.* at 2438–39 (noting the Solicitor General's representation that such facilities account for only three percent of U.S. stationary source GHG emissions, versus eighty-three percent from otherwise PSD-regulated sources).

7. *PSD and Title V Permitting Guidance for Greenhouse Gases*, United States Environmental Protection Agency: Office of Air and Radiation 17–46 (Mar. 2011), https://www.epa.gov/sites/production/files/2015-07/documents/gugguid.pdf [hereinafter *GHG Guidance*].

8. Although GHG regulation has brought energy efficiency to the fore as a distinct BACT option, as mentioned below, efficiency necessarily reduces emissions of any pollutants that would have resulted from any avoided emissions.

9. Specifically, the PSD provisions apply in areas in attainment with national air pollution standards for at least one pollutant for which those standards exist. *See* 42 U.S.C. § 7472(b). Nearly all areas in the country are in attainment for at least one such pollutant. *Counties Designated "Nonattainment,"* United States Environmental Protection Agency, https://www.3.epa.gov/airquality/greenbook/manpoll.html (last updated Sept. 22, 2016).

10. 42 U.S.C. § 7475(a). Note that the CAA uses the term "major emitting facility" to describe PSD-regulate sources, *see id.*, while the PSD regulations use the term "major stationary source," *see* 40 C.F.R. §§ 51.166(b)(12), 52.21(b)(12). This article uses these terms interchangeably. Furthermore, unless otherwise specified, the terms "source" and "facility" are also used to refer to PSD-regulated air emissions sources.

11. Some states administer the PSD program via their own state implementation plans under the CAA; for these states, 40 CFR § 51.166 provides the applicable federal regulations. Other states administer the federal PSD program, and follow 40 C.F.R. § 52.21. The two sets of regulations are relevantly identical.

12. 42 U.S.C. § 7475(a)(4).

13. *See supra* note 5 and accompanying text.

14. 42 U.S.C. § 7479(3). The regulatory definition is longer, *see* 40 C.F.R. §§ 51.166; 52.21(b)(12), and is discussed where relevant in Section IV.A. below. In general, state laws implementing the federal requirements are relevantly identical. *See, e.g.*, N.H. Rev. Stat. Ann. § 125-C:10-b(I)(a) (New Hampshire's statutory definition of BACT); NH ADC ENV-A 101.31 (New Hampshire's regulatory definition of BACT).

15. *See generally New Source Review Workshop Manual: Prevention of Significant Deterioration and Nonattainment Area Permitting*, United States Environmental Protection Agency (draft Oct. 1990), https://www.epa.gov/sites/production/files/2015-07/documents/1990wman.pdf [hereinafter NSR Manual].

16. *See id.* at B. 5–9.

17. *See id.* at B. 10

18. *See Alaska Dep't of Envtl. Conservation v. EPA*, 540 U.S. 461, 490–91 (2004).

19. *See infra* Part IV.

20. *See* Hank Schilling, *Energy Efficiency*, *in* Environmental Law: From Resources to Recovery 448–50 (Celia Campbell-Mohn et al. eds., 1993).

21. *See generally* U.S. EPA, Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from Coal-Fired Electric Generating Units 27–28 (2010); U.S. EPA, Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from the Petroleum Refining Industry 19–20 (2010).

22. U.S. EPA, Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from the Petroleum Refining Industry 20 (2010).

23. U.S. EPA, Available And Emerging Technologies For Reducing Greenhouse Gas Emissions From The Portland Cement Industry 21 (2010).

24. *See* U.S. EPA, Draft Greenhouse Gas Prevention of Significant Deterioration Preconstruction Permit for the Occidental Chemical Corporation, Ingleside Chemical Plant 9–21 (2014).

25. *Id.* at 18.

26. U.S. EPA, Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from the Pulp and Paper Manufacturing Industry 32 (2010).

27. U.S. EPA, Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from the Petroleum Refining Industry 21–22 (2010).

28. As stated by outgoing Energy Secretary Ernest Moniz, "I just don't see solutions to our biggest energy and environmental problems without a very strong demand-side response, and that's why it's logical to focus on energy efficiency." Speech at *2013 Energy Efficiency Global Forum*, GEF (May 21, 2013), https://www.thegef.org/events/2013-energy-efficiency-global-forum.

29. Heat retention would be most applicable as a power plant emission limitation in areas where more buildings are heated with electric power.

30. *See generally* Energy Star, https://www.energystar.gov.

31. *See infra* notes 106–111 and accompanying text.

32. *Cf. Application for HPWES Express Audit Program*, NYSERDA https://nyserda.energysavvy.com/start-your-project/hpwes-express-audit/?s=contact (last visited Apr. 30, 2016).

33. *Cf. Home Performance with ENERGY STAR,* NYSERDA, http://www.nyserda.ny.gov (last visited Apr. 30, 2016).

34. *Appliance Rebates and Offers*, Puget Sound Energy, http://pse.com/savingsandenergycenter/Rebates/Appliances/Pages/default.aspx (last visited Apr. 30, 2016).

35. *Cf.* Cash for Clunkers, http://www.cashforclunkers.org (last visited Apr. 30, 2016).

36. *Assisted Home Performance with ENERGY STAR*, NYSERDA, http://www.nyserda.ny.gov (last visited Apr. 30, 2016); *EmPower New York*, NYSERDA, http://www.nyserda.ny.gov (last visited Apr. 30, 2016).

37. *See* NSR Manual, *supra* note 15, at B. 10, 13.

38. *See GHG Guidance*, *supra* note 7, at 29 (framing energy efficiency designs and processes as within the category of inherently lower polluting technology).

39. *GHG Guidance*, *supra* note 7, at 17–46.

40. *Id.* at 29.

41. *Id.*

42. *Id.* at 29–31.

43. *Id.* at 29–30.

44. *Id.* at 30.

45. *Id.* at 30–31. The guidance does not explain why facility-use

measures should be considered only for new greenfield facilities.

46. *Id.* at 24.

47. *Id.* at 21.

48. *See generally RACT/BACT/LAER Clearinghouse (RBLC)*, United States Environmental Protection Agency, https://cfpub.epa.gov/RBLC (searchable database of BACT and other technology standard determinations) (last visited Apr. 30, 2016). "Good combustion practices," i.e., the optimization of air and fuel flow to minimize incomplete combustion, is an example of a BACT method with the dual benefits of reducing specific pollutants while improving overall fuel efficiency.

49. *See Clean Air Act Permitting for Greenhouse Gases*, United States Environmental Protection Agency, https://www.epa.gov/nsr/clean-air-act-permitting-greenhouse-gases (last visited Apr. 30, 2016) ("These papers provide basic technical information which may be useful in a BACT analysis, but they do not define BACT for each sector.").

50. In many cases, EPA has acted as the PSD permitting authority specifically for the purpose of GHG regulation, with state authorities continuing to handle other aspects of PSD permits. *See, e.g.*, 40 C.F.R. § 52.2305 (providing for federal administration of PSD permitting for GHGs in Texas).

51. U.S. EPA Region IX, *PSD Permit: Pio Rico Energy Center*, SD 11-01 7 (Feb. 28, 2014).

52. *See, e.g.*, U.S. EPA Region VI, *PSD Permit: Air Liquide Large Industries*, PSD-TX-612-GHG 7, 9–10, 12 (Nov. 21, 2013); U.S. EPA Region VI, *PSD Permit: ExxonMobil Chemical Company*, PSD-TX-102982-GHG 7–8 (Nov. 25, 2013); U.S. EPA Region VI, *PSD Permit: Rohm and Haas Texas Incorporated*, PSD-TX-1320-GHG 7 (Feb. 5,2014); U.S. EPA Region IV, *PSD Permit: Florida Power & Light Company,* PSD-EPA-4010 4 (Dec. 25, 2013); U.S. EPA Region VI, *Statement of Basis for PSD Permit: Tenaska Roan's Prairie Partners*, PSD-TX-1378-GHG 35–36 (May 2013).

53. U.S. EPA Region VIII, *Statement of Basis for PSD Permit: Sinclair Wyoming Refining Company*, PSD-WY-000002-2011.001 10 (Mar. 21, 2013).

54. U.S. EPA Region VI, *PSD Permit: Rohm and Haas Texas Incorporated*, PSD-TX-1320-GHG 8 (Feb. 5, 2014) (setting forth startup and shutdown practices for gas-fired steam boilers).

55. U.S. EPA Region VI, *PSD Permit: Rohm and Haas Texas Incorporated*, PSD-TX-1320-GHG 7–8 (Feb. 5, 2014).

56. *E.g.*, U.S. EPA Region VI, *Statement of Basis for PSD Permit: PL Propylene LLC,* PSD-TX-18999-GHG 9–11 (Apr. 2013).

57. U.S. EPA Region VIII, *Statement of Basis for PSD Permit: Sinclair Wyoming Refining Company*, PSD-WY-000002-2011.001 19-21 (March 21, 2013); U.S. EPA Region VI, *PSD Permit: C3 Petrochemicals,* PSD-TX-1342-GHG 11 (June 12, 2014) (requiring economizer in boiler design as means to preheat boiler feedwater for waste heat recovery).

58. *Compare, e.g.*, Zephyr Environmental Corporation for PL Propylene, *Application for PSD: PL Propylene* 21-22 (Dec, 2012) (setting forth proposed BACT for GHGs), *with* U.S. EPA Region VI, *Statement of Basis for PSD Permit: PL Propylene*, PSD-TX-18999-GHG 9–11 (Apr. 2013) (adopting BACT as proposed by permit applicant). *Cf.* U.S. EPA Region VI, *Statement of Basis for PSD Permit: Invenergy Thermal Development,* PSD-TX-1366-GHG 11 (Apr. 2014) (declining to impose more efficient alternative design where such alternative had not been demonstrated to meet project purpose of applicant).

59. U.S. EPA Region I, *PSD Permit: Pioneer Valley Energy Center,* 052-042-MA15 5–6 (Apr. 2012) (providing for design and installation of "energy efficient" combined cycle turbine).

60. *See* ESS Group for Westfield Land Development Company, *Application for PSD Permit: Pioneer Valley Energy Center* 3 (Nov. 24, 2008).

61. *See, e.g.*, U.S. EPA Region VI, *Statement of Basis for PSD Permit: C3 Petrochemicals,* PSD-TX-1342-GHG 16–17 (Apr. 2014); U.S. EPA Region VI, *Statement of Basis for PSD Permit: Ingleside Chemical Plant,* PSD-TX-1338-GHG 19 (Mar. 2014); U.S. EPA Region VIII, *PSD Permit: Green River Soda Ash Plant,* PSD-WY-000004-2012.001 8–9 (Jan. 27, 2014).

62. U.S. EPA Region VI, *Statement of Basis for PSD Permit: Voestalpine Texas Portland Direct Reduced Iron (DRI) and Hot Briquette Iron (HBI) Portland Production Plant,* PSD-TX-1344-GHG 13–14, 23, 28 (Apr. 24, 2014).

63. *See generally RACT/BACT/LAER Clearinghouse (RBLC)*, *supra* note 48. The RBLC is a useful place to identify permits to then track down on state agency websites, though the information contained in the database itself is often incomplete.

64. *E.g.*, Iowa Department of Natural Resources, *PSD Technical Support Document: Iowa Fertilizer Company* 12-219; Virginia Department of Environmental Quality, *Engineering Analysis: Gateway Cogeneration 1* 5–7 (Aug. 23, 2012).

65. *E.g.*, Louisiana Department of Environmental Quality, *Permit Modification Approval: Geismar Ethylene Plant* 9.

66. *E.g.*, Alaska Department of Environmental Conservation, *Preliminary Permit: Kenai Nitrogen Operations*, AQ0083CPT06 10 (Dec. 2, 2014).

67. *See, e.g.*, Illinois EPA, *Project Summary for a Construction Permit Application from Universal Cement, LLC.* 35-38 (for application received Dec. 10, 2008).

68. *E.g.*, Connecticut Department of Energy & Environmental Protection, *New Source Review Permit*: *CVP Towantic,* 144-0023 6 (Nov. 30, 2015); New Jersey Department of Environmental Protection, *Air Pollution Operating Permit: Newark Energy Center,* BOP140005 24, 26 (Nov. 1, 2012). It may also be that non-numeric limitations are provided in related agency documents not made available by the agency.

69. South Carolina Department of Health and Environmental Control, *Final Determination and Notice of MACT Approval: PyraMax Ceramics* 30 (Feb. 9, 2012) (responding to public comment suggesting that BACT analysis should consider "traffic to and from the plant and potential emissions from the use of the final products . . . by the oil and natural gas industry").

70. *Id.*

71. *Util. Air Regulatory Grp. v. E.P.A.,* 134 S. Ct. 2427, 2448 (2014). The Court's approval in *UARG* of most GHG permitting under the PSD program may also be understood as its implicit non-concern with energy efficiency as BACT, at least as understood by EPA—i.e., on-site efficiency.

72. *E.g.*, *In re La Paloma Energy Ctr., LLC*, PSDAPLPEAL13-10, 2014 WL 1066556 (ABAWQCN Mar. 14, 2014); In Re: Pio Pico Energy Ctr., 12-05, 2013 WL 4038622, at *1 (ABAWQCN Aug. 2, 2013). In these appeals, the EAB upheld the challenged BACT determinations.

73. *See* 42 U.S.C. §§ 7475(a), 7479(3); 40 C.F.R. §§ 51.166(b)(12), 52.21(b)(12).

74. 42 U.S.C. § 7479(3).

75. 40 C.F.R. §§ 51.166(b)(12), 52.21(b)(12).

76. The statutory language contains another conceivable hook with which to find BACT applicable to both on- and off-site efficiency: The statutory definition of BACT enumerates "clean fuels" as an "available method[], system[], [or] technique[]" for reducing a PSD-regulated pollutant. 42 U.S.C. § 7475(a). In a physical sense, energy efficiency is plainly not a fuel—on the contrary, it displaces fuel. But as terms of art in energy circles, "energy resource," "fuel source," and similar expressions are sometimes used to include energy efficiency among actual sources (in a physical sense) of energy. Nevertheless, where "clean fuel" is undefined in the CAA, its plain, literal meaning ought to trump a sometimes-used term of art. In the context of the Federal Power Act, the Supreme Court has recently upheld a Federal Energy Regulatory Commission

rule effectively treating certain demand-side energy conservation as a commodity sellable in wholesale energy markets. *See FERC v. Elec. Power Supply Ass'n*, 136 S. Ct. 760, 773–75 (2016), as revised (Jan. 28, 2016). While that decision allowed conservation (and by extension, efficiency as a subset of conservation) to be treated as a commodity, the Court did not rely upon any designation of conservation or efficiency as a "fuel" or "energy source." For these reasons, this article does not propose to treat efficiency as BACT on the basis of any characterization of efficiency as a "clean fuel."

77. 42 U.S.C. § 7602(k).

78. 42 U.S.C. § 7475(a).

79. 40 C.F.R. §§ 51.166(j)(2)–(3), 52.21(j)(2)–(3). In the case of a major modification, the BACT requirement applies to those "emissions unit[s]" for which emissions of a given PSD-regulated pollutant will increase as a result of the modification. 40 C.F.R. §§ 51.166(j)(3), 52.21(j)(3).

80. 42 U.S.C. § 7479(3); 40 C.F.R. §§ 51.166(b)(12), 52.21(b)(12).

81. For a discussion (and rejection) of the argument that a *facility's* application of BACT (as with on-site controls) must be understood as distinct from a facility *operator's* application of BACT (as with off-site activities), see *infra* notes 103–105 and accompanying text.

82. 42 U.S.C. § 7475(a) (emphasis added). *See also* 42 U.S.C. § 7479(3) (using essentially identical language in BACT definition).

83. *See* 40 C.F.R. §§ 52.21(j)(2)–(3), 51.166(j)(2)–(3) (requiring a regulated facility to apply BACT "for each [] regulated [] pollutant that it would have the potential to emit in significant amounts"). *See also* 40 C.F.R. §§ 52.21(b)(12), 51.166(b)(12) (defining BACT as applicable to "each [] regulated [] pollutant which would be emitted from" a regulated facility).

84. *See* Fed. Energy Reg. Comm'n, Energy Primer: A Handbook of Energy Market Basics 7–8 (2015).

85. 42 U.S.C. §§ 7475(a), 7479(3). *See also* 40 C.F.R. §§ 52.21(b(12), (j)(2)–(3), 51.166(b)(12), (j)(2)–(3) ("each regulated [] pollutant").

86. There is potential for a slippery slope problem under this reasoning. For example, could it be BACT for a PSD-regulated facility to pay for efficiency programs for energy users on an entirely different electric grid? Or to pay for efficiency improvements to vehicle engines produced by an automobile manufacturer? In either scenario, the result could still be to beneficially reduce emissions of a pollutant category that is one emitted from the PSD facility—yet the result might be difficult to square as within the scope of congressional intent. For this reason, should a regulatory authority adopt off-site efficiency as within the definition of BACT, it may be advisable for it to do so in recognition of the nexus between the regulated facility at issue and the downstream users connected to the grid into which that facility supplies energy. This would insulate the BACT determination from attack on "absurd results" grounds.

87. NSR Manual, *supra* note 15, at B. 13.

88. *Id.*; *GHG Guidance*, *supra* note 7, at 26–27.

89. *See generally In re Am. Elec. Power Serv. Corp., Sw. Elec. Power Co., John W. Turk Plant*, Petition No. VI-2008-01 (Order on Petition) (Dec. 15, 2009); In re of Cash Creek Generation, LLC, Petition Nos. IV-2008-1 & IV-2008-2 (Order on Petition) (Dec. 15, 2009).

90. *Sierra Club v. EPA*, 499 F.3d 653, 657 (7th Cir. 2007).

91. *Sierra Club*, 499 F.3d at 655.

92. *See generally* Opening Brief for Petitioners on Core Legal Issues at 29–60, *West Virginia v. EPA* (D.C. Cir.) (No. 15-1363) [hereinafter CPP Pet. Br.].

93. *See generally CPP Rulemaking*, *supra* note 2; 42 U.S.C. § 7411(a)(1) (defining "standard of performance"). Section 111(b) of the CAA directs EPA to list categories of stationary sources responsible for endangerment to public health, and accordingly, to prescribe performance standards for new or modified sources. 42 U.S.C. § 7411(b)(1)(A)–(B). Section 111(d) of the CAA requires EPA to establish regulations under which states implement plans to regulate existing sources for non-criteria pollutants that are regulated elsewhere under Section 111. 42 U.S.C. § 7411(d)(1).

94. *CPP Rulemaking*, *supra* note 2, at 64,666–67, 64,744–51.

95. *See id*. at 64,731–33. This would effectively increase the cost of GHG intensive energy sources and serve to shift more generation to cleaner sources, while also creating a disincentive for the new construction of GHG-intensive sources.

96. *See generally* CPP Pet. Br., *supra* note 92, at 41–50.

97. *Compare* 42 U.S.C. § 7479(3), *with* 42 U.S.C. § 7411(a)(1). Differences in wording aside, it is not abundantly clear what the distinction may be between the levels of stringency of the two standards: both BACT and BSER must be the best "achievable," and both must take into account cost, environmental, and energy considerations.

98. 42 U.S.C. §§ 7475(a)(4), 7411(d)(1).

99. 42 U.S.C. §§ 7479(3), 7411(a)(1).

100. *See* Respondent EPA's Initial Brief at 27, *West Virginia v. EPA* (D.C. Cir.) (No. 15-1363) [hereinafter CPP EPA Br.] ("The plain meaning of the word 'system' is expansive, encompassing 'a set of things or parts forming a complex whole' or 'a set of principles or procedures according to which something is done.' (quoting *Oxford Dictionary of English* (3d ed. 2010))).

101. CPP Pet. Br., *supra* note 92, at 8. *See also id.* at 48–50 (making argument in more detail).

102. *See* CPP EPA Br., *supra* note 100, at 26–28, 68–69.

103. CPP Pet. Br., *supra* note 92, at 43–45.

104. *Id.* at 61–64.

105. *See supra* notes 80–81, 85–86 and accompanying text.

106. *CPP Rulemaking*, *supra* note 2, at 64,778–79.

107. *See id.*

108. CPP EPA Br., *supra* note 100, at 28 (citing *CPP Rulemaking*, *supra* note 2, at 64,778–79).

109. 42 U.S.C. § 7411(a)(1), (d)(1); 42 U.S.C. § 7475(a)(4).

110. *See id.* Whether EPA or state permitting agencies should share similar concerns with respect to demand-side efficiency as BACT is beyond the scope of this article.

111. CPP EPA Br., *supra* note 100, at 6 (citing 42 U.S.C. § 7401(b)(1)); *see also id.* at 3, 22, 44, 51 (invoking congressional purpose and intent as support for EPA's interpretation of Section 111(d)).

112. The CPP litigation may or may not resolve on the merits, such that some of the questions discussed in Section IV.C. herein would be answered by the courts.

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