UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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Carbon Pollution Standards for	)	**Docket No. EPA–HQ–OAR–2013–0603,**
Modified and Reconstructed	)	
Stationary Sources: Electric Utility	)	*Via email*
Generating Units; Proposed Rules	)	*October 16, 2014*
	)	

Thank you for accepting these comments on EPA's proposed Carbon Pollution Standards for Modified and Reconstructed Stationary Sources: Electric Utility Generating Units; Proposed Rules (or the "modified/reconstructed rule"), 79 Fed. Reg. 34,960 (June 18, 2014). We submit these comments on behalf of the Sierra Club and the National Wildlife Federation. We are submitting this document concurrently with a separate comment letter jointly submitted by the Sierra Club, the Environmental Defense Fund, the Natural Resources Defense Council, Earthjustice, Clean Air Task Force, and the National Wildlife Federation.[1]

I. Introduction

EPA's proposed modified/reconstructed rule is a key part of the trio of critical regulatory actions implementing the agency's authority under the Clean Air Act (or simply "the Act") to restrict carbon dioxide ("CO_2") emissions from fossil fuel-fired electric generating units ("EGUs"). EPA first proposed new source performance standards ("NSPS") under section 111(b) of the Act that would limit CO_2 emissions from new coal-fired power plants based on partial carbon capture and sequestration ("CCS") technology ("the new source rule"). EPA then proposed emission guidelines under section 111(d) of the Clean Air Act that would require states to develop implementation plans that limit CO_2 emissions by improving the operational efficiency of existing coal-fired EGUs and that, as a practical matter, would restrict generation at these units, encourage their early retirement, and provide substantial incentives for investment in new renewable energy resources and demand-side energy efficiency programs. These proposals are an important step in reducing the pollution that causes climate change. However, we believe EPA should improve and strengthen them when it issues the final rules. The Sierra Club and the National Wildlife Federation have provided detailed comments[2] with our environmental partners in support of the proposed new source rule and anticipates

[1] In these comments, we address certain aspects of EPA's proposed emission guidelines under section 111(d) insofar as they directly affect the modified/reconstructed rule proposal. We plan to submit a comprehensive set of comments on the 111(d) proposal before the December 1, 2014 deadline. As such, our statements in this document regarding the 111(d) proposal do not to represent the full scope of our comments and opinions on that matter, but only those aspects of it that relate directly to the modified/reconstructed rule proposal.

[2] *See* Sierra Club, et al., *Comments on Standards of Performance for Greenhouse Gas Emissions from New Stationary Sources: Electric Utility Generating Units*, EPA-HQ-OAR-2013-0495-9514 (May 9, 2014) (hereafter, "Comments on the Proposed New Source Rule"). This comment letter is attached as **Ex. 1** and is incorporated by reference herein.

commenting on the 111(d) Clean Power Plan in advance of the December 1, 2014 deadline. Below, we discuss various measures EPA should take to strengthen the modified/reconstructed rule and ensure that its suite of carbon pollution regulations is maximally effective.

II. A Strong, Legally Robust Standard is Necessary to Avoid Life-Extension Projects and Sham Modifications at EGUs

EPA's proposals to curb carbon pollution from power plants are in the public interest and may, in fact be achieved at little or no net cost to ratepayers. Nevertheless, companies that own or operate fossil fuel-fired EGUs have publicly opposed EPA's efforts to reduce CO_2 emissions from these sources. If the proposals for new and existing EGUs are adopted essentially as proposed, it is reasonable to assume that some owners may seek to extend the useful life of existing fossil fuel-fired plants through modification and/or reconstruction of those units. Since EPA's current regulations under section 111 define modified and reconstructed units as "new" units, while state 111(d) plans apply to existing plants, some owners, and perhaps some states, will assert that modified or reconstructed units may not be covered under state 111(d) plans, even if those facilities were included in such plans prior to modifying or reconstructing. Unconstrained, these options would open "vistas of indefinite immunity"[3] that could allow existing coal-fired power plants to escape both the CCS-based limits of the proposed new source rule as well as the limitations of the proposed 111(d) emission guidelines.

Furthermore, adopting separate modified and reconstructed source standards that are less stringent than the new source standard encourages sources not only to extend their useful lives, but also to claim that they are no longer existing sources subject to section 111(d) plans. EPA's proposal would existing sources that are subject to requirements under an approved 111(d) state plan, and then modify or reconstruct, to remain covered under that plan.[4] We support the policy objectives of discouraging life extension programs and sham modifications undertaken to escape coverage under section 111(d) plans. However, EPA also proposes to require that sources that modify or reconstruct *prior* becoming subject to a state 111(d) plan merely satisfy a variant of Building Block 1 of the 111(d) emission guidelines. Moreover, EPA does not explain why it proposes to depart from its earlier precedent, in which sources that modify or reconstruct after the effective date of a state 111(d) plan are removed from coverage under that plan and are regulated instead under the agency's new source standard.[5] The

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[3] *Wisc. Elec. Power Co. v Reilly ("WEPCO")*, 893 F.2d 901, 909 (7th Cir. 1990).

[4] EPA's proposal would not require sources to participate in a state plan if those sources modified or reconstructed prior to becoming subject to the plan, determined by "the date that the plan is initially submitted to the EPA." 79 Fed. Reg. at 34988. Our suggested performance standard for both modified and reconstructed units would apply regardless of the date when the relevant state plans are submitted, approved, or adopted.

[5] For example, in its emission guidelines for existing small municipal waste combustion units, EPA instructs that "[i]f an owner or operator . . . makes changes that meet the definition of modification or reconstruction after June 6, 2001 for subpart AAAA of this part, the municipal waste combustion unit becomes subject to subpart AAAA of this part [i.e., the 11(b) new source standard for small municipal

agency refers commenters to its Legal Memorandum Technical Support Document ("TSD") for an explanation of the basis for this change, but the referenced memorandum does not address this issue in any detail,[6] although the preamble for the proposed Clean Power Plan[7] does discuss the Act's silence on the question of whether existing sources remain subject to a state 111(d) plan after modifying or reconstructing and the need for *Chevron* deference on this issue. *See* 79 Fed. Reg. 34,830, 34,904 (June 18, 2014). This legal ambiguity suggests that state or industry parties may challenge EPA's interpretation in court, and we discuss below some options EPA may take to reduce its legal risk in the issue.

EPA's proposed new source rule does not ban all new coal-fired generation, but the agency notes that little or no new coal-fired generation is anticipated even in the absence of a strong performance standard; thus, EPA proposes that the few new coal-fired power plants expected to be constructed in the coming years must employ partial CCS. As a practical matter, this proposed new source rule effectively limits new coal-fired EGUs to those locations where CO_2 can be transported to sequestration sites.[8] We agree with this approach: EPA's proposed level of regulation is not only authorized, but is essential if the threat of climate change is to be abated. Moreover, the concept that emission limitations under the Clean Air Act may impose practical restrictions on the location of new, and also reconstructed, and modified sources is not new. More stringent emission limitations in nonattainment areas were intended by Congress to limit, and in many instances ban, the construction new large emission sources in those areas. Similarly, emission limitations that require large pollution control devices, such as flue gas desulfurization ("FGD"), selective catalytic reduction ("SCR"), electrostatic precipitators ("ESP"), or fabric filters ("bag houses") require larger sites and effectively preclude development of new EGUs in urban areas.[9]

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waste combustors] and the State plan no longer applies to that unit." 40 C.F.R. § 60.1550(b). Analogous provisions appear in the emission guidelines for existing solid municipal waste landfills (*id.* § 60.33c(d)(1)), commercial and industrial solid waste incinerators (*id.* § 60.2550(b)), and sewage sludge incinerators (*id.* § 60.5060(b)).

[6] *See* EPA, Legal Memorandum for Proposed Carbon Pollution Emission Guidelines for Existing Electric Utility Generating Units (June 2014), available at http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule-legal-memorandum.

[7] EPA asserts that it does not have sufficient information about where reconstruction projects might be located or costs at specific plants, but such information is unnecessary and is also not available with respect to hypothetical new plants.

[8] To the extent that EPA plans to allow sequestered CO_2 from power plants to be used in enhanced oil recovery ("EOR") operations, we urge the agency to evaluate the CO2 emissions associated with the entire life cycle of power generation and downstream processing of the oil produced through EOR. An analysis of this nature is critical in order to understand whether these additional emissions would offset the reductions targeted under either the proposed new source rule or the modified/reconstructed rule. For more discussion, *see* Sierra Club, *Comments on EPA's Standards of Performance for Greenhouse Gas Emissions from New Stationary Sources: Electric Utility Generating Units*, EPA-HQ-OAR-2013-0495-9513 (May 9, 2014), attached as **Ex. 2**, at 2-5**.**

[9] Compliance with National Ambient Air Quality Standards ("NAAQS") also tends to disfavor new EGUs in urban locations and in areas where attainment status may be at risk.

EPA has not identified a sufficient rationale why the same determination of the best system of emission reduction ("BSER") for new sources—efficient generating technology with partial CCS—is not within the agency's authority under the Clean Air Act to regulate modified and reconstructed coal-fired EGUs. Modified and reconstructed sources are considered new sources under the Act, and have historically been treated as such. It may be that not all sources at all current locations could meet the new source standard in a cost-effective way if they were modified or reconstructed, but this has always been true for these types of sources. As EPA acknowledges and as we discussed at length in our earlier comments on the proposed new source rule, EPA is not required to set the new source standard at a level that all sources can meet. Yet, the agency's modified/reconstructed rule proposal suggests a view that existing source operators have a right to modify their units irrespective of the public interest and that the limits for modified units must be set at cost-effective levels for all units whose owners might elect to modify. Such a view is neither sound public policy nor a reasonable reading of the law. When faced with a claim that complying with the new source standard would be prohibitively expensive, the Sixth Circuit in *Nat'l-Southwire Aluminum Co. v. EPA*, 838 F.2d 835, 841 (6th Cir. 1988) noted that the operator had a choice –comply with the more stringent limitation, or simply not modify the unit—*and that either of those options would further the Act's stated purpose*.[10]

Modifications and reconstructions of existing units under the NSPS program have been rare and would not be expected to occur in the future, except for the potential for source operators to "game" the proposed rules. The impact on national electricity prices associated with applying the proposed standard for new sources to reconstructed and modified sources as well cannot therefore be assumed to be significantly different from that assumed by EPA in the in the new source rule. Accordingly, there is no reason to apply a lesser standard to modified or reconstructed units, as the agency proposes to do in the modified/reconstructed rule. There is nothing that compels an operator to increase the hourly emissions from a source or to invest 50 percent of the cost of a comparable new unit in an aging facility. Congress has expressed, and the courts have recognized, a policy determination that the grandfathered status of existing facilities is not intended to be indefinite. *See, e.g.*, WEPCO, 893 F.2d at 909. Given the very small incremental generation from such modifications and reconstructions and the available alternatives, it cannot be said that there is a strong public policy benefit to be derived from providing a lesser standard for modified and reconstructed units. Indeed, Congress and the Courts have recognized that the most opportune time to install pollution controls is when a unit is being constructed or modified. *WEPCO* is instructive here as well:

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[10] *See Nat'l-Southwire Aluminum Co.,* 838 F.2d at 841 ("The EPA's determination will require NSA either to continue operating its existing wet scrubbers (and thereby avoid application of the NSPS) or to install new control equipment. If, as NSA claims, the latter option is prohibitively expensive, then presumably the company will choose the former option. In contrast to NSA's proposed plan permitting vastly *increased* fluoride emissions, either of the above options will further the Act's stated purpose of protecting and enhancing the quality of the nation's air by virtue of increased federal participation.")

> Consistent with its balanced approach, Congress chose not to subject existing plants to the requirements of NSPS and PSD. Members of the House recognized that "[b]uilding control technology into new plants at time of construction will plainly be less costly then [sic] requiring retrofit when pollution control ceilings are reached." H.R. Rep. No. 294, 95th Cong., 1st Sess. 185, reprinted in 1977 U.S. Code Cong. & Admin .News at 1264. But Congress did not permanently exempt existing plants from these requirements; section 7411(a)(2) provides that existing plants that have been modified are subject to the Clean Air Act programs at issue here. As Judge Boggs, dissenting in *National-Southwire*, reasoned: "The purpose of the 'modification' rule is to ensure that pollution control measures are undertaken when they can be most effective, at the time of new or modified construction." *Id.*

To ensure the benefits of its proposals respecting new and existing coal-fired generation, EPA must firmly and securely close the potential loopholes associated with life extension programs and sham modifications intended to avoid coverage under state 111(d) plans. Toward that end, the agency should require that reconstructed units meet the proposed new source standard. EPA should also ensure that the standard for modified units is significantly more stringent than that for existing units. One approach is to subject these units to the 111(b) standard for new sources, an option that is clearly authorized under prior agency practice as well as technically justified under the agency's rationale for its BSER determination under the proposed new source rule.

Under another approach, EPA might impose a substantially more stringent BSER for modified units than for existing units. As proposed, the stringency of the modified source standard depends on such sources remaining subject to a 111(d) plan. Unless emissions from modified sources remain in EPA's calculation of the state-wide goals under its 111(d) emission guidelines and each modified source is required to comply with an existing state plan, the individual limits proposed by the agency are less stringent for modified units than for unmodified existing units. If a Court were to hold that modified sources may not, or need not, be regulated under state 111(d) plans, modified units would not be subject to the BSER limits that reflect the application of Building Blocks 2, 3, and 4 of the proposed 111(d) emission guidelines.

EPA should put industry on notice, as it did under the Clinton Administration, that the agency will no longer ignore life extension programs that continue to defy Congressional intent almost 50 years after the passage of the Act. Congress intended the NSPS and New Source Review ("NSR") programs to work in tandem to continually drive pollution control technology forward and ratchet down emissions, and EPA should implement these programs in a way that maximizes their effectiveness at reducing greenhouse gas emissions. EPA and the Obama Administration should seek to reverse the enforcement budget cuts of recent years and commence rulemakings to correct the prior Administration's assault on the New Source Review ("NSR") program. Finally, EPA should revisit its timid and technically unsound approach to Best Available Control Technology ("BACT") determinations for greenhouse gas emissions under the

NSR program.[11] EPA's BACT decisions respecting load-following gas-fired units have sent a clear signal that the agency does not intend to enforce the NSR BACT rules in any meaningful way for greenhouse gas emissions. EPA must reverse this perception if it hopes to avoid a proliferation of life extension projects. Operators of sources that choose to modify or reconstruct under the NSPS program should be aware that the agency will closely monitor such modifications for compliance with the law and that there is a very real possibility that BACT for such changes under the NSR program may well include partial CCS technology.

III. Detailed Comments on Performance Standards for Modified and Reconstructed Steam EGUs

A. The Relationship Between Sections 111(b) and 111(d) of the Clean Air Act

EPA asserts in the preamble to the proposed modified/reconstructed rule that "all existing sources that become modified or reconstructed sources and which are subject to a [Clean Air Act] section 111(d) plan at the time of the modification or reconstruction, will remain in the . . . section 111(d) plan and remain subject to any applicable regulatory requirements in the plan, in addition to being subject to regulatory requirements under . . . section 111(b)." 79 Fed. Reg. at 34,963. The agency discusses this in more detail in the preamble to the proposed 111(d) emission guidelines, released concurrently with the modified/reconstructed rule proposal, which states that "[b]ecause [Clean Air Act] section 111(d) does not address whether an existing source that is subject to a . . . section 111(d) program remains subject to that program even after it modifies or reconstructs, the EPA has authority to provide a reasonable interpretation, under the Supreme Court's decision in *Chevron U.S.A. Inc. v. NRDC*, 467 U.S. 837, 842–844 (1984)." 79 Fed. Reg. 34,904. In order to ensure the integrity of the 111(d) program and dissuade sources from avoiding their 111(d) obligations by making modifications or reconstructions, EPA has used its discretion to interpret the statute such that existing plants that are subject to a section 111(d) plan remain within that plan's authority even after they modify or reconstruct. *Id.*

As noted above, we agree with EPA's policy judgment that it must ensure that any state plan issued under section 111(d) must achieve equal environmental results regardless of the number of units that modify or reconstruct during the compliance period under the plan. We also agree that plant owners or operators must not have any regulatory incentive to modify or reconstruct their units, such that their post-modification obligations for either that plant or any suite of plants they may own are less stringent than were their pre-modification obligations. And, as EPA notes, the Clean Air Act does not address the specific question of whether a 111(d) plan may or may not encompass existing units that have modified or reconstructed.

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[11] As the Supreme Court recently held, while CO_2 emissions from stationary sources cannot trigger obligations under the NSR/PSD program, sources are still subject to BACT for their CO_2 emissions if their criteria pollutant emissions otherwise trigger NSR/PSD obligations. *Utility Air Reg. Grp. v. EPA*, 134 S.Ct. 2427, 2440-49 (2012).

Furthermore, the statute does not address whether a performance standard that applies to a particular source at one period in time ceases to apply if that standard modifies or reconstructs.

However, EPA has, in similar rules, determined that modified sources are new sources that are not to be included in state section 111(d) plans.[12] The agency is entitled to change its view based on the differences in the administrative record in this rulemaking, but a reviewing court may decide that the agency is entitled to less deference for its changed interpretation. We believe that EPA can achieve its intended outcome by directly applying the four 111(d) building blocks to modified units. We discuss this option in the sections below, in which we propose BSER determinations and performance standards for steam EGUs.[13] Specifically, we propose a set of standards that should apply in the event that a state decides not to include modified units in its program, or if a court holds that a state may not include modified units in its 111(d) plan.

B. Performance Standards for Reconstructed EGUs

1. Reconstructed Units Should Be Required to Meet the Standards Proposed in EPA's New Source Standard Under Section 111(b)

For reconstructed steam EGUs, EPA has determined that BSER is "the most efficient technology at the affected source." 79 Fed. Reg. at 34,962. The corresponding performance standard the agency proposes to establish is 1,900 lb CO_2/MWh (net) for units with a maximum heat input greater than 2,000 MMBtu/hr and 2,100 lb CO_2/MWh (net) for units with a maximum heat input below that threshold. Under any reasonable evaluation, this standard is far too lenient. Indeed, many existing coal-fired EGUs already meet these emission limits, whereas the purpose of the NSPS program is to advance the technological vanguard, not entrench the status quo. EPA must ensure that reconstructed EGUs satisfy a performance standard that is both sufficiently rigorous and technologically forward-looking.

Our proposal for reconstructed sources is the application of the 111(b) new source standard. We refer EPA to our coalition comments for the agency's proposed new source rule, attached as Exhibit 1 and incorporated by reference herein, for a detailed discussion of the issue. In keeping with the proposed new source standard, EPA should designate efficient generation technology with partial CCS as BSER for reconstructed steam EGUs and should impose a performance standard at least as stringent as 1,200 lbs CO_2/MWh on a net output basis. We discussed the technical and legal basis for this standard in our comments on the proposed new source rule[14] and need not repeat that in detail here. Simply put, partial CCS is economically feasible and technologically achievable for reconstructed units and should be mandated for all such facilities.

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[12] *See* n. 5, *supra.*

[13] We discuss performance standards for modified and reconstructed stationary combustion turbines in our coalition comments for the proposed modified/reconstructed rule, which are being submitted concurrently with this comment letter.

[14] *See* Comments on the Proposed New Source Rule at 31-33, 73-83.

As noted previously, the agency regularly establishes identical performance standards for new and reconstructed units. In fact, we contend that EPA lacks statutory authority to distinguish between reconstructed and newly EGUs for NSPS purposes. Section 111(b) directs the agency to issue emission standards for sources that undergo "modification" or "construction." 42 U.S.C. 7411(a)(2), (b)(1)(B). In 1975, EPA interpreted the term "construction" to include reconstructions, i.e., projects that are "substantially equivalent to totally replacing [an affected facility] at the end of its useful life with a newly constructed affected facility." *See* 40 Fed. Reg. 58,416, 58,417 (Dec. 16, 1975). EPA was surely correct that section 111's use of the term "construction" authorizes regulation of sources that are "substantially equivalent" to newly constructed sources. Having determined that reconstructed sources are substantially equivalent to newly constructed sources for jurisdictional purposes, however, the agency cannot then distinguish between reconstructed sources and newly constructed sources without a technologically compelling reason to consider them separate "classes" or "types" under section 111(b)(2). EPA has supplied no such reason, and there is none from a technological, economic, or environmental standpoint. In fact, the policy rationale for limiting coal-fired generation to those locations where partial CCS is feasible is at least as strong for reconstructed existing units as it is for brand new units. Hence, the agency must require partial CCS at reconstructed steam EGUs.

We also emphasize that the risk of life extension projects is particularly acute with regard to reconstructed sources. EPA has defined these projects as units whose capital costs are 50 percent of the cost of a comparable entirely new facility. *See id.* § 60.15(b)(1). The 50 percent figure is far too high, as evidenced by the WEPCO projects. Those projects are the prototype of major plant life extension projects and involved a massive rebuilding of the Port Washington plant, including replacement of major components such as the steam drums and reheaters. Yet even this rebuild did not trigger the 50 percent reconstruction threshold under the NSPS program. *See WEPCO*, 893 F.2d at 912-13. EPA should reduce the threshold to levels below those demonstrated in the WEPCO and other life extension projects that were the subject of EPA enforcement actions. A range of 10 to 25 percent should be more than sufficient to allow existing power plants to run for another 10 years without triggering the obligation to comply with the standard governing new sources. By 2028, approximately two-thirds of the existing fleet (in terms of total generation supplied) will be more than 50 years old.[15] Those units should be retired, not rebuilt.

Reconstructed units have historically been extremely rare. We see little reason why a plant operator would choose to undergo such a project if not for the express purpose of artificially extending the life of an aging plant rather than constructing a new facility that would be subject to a rigorous new source standard. This scenario is not in keeping with the goal or

[15] These data were derived from an analysis of EPA's AMPD data. *See also* EPA, *Clean Power Plan Goal Computation Technical Support Document*, Docket ID No. EPA-HQ-OAR-2013-0602 (June 2014), Appendix 7: Unit Level Inventory ("111(d) Unit-Level TSD"), *available at* http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule-technical-documents.

purpose of the Clean Air Act, and the statute grants EPA the tools to ensure that it does not occur. The agency must therefore utilize the tools at its disposal and prevent environmentally harmful life extension projects by adopting our proposal for reconstructed steam EGUs.

2. EPA Must Eliminate the Source-Specific Feasibility Carve-Out for Reconstructed Units

Under the current 111(b) regulations, EPA makes case-by-case determinations regarding the applicability of the standard for reconstructed sources based on feasibility. Whereas the new source standard applies to each and every newly constructed unit, a "reconstructed source" is only defined as such if "[i]t is technologically and economically feasible to meet the applicable standards set forth in this part." 40 C.F.R. § 60.15(b)(2). In effect, the definition of "reconstructed source" includes a safety valve to ensure that no project will trigger a reconstructed source performance standard if that standard is not technologically or economically feasible at that source in question. This provision creates a highly problematic loophole, since it incentivizes any source operator wishing to reconstruct a unit to argue that it is not feasible for that particular source to meet the standard, regardless of whether or not that is actually the case. Furthermore, reconstructed units are merely a sub-category of new units, and there is no legal basis to create a special carve-out for reconstruction projects for which an otherwise valid standard of performance is not feasible when no such carve-out exists for new sources.

As discussed above, EPA must generally treat new and reconstructed sources identically under the statute, and the agency has not and cannot justify the special carve-out for reconstructed units. Furthermore, the logic of *Nat'l-Southwire Aluminum Co.* is equally relevant to reconstructed sources as it is to modified units: if a source operator finds that it is not feasible to reconstruct the facility *and* meet the applicable performance standard, it has another option—simply not reconstruct the unit. *See* 838 F.2d at 841. We therefore urge the agency to use its regulatory authority to redefine "reconstructed units" for the purpose of this rule so as to exclude the unit-specific feasibility carve-out, and, in a separate rulemaking, to repeal the carve-out for *all* NSPS.

C. Performance Standards for Modified EGUs

1. EPA's Position on Modified Units Underestimates the Potential for Efficiency Improvements

Under EPA's proposed modified/reconstructed rule, EPA has determined that BSER for modified coal plants includes two components: best operating practices, which includes both operating the unit in the most efficient manner for a given operating condition and replacing worn components in a timely manner; and equipment upgrades, which involve replacing existing components with upgraded ones or a more extensive overhaul of major equipment (such as turbines or boilers). *Id.* at 34,964. The agency's performance standard based on this BSER is, for each modified steam EGU, a unit-specific emissions limit determined by that plant's

best historical annual CO_2 emission rate from 2002 to the date of the modification, plus an additional 2 percent emission reduction. However, the proposed rule specifies that no unit with a maximum heat input greater than 2,000 MMBtu/hr would be required to meet a standard more stringent than 1,900 lbs CO_2/MWh (net), or 2,100 lbs CO_2/MWh (net) for units with a maximum heat input below that threshold. As noted above, these units would remain subject to any applicable state plan under section 111(d) regardless of modification.

As discussed above, in the event a court found that existing units that undergo modifications cannot remain subject to the requirements of the a (d) plan, EPA's proposal would be far less stringent than the proposed emission guidelines for unmodified existing units. Even if these sources are retained in 111(d) plans, modifications that extend the life of 50-year-old plants should be discouraged by stringent 111(b) obligations. EPA has provided no adequate rationale for not applying the new source standard, nor has it sufficiently justified its rejection of other BSER options for modified steam EGUs, including the use of combined heat and power (CHP), hybrid power plants, and reductions in generation associated with dispatch changes, renewable generation, and demand-side energy efficiency.

We recommend that the "Block 1" component of BSER for existing units be based on each plant's lowest rolling 365-operating day average, for the period spanning from 2001 to 2012, plus an additional four percent emissions reduction. Applying a rolling 365-operating day average provides for an ample averaging period to address uncontrollable variability in plant operations without the artificial constraint of a calendar year. EPA, the Department of Energy/National Energy Technology Laboratory ("DOE-NETL"), and others have recognized that a four percent improvement in heat rate (which corresponds to an efficiency improvement of less than 1.5 percent) is achievable through capital improvements such as turbine blade replacements, leak reductions, and fan upgrades. In its proposed 111(d) emission guidelines, EPA declined to adopt the four percent value for all existing units under the rationale that at least some existing units have undertaken at least some of these upgrades, while acknowledging that its selection of a two percent heat rate improvement under Building Block 1 was conservative. *See* 79 Fed. Reg. at 34,988

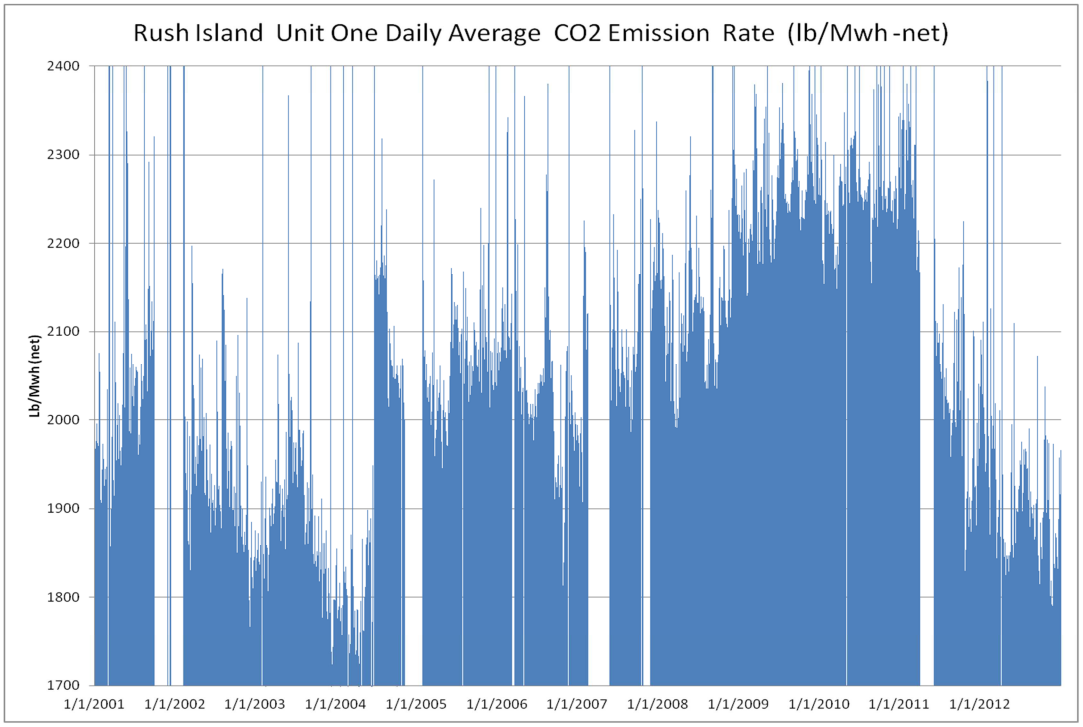
A capital intensive modification that increases the emissions of an NSPS-regulated unit is and should remain rare; if such an investment is warranted because of the value of the unit, the modifying unit should incorporate the full suite of available efficiency improvement options. The record does not support any threshold emission rate for existing units below which efficiency improvements are no longer feasible. EPA's unit-level emission data set included in its 111(d) Goal Computation TSD contains at least 25 coal-fired EGUs with reported emission levels of less than 1,900 lbs CO_2/MWh (net),[16] and many more smaller units with emission rates below 2,100 lbs CO_2/MWh (net), belying any notion that emission limits of 1,900 and 2,100 lbs CO_2/MWh represent a technological barrier for efficiency in existing units. Data maintained by EPA's Air Markets Program Division ("AMPD") confirms that efficiency improvements below

[16] These data are available in EPA's 111(d) Unit-Level TSD; *see* n. 15, *supra*.

1,900 lb CO_2/MWh (net) are readily achievable.[17] Below, we provide two of the dozens of examples that can be found in EPA's data to illustrate this point. The agency has the means to evaluate these data fully and make a determination based on actual evidence rather than an unsupported, generalized assumption.

Rush Island Unit One, a coal-fired EGU in Missouri, reported an annual average emission rate of 1,884 lbs CO_2/MWh in 2012, but AMPD data show that this unit achieved a rolling 365-day average emission rate of 1,810 lbs CO_2/MWh in 2004. Notably, the improved emission rate in the 2004 timeframe was not preceded by a lengthy outage and a sharp decline in emission rates, suggesting that the improvement was not the result of a single large "modification."[18] The steady decline in performance in the 2008-2011 timeframe occurs during a period when no maintenance outages were conducted. These data support EPA's determination that efficiency improvements can be achieved with better attention to operation and maintenance of existing units, even at the best performing existing units. Further improvements are available if capital projects, such as those identified by the DOE/NETL, are made.[19]

Table 1. Daily Emission Rates at Rush Island Unit One, 2001-2012



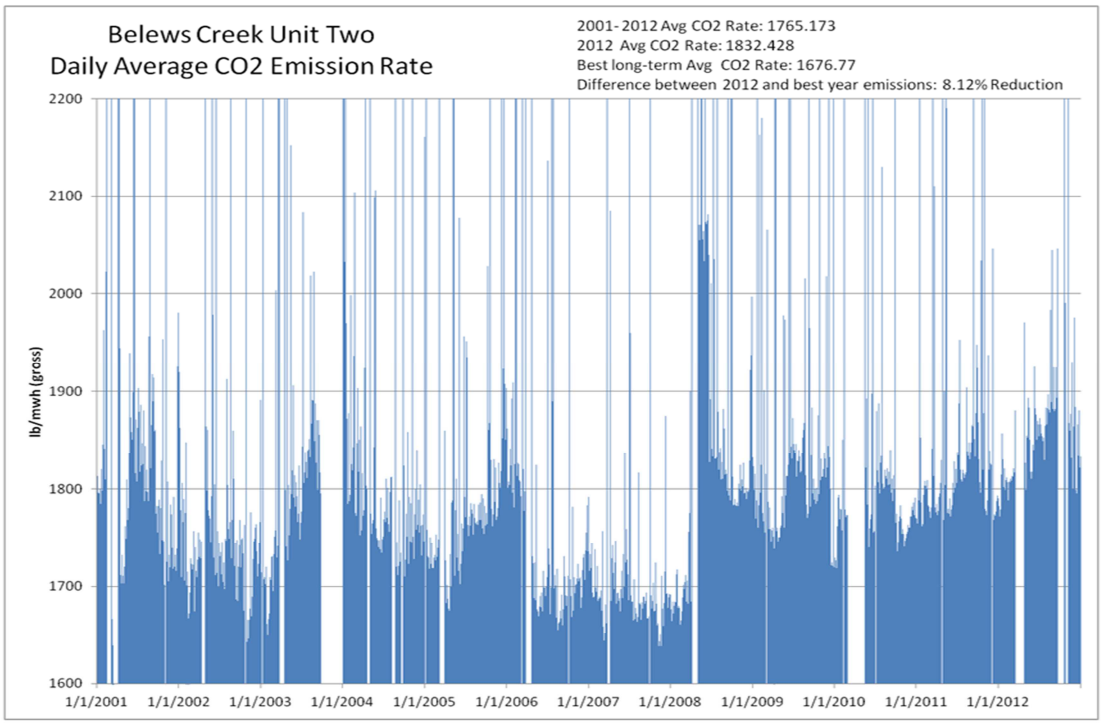
[17] AMPD data are maintained in terms of gross electrical output. Conversion from gross electric output to net electric output was based on ratio of the reported 2012 annual emission rate (in net output) in EPA's TSD and the 2012 output emission rate (in gross output) in the AMPD data set.

[18] Furthermore, no significant improvement in emission rate is apparent following the 2005 and 2007 outages of this unit.

[19] *See* DOE/NETL, *Options for Improving the Efficiency of Existing Coal-Fired Power Plants*, DOE/NETL-2013/1611 (April 1, 2014), attached as **Ex. 3**.

The data for Belews Creek Unit One, a coal-fired plant in North Carolina, similarly document the fact that significant emission improvements can be made at units with reported emission rates below 1,900 lbs CO_2/MWh. EPA's TSD reports the 2012 annual average emission rate for this unit as 1,866 lbs CO_2/MWh. The long term daily averages obtained from the AMPD database show an outage spanning March 25 to April 21, 2006, followed by a significant reduction where the low rolling 365-day average emission rate is more than eight percent below than the 2012 annual average.[20] In 2008, an FGD was installed at Belews Creek, increasing parasitic loads and reducing its efficiency. Nevertheless, the plant operator managed to achieve an emission reduction of more than 8 percent in 2006 on a unit whose emissions were less than 1,900 lbs CO_2/MWh. Had the 2006 efficiency upgrade followed installation of the FGD, an eight percent reduction from the post-FGD emission rate would still have been observed. In other words, even the most lowest-emitting coal plants can achieve substantial efficiency improvements simply by following best operating and maintenance practices.

Table 2. Daily Emission Rates at Belews Creek Unit Two, 2001-2012



2. Modified Units Should Be Required to Meet the Standards Proposed in EPA's New Source Standard Under Section 111(b)

Regardless of whether EPA ultimately determines that modified coal plants remain subject to the 111(d) plan, the agency should establish a performance standard for these units

[20] *See* 111(d) Unit-Level TSD, n. 15, *supra*. We have not attempted to convert the data in the graph from a gross output basis to a net output basis because of concerns that the relationship changed over time with installation of its FGD.

that reflects the same BSER determination it made for new steam EGUs: highly efficient boiler models equipped with partial CCS technology, which would reduce CO_2 emissions by 30 to 50 percent relative to similar units without CCS systems. *See* 79 Fed. Reg. at 1435. In the proposed new source rule, EPA established a performance standard of 1,100 lbs CO_2/MWh for such units on a gross-output basis. In our coalition comments, we discussed that the agency should instead rely on a net output- rather than gross output-based standard. As such, we proposed that the actual best performance of an efficient coal-fired unit equipped with partial CCS is 1,200 lbs CO_2/MWh.[21] We now propose that modified steam EGUs be required to meet this standard as well.

Our proposal that EPA should require modified steam EGUs to meet the same standard as new units is based on strong historical precedent. Since the advent of the NSPS program, EPA has frequently made identical BSER determinations, and established the same standards of performance, for new, modified, and reconstructed units alike within a regulated category. Indeed, EPA has done so in this very rule proposal for stationary combustion turbines, and (with small exceptions) the current NSPS regulations for steam EGUs covering criteria pollutants apply equally to new, modified, and reconstructed sources that otherwise meet the applicability specifications. *See* 40 C.F.R. § 60.40Da(a)(2), 60.42Da-60.45Da. In many other industrial categories, most or all of the performance standards do not distinguish between new, modified, and reconstructed units, including industrial boilers (40 C.F.R. §§ 60.40Db(a)-(b)), 60.40c(a)), municipal waste combustors (*id.* §§ 60.50a(a)), 60.50b(a)), petroleum refineries (*id.* § 60.100(a)-(d)), petroleum storage vessels (*id.* §§ 60.110, 60.110a), volatile organic compound storage vessels (*id.* § 60.110b(a)), industrial surface coating facilities (*id.* § 60.720(a)-(b)), mineral calciners and driers (*id.* § 60.730(a)-(b)), and many others.

Similarly, many categories include the same performance standards for new and modified units without referencing reconstructed units (which, in most instances, had not yet been given a specific regulatory definition). These include nitric acid plants (*id.* § 60.70a(b)), sulfuric acid plants (*id.* § 60.80(b)), hot mix asphalt facilities (*id.* § 60.90(b)), sewage treatment plants (*id.* § 60.150(a)-(b)), primary copper smelters (*id.* § 60.160(a)-(b)), primary zinc smelters (*id.* § 60.170(a)-(b)), primary lead smelters (*id.* § 60.180(a)-(b)), primary aluminum reduction plants (*id.* § 60.190(a)-(b)), sources in the phosphate fertilizer industry (*id.* §§ 60.200(b), 60.210(b), 60.220(b), 60.230(b), 60.240(b)), and more. In short, EPA has an ample historical basis for applying the same performance standards to modified and reconstructed EGUs that it applies to new steam EGUs.

As we described in our coalition comments for the proposed new source rule, CCS is an adequately demonstrated technology that has been used for decades in various industrial sectors and can be easily integrated into EGUs.[22] Moreover, it is well within the cost threshold contemplated by section 111(b).[23] EPA provided a comprehensive discussion of the

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[21] *See* Comments on the Proposed New Source Rule at 110.
[22] *See id.* at 73-82.
[23] *Id.* at 31-33.

technological and economic considerations of partial CCS as a regulatory requirement and canvassed the various CCS projects that are planned, under construction, or now operating.[24] The agency's rationale for partial CCS as BSER for new steam EGUs was fully supported by evidence in the record, and the agency's thorough analysis is equally applicable to a performance standard requiring partial CCS at modified steam EGUs. CCS retrofits for existing steam EGUs, as well as sequestration options for the captured CO_2, are adequately demonstrated, technically achievable, and economically reasonable. Like post-combustion capture technologies for criteria pollutants, such as selective catalytic reduction systems for NO_x emissions and flue-gas desulphurization equipment, carbon capture systems are end-of-the-pipe pollution control projects that can be installed without significant modification to other aspects of the plant or disruption to the fuel combustion process. Therefore, EPA should consider partial CCS BSER for modified steam EGUs and should establish a performance standard no less stringent than 1,200 lbs CO_2/MWh for these units, an emission limit that properly reflects the performance capabilities of this technology.

While some plant operators may object to our proposal on the grounds that either it would be too costly or technically infeasible to install CCS technology at their particular facility or to route their captured CO_2 to a sequestration site, this position misconstrues the legal standards under section 111(b), which governs performance standards for modified units. It is true that a BSER under section 111 must be "adequately demonstrated," but the D.C. Circuit has expressly held that this "does *not* mean that existing [sources] must be capable of meeting the standard; to the contrary, '(s)ection 111 looks toward what may fairly be projected for the *regulated future*, rather than the state of the art at present. . . .'" *Nat'l Asphalt Pavement Ass'n v. Train*, 539 F.2d 775, 785-86 (D.C. Cir. 1976) (quoting *Portland Cement Ass'n v. Ruckelshaus,* 486 F.2d 375, 391 (D.C. Cir. 1973)) (emphasis added). To establish BSER, "[t]he Administrator may make a projection based on existing technology, though that projection is subject to the restraints of reasonableness and cannot be based on 'crystal ball' inquiry." *Id.* at 391-92 (citing and quoting *Int'l Harvester v. Ruckelshaus*, 478 F.2d 615, 629 (D.C. Cir. 1973)). Moreover, EPA can "extrapolat[e] . . . a technology's performance in other industries", and look beyond domestic facilities to those used abroad. *Lignite Energy Council v. EPA*, 198 F.3d 930, 934 n.3 (D.C. Cir. 1999). Therefore, EPA need not show that each individual existing source can satisfy the BSER requirements; it simply needs to show that its selection is technologically feasible and is a reasonable projection of what may be available to the industry in the regulated future.

As for cost considerations under section 111(b), the relevant inquiry is sector-wide rather than source-specific. That is, the cost element of a BSER determination serves simply to ensure that a performance standard does not impose costs that are "*greater than the industry could bear and survive*." *Portland Cement Association v. Train,* 513 F.2d 506, 508 (D.C. Cir. 1975) (emphasis added). In other words, so long as the costs of the performance standards are such that the industry as a whole can absorb them and maintain sufficient revenue streams to remain viable, EPA's BSER determination will survive judicial review. *See also Lignite Energy Council*, 198 F.3d at 933 (EPA's choice [of BSER] will be sustained unless the environmental or

[24] 79 Fed. Reg. at 1467-1485.

economic costs of using the technology are exorbitant."). Therefore, the economic impacts of the agency's BSER determination on any specific source are irrelevant; what matters is whether the regulated *sector* can bear the costs of compliance.

As we have discussed, the record evidence that EPA cites in the preamble to its proposed 111(b) rule support a designation of partial CCS as BSER not only for new steam EGUs, but for modified units as well. CCS retrofits are no less achievable than entirely new plants with CCS capabilities and as economically viable as well. Furthermore, sources that wish to make physical or operational changes can avoid triggering the standard by implementing engineering constraints that ensure that the units cannot increase their hourly emissions without an additional capital expenditure.[25] And, as *Nat'l-Southwire Aluminum Co.* makes clear, an operator always has the option of simply choosing not to modify the source, a decision that advances the goals of the Clean Air Act. *See* 838 F.2d at 841. For these reasons, EPA should designate efficient generation technology with partial CCS as BSER for modified units and require those sources to meet an emission limit of 1,200 lbs CO_2/MWh (net) or lower.

3. Efficiency Improvement Projects Can Be Undertaken Without Modifying an EGU for NSPS Purposes

Efficiency upgrades that have been identified for existing EGUs include improvements on a number of operation and maintenance controllable variables, among which are (1) air in-leakage into the boiler setting; (2) pulverizer fineness, mechanical tolerances, and tuning optimization; (3) optimization of primary, overfire air, and secondary airflow measurement and control; (4) balanced fuel and air distribution into the burner belt; (5) air heater leakage; (6) reheater sprays; (7) reheater steam temperature; (8) superheat sprays; (9) superheater steam temperature; and (10) carbon in ash.[26]

Also available are a number of control and instrumentation upgrades (commonly known as neural net controls), as well as equipment upgrades, including improvements to the following components: air heaters, pulverizers, burners, intelligent sootblowing, condensers, variable speed fans, condensers, and steam turbines.[27] Still other options include coal pile

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[25] Furthermore, we are aware of no valid reason why a source could not implement physical or operational changes while accepting a self-imposed constraint in its operating permit not to increase its emissions above prior levels, analogous to a synthetic minor limit in the PSD program.

[26] *See* Storm, Dick, Storm Technologies,Inc., *Applying the Fundamentals for Best Heat Rate Performance of Pulverized Coal Fueled Boilers* (Feb. 2009), attached as **Ex. 4**, delivered at the EPRI 2009 Heat Rate Conference. Referring to the list of operational and maintenance practices set out above, the author concludes that "the average large coal fueled utility steam unit, on a given day, has about 300 to 500 Btu's per kWh heat rate improvement potential."

[27] *See* Henderson, Colin, *Upgrading and Efficiency Improvement in Coal-Fired Power Plants*, CCC/221 (Jan. 8, 2013), *available with registration for download at* http://bookshop.iea-coal.org.uk/reports/Upgrading-and-efficiency-improvement-in-coal-fired-power-plants,-CCC/221/83186; *see also* APEC Energy Working Group, Expert Group on Clean Fossil Energy, *Costs and Effectiveness of Upgrading and Refurbishing Older Coal-Fired Power Plants in Developing Economies*, Energy Working

umbrellas and solar coal drying to reduce coal moisture levels and solar feedwater preheating and acid resistant duct work that permits lower stack exhaust temperatures. Our full comments on the range and effectiveness of Block 1 efficiency improvements are currently being developed and will be submitted prior to the close of the comment period for the agency's proposed 111(d) emission guidelines. At this time, we note that within the entire menu of potential efficiency improvement options, only one upgrade option—turbine blade replacements—has been mentioned as a potential NSPS modification.

Industry representatives have suggested that EPA should not establish rigorous standards for modified units because some potential projects that improve the plant's overall thermal efficiency may also increase a unit's hourly emissions rate of CO_2. These representatives argue that projects of this nature should be encouraged to the greatest extent possible, and highlight in particular the example of turbine blade replacements. While individual blades or groups of blades may routinely be replaced with new blades of the original designs, the maximum generating capacity of the unit (in terms of megawatts) and the unit efficiency can be improved by replacing all of the blades in one or more of the three stages of a steam turbine with improved blade design, blade layout, and edge seals that more effectively convert thermal steam energy into electricity.[28] In some instances, operators have attempted to upgrade only a single stage and have learned that the maximum benefit of these upgrades occurs when the appropriate energy balance to each of the stages is maintained. For instance, if one replaces just the high pressure section with a design that is more effective in capturing the available thermal energy, less energy is available for the downstream intermediate pressure and low pressure sections. For those operators looking for the maximum available capacity increase, the engineering solution is to add additional heat capacity to the boiler. If this choice is made, the unit produces more electricity per unit of fuel than it did previously, but now emits more CO_2 and criteria pollutants per hour as well, in which case the unit may qualify as modified for NSPS purposes.

In fact, source operators can implement many of the potential efficiency upgrade options in a way that would constitute a NSPS modification, but only because those upgrades would result in capacity increases. For example, an operator can improve a unit's efficiency by ensuring a more consistent grind of the incoming coal, and one way of achieving this is to replace worn pulverizers with new and more effective components. But in the process of doing so, an owner could decide to replace the existing pulverizer design with larger capacity units that could increase the feed rate (in terms of tons per hour of pulverized coal) to the boiler, which would increase hourly emissions. This is a *choice* that is available to owners for

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Group Project EWG 04/2003T APEC Energy Working Group Expert Group on Clean Fossil Energy (June 2005), attached as **Ex. 5.**

[28] Steam turbines convert the thermal energy of the steam produced in the boiler into mechanical (rotational) energy that then drives the generator. Turbines consist of banks of vanes or blades in three sections (high pressure, intermediate pressure, and low pressure), which are designed to convert as much of the thermal steam energy into mechanical energy as possible. Also included are edge seals, which prevent steam from leaking around the end of the blade rather than propelling the blade.

condensers, fans, burners, and other components, but under no circumstances is it *necessary* to select a larger capacity component in order to achieve greater efficiency.

Similarly, there is no engineering necessity to add heat to the boiler when upgrading the turbine. Rather, it is merely an option that is available to the operator. Vendors offer turbine blade upgrades that retain the heat balance between the turbine sections and are more focused on efficiency improvements than on capacity increases, and many of the turbine upgrades to date have been made without increasing boiler emissions. It is therefore incorrect to assert, as some industry representatives have done, that plant operators cannot improve their units' thermal efficiency without triggering the NSPS modification rules. This is a circumstance that *may* occur, but plant operators always have the option of undertaking improvement projects that do not increase emissions and hence do not trigger NSPS obligations.

It should also be noted that under the agency's current policy, turbine blade replacements by themselves do not constitute section 111 modifications and thus do not trigger applicability of a modified source performance standard. For electric utility steam generating units, the agency has specified that "steam turbines [are] not part of the existing affected facility for NSPS purposes,"[29] since the core definition of this term at 40 C.F.R. § 60Da only covers "any furnace, boiler, or other device used for combusting fuel for the purpose of producing steam"—not associated steam turbines. The proposed new source rule does not alter this definition in a manner that would add steam turbines to this definition. Furthermore, EPA regulations at 40 C.F.R. § 60.14(e)(2) specify that "[a]n increase in production rate of an existing facility, if that increase can be accomplished without a capital expenditure on that facility" does not constitute a modification under section 111. In other words, a capital expenditure on an affected source is required to trigger a modified source standard, and EPA has determined that "capital expenditure determinations . . . are limited to costs associated with the affected facility."[30] Therefore, under the agency's current policy, a turbine blade replacement project that does not entail capital expenditures to the boiler itself or some other piece of equipment that falls within the definition of "electric utility steam generating unit" does not qualify as a modification for the purposes of the NSPS program, even if the project increases the hourly emission rates of CO_2 or other pollutants.

The most appropriate limit for modified units is the new source standard, which we believe should be no less stringent than 1,200 lbs CO_2/MWh on a net output basis, reflecting a BSER of efficiency generating technology with partial CCS. A number of successful turbine blade replacement projects have been undertaken over the years without associated capital boiler projects that increase hourly emissions.[31] EPA has published at least one Applicability

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[29] Letter from Don R. Clay, EPA, to John W. Boston, Re: WEPCO Final Determinations, ADI Control No. NN05 (Feb. 15, 1989), attached as **Ex. 6**.
[30] *Id.*
[31] *See, e.g.*, Siemens, *A Large Steam Turbine Retrofit Design and Operation History* (Sept. 23, 2005) (copyright) at 15 ("The boiler supplied steam conditions at the Madgett station were not changed as

Determination confirming that turbine blade replacements can be done in a manner that does not constitute a modification under the NSR program.[32] The rationale of this determination would also exempt the project from the NSPS modification rules. To our knowledge EPA has only asserted that the NSPS program applies to large life extension projects, in which a turbine blade replacement would be part of a larger project that included capital boiler upgrades.

4. EPA Must Address Oil and Gas Steam EGUs in its Final Rule

Unlike stationary combustion turbines, which are defined in the language of the proposed new source rule to include only natural gas-fired units, 79 Fed. Reg. at 1506 (proposed 40 C.F.R. § 60.4305(c)(4)), steam EGUs are not defined according to fuel type, but need only "combust[] fossil fuel for more than 10.0 percent of the heat input during any 3 consecutive calendar years." *Id.* at 1502 (proposed 40 C.F.R. § 60.46Da(a)(1)). While most fossil fuel-fired steam EGUs burn coal, there are significant numbers of existing oil- and gas-fired ("O&G") units as well. According to EPA's own data for the Clean Power Plan, O&G steam EGUs generated approximately 100 million MWh in 2012, emitting over 72 million tons of CO_2 into the atmosphere,[33] and the agency has designed its proposed 111(d) emission guidelines to cover these units under Building Block 2's redispatch procedure. While new O&G steam EGUs are not expected to be constructed in the future, operators of existing units may seek to modify or reconstruct their facility to extend the unit's useful life, to increase its generation capacity, or even in an attempt to avoid coverage under an applicable 111(d) state plan, regardless of EPA's position that modified and reconstructed units must adhere to previously existing obligations under such a plan.

However, it is clear from EPA's preamble to the proposed modified/reconstructed rule that the agency only considered coal-fired boilers when developing its proposed performance standards for modified and reconstructed steam EGUs, even though the regulatory definition encompasses O&G steam units as well. At no point in the discussion does the agency address O&G steam units, and some of this discussion is only relevant to coal-fired units, such as the analysis of co-firing as a potential compliance option. *See* 79 Fed. Reg. at 34,982. Our recommended performance standards for modified and reconstructed steam EGUs would be equally effective with regard to either coal-fired or O&G-fired units, should the agency adopt

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part of the turbine upgrade program."), attached as **Ex. 7**; Modern Power Systems, *US utilities opt for steam turbine upgrades* (Apr. 23, 1999), attached as **Ex. 8** ("The governing principle of this programme has been to keep boiler rating levels unchanged. In this way, increases in unit MWe output are achieved entirely through improved efficiency without increasing emissions."); National Coal Council, *Increasing Electricity Availability From Coal-Fired Generation in the Near-Term* (May 2001), excerpt attached as **Ex. 9** ("Turbine upgrades were completed on two 400-MW rated units to obtain an additional 25 MWs per unit. No additional steam was required from the boiler.").

[32] *See* letter from Francis Lyons, EPA, Region 5, to Henry Nickel, Re: Modification Issues for Dense Pack Turbine Project, ADI Control No. 0100044 (May 30, 2000), attached as **Ex. 10**.

[33] EPA, *Clean Power Plan Goal Computation Technical Support Document*, Docket ID No. EPA-HQ-OAR-2013-0602 (June 2014), Appendix 1: State Goal Computation, *available at* http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule-technical-documents.

our proposal. However, it is worth noting that EPA's current proposal for modified and reconstructed steam units, which include emission limits of 1,900 lbs CO_2/MWh for larger facilities and 2,100 lbs CO_2/MWh for smaller plants, are wholly inadequate for O&G steam EGUs, the cleanest of which emit around 1,500 lbs CO_2/MWh.

In its final modified/reconstructed rule, EPA must directly address O&G steam EGUs and make clear that the rule is applicable to those units, which it has not done here. The proposal we discuss in these comments for the modified/reconstructed rule would apply equally to coal-fired and O&G-fired units and would obviate any need to distinguish among these units. In particular, reconstructed steam EGUs—which would only serve as life-extension projects—should be required to meet the new source standard, which includes partial CCS as the BSER. However, should EPA adhere to its proposed standards, it must establish a performance standard for modified or reconstructed O&G steam EGUs that reflects those units' true performance capabilities, rather than lumping them in with much higher-emitting coal-fired plants.

5. The Term "Comparable Entirely New Unit" Refers to a Newly-Built Version of the Existing Unit—Not a Brand New CCS-Equipped Facility

EPA must specify in its final rule that, for the purposes of defining a reconstructed source, a "comparable entirely new unit" refers to a new source with the same technology and specifications as the existing source that is being overhauled. Facility owners have an incentive to define "comparable entirely new unit" in a manner as expensive as possible in order to avoid reaching the 50 percent threshold for fixed capital costs, at which point the source is defined as a reconstructed unit and must comply with the performance standards for such units. However, EPA has consistently interpreted 40 C.F.R. § 60.15 such that a "comparable entirely new unit" is simply a new version of the existing facility in question, and not a new plant with different and updated technology (such as a coal plant equipped with CCS technology). For instance, the agency makes this clear in a 1997 applicability determination letter from Region 9 regarding a gasoline bulk terminal replacement:

> The cost comparison should be for replacement as the facility existed prior to the replacement project (i.e., like for like replacement). For example, if a facility had 100 feet of three inch piping from the premium gas pump to the rack, and it was replaced with 150 feet of 4 inch piping, the facility should state the cost of the 4 inch piping as part of the actual project, but the cost for the comparable equipment should be for 100 feet of new 3 inch pipe.[34]

A Region 1 applicability determination letter from 1999 reflects the same position:

[34] Letter from Ron Krzywosinski, EPA, Region 9, to David Howecamp, Re: Gasoline Bulk Terminal Reconstruction and Comparable Facility, ADI Control No. 0000081 (Apr. 4, 1997), attached as **Ex. 11.**

> The term "comparable entirely new facility" would consist of a new boiler with identical components to the repaired boiler. Although a new boiler would be subject to the NSPS and may have air pollution control equipment or newer pollutant reduction design features such as low NOx burners, reconstruction calculations do not include air pollution control equipment and must compare like components.[35]

Other EPA offices have reached similar conclusions.[36] The agency has also made clear that "when determining the cost of the comparable entirely new facility, one must include all of the components identified in the definition of the affected facility [in the applicable regulations], but cannot include components outside of the defined affected facility."[37] Under both language of the proposed new source rule, a "steam generating unit" is defined as "any furnace, boiler, or other device used for combusting fuel for the purpose of producing steam (nuclear steam generators are not included) plus any integrated equipment that provides electricity or useful thermal output to either the boiler or auxiliary equipment." 79 Fed. Reg. at 1516 (proposed 40 C.F.R. § 60.5580). This definition only covers the boiler itself and any integrated generating equipment—it does not encompass pollution control technology such as CCS systems.

In fact, at the time EPA first defined reconstructed sources, it made clear that "[c]osts associated with the purchase and installation of air pollution control equipment (e.g., baghouses, electrostatic precipitators, scrubbers, etc.) are not considered in estimating the fixed capital cost of a comparable entirely new facility unless that control equipment is required as part of the process (e.g., product recovery)." 40 Fed. Reg. at 58,416. The law on this point could hardly be clearer. Nevertheless, to deter source operators from raising meritless arguments to the contrary, we urge EPA to state explicitly in the final rule that the term "comparable entirely new facilities" do not include CCS systems at coal-fired EGUs, but refers only to new equipment of the kind that both appears at the existing plant and meets the definition of "steam generating unit" that appears in the regulations.

6. A Potential Alternative for Modified Sources

As discussed above, EPA has not offered a full legal rationale for its proposed requirement that modified and reconstructed sources must remain covered under state 111(d) plans, and there is a risk that a court could rule that states cannot be required to subject

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[35] Letter from Michael P. Kenyon, EPA, Region 1, to Christine A. Flass, Re: Reconstruction of Oil-Fired Boiler, ADI Control No. 0200048 (Sep. 3, 1999), attached as **Ex. 12.**

[36] See, e.g., letter from Michael Alushin, EPA, CAMPD, to Ellen Radow Sadat, Re: Reconstruction of a Stationary Combustion Turbine, ADI Control No. 0800031 (Feb. 28, 2008), attached **as Ex. 13**; Letter from James T. Wilburn, EPA, Region 4, to Richard E. Grusnick, Re: Parallel Brown Stock Washer Systems, ADI Control No. 0200030 (June 16, 1988), attached as **Ex. 14**.

[37] Letter from Kenneth Gigliello, EPA, CAMPD, to Laurie Guthrie, Re: Gas Turbine Refurbishment and Commence Construction, ADI Control No. 0900067 (July 3, 2008), attached as **Ex. 15.**

modified and reconstructed sources to ongoing obligations under a state plan. This outcome would erode the integrity of the 111(d) program. Many states have "no more stringent" laws that preclude them from going beyond the requirements of federal law. It is reasonable to assume that these states and perhaps others may seek to artificially shrink the pool of sources that are regulated under their 111(d) plans by encouraging units to make unnecessary modifications and thus escape coverage. This would open up a much easier path toward compliance for those states and impose less of a burden on the units that remain covered under the plan. Even without state encouragement, these sources would have an incentive to modify if their obligations under the modified/reconstructed rule were less stringent than those that would otherwise apply under the applicable 111(d) plan. If available, this option could lead to a large number of sham modifications that serve no purpose other than to remove sources from the 111(d) program.

We believe there is strong legal support for simply applying the new source standard to modified units, as EPA has routinely done in the past. There is no policy argument that would support applying a less stringent standard for reconstructed units or for modified units where the size of the emission increase is unlimited and where no efficiency improvement is documented. As we explain above, efficiency improvement projects can be implemented without increasing hourly emission emissions. If EPA reaches a different conclusion, it may be possible to develop a much narrower and more focused solution than the option that the agency has selected in its modified/reconstructed rule proposal.

We also believe EPA should examine whether it can establish an alternate limit for a subcategory of projects that provide substantial efficiency improvements at the cost of only modest hourly emission increases. Nominally, we suggest that the alternate limit would apply to projects that demonstrate a per-megawatt-hour CO_2 emission rate improvement of at least two percent and an hourly CO_2 emission rate increase of no more than five percent.[38] For sources that qualify, the BSER would be the direct application to the modified source of the kinds of measures included in the four building blocks that EPA has adopted in its proposed 111(d) emission guidelines. Thus, a qualifying modified unit would be subject to a declining emission rate based on application of heat rate improvements (as under Block 1), but with a somewhat more stringent limit reflecting the fact that a capital improvement project is underway. The affected plant would also be subject to limitations on its generation that arise from application of redispatch, renewable energy, and demand-side energy efficiency measures, similar to the reductions expected at existing units would under Building Blocks 2 through 4. The operator could meet these obligations by directly reducing generation at the modified source and/or by implementing or sponsoring retirements, renewable energy development projects, and demand-side energy efficiency programs that would not be credited under the state plan. Offsets related to natural gas redispatch could be accomplished in much the same way that NSR non-attainment offsets are managed today—either by reducing generation at the modified unit or by identifying and securing EGU retirements that would not

[38] The modification rules for other NSPS would remain unchanged, thereby limiting this option to reasonably well controlled units as a practical matter.

be considered in the state plan. Emission rate reductions associated with increased renewable energy and energy efficiency would be managed in the same way as they would under a state plan: the regulated source would either directly sponsor renewable energy and energy efficiency development programs or would hold sufficient valid renewable energy credits ("RECs") to comply with its state's emission rate target set out in the final 111(d) rule.

Under this concept, a qualifying source would be required to implement the same sorts of emission reduction measures that states are likely to include in their 111(d) plans, including mandatory heat rate improvements and reduced utilization based on increased use of low- and zero-carbon generation and energy efficiency. While this program would be based on a BSER determination that is distinct from EPA's BSER for the 111(d) emission guidelines, it would involve similar emission reduction options and would reflect the same technological, economic, and environmental considerations discussed in the 111(d) preamble. *See* 79 Fed. Reg. at 34,855-92. While we believe that the four 111(d) building blocks can be strengthened in numerous ways to ensure a more stringent standard, as we will explain in detail in our forthcoming comments on the 111(d) proposal, we generally support the agency's selection of these measures as BSER, and emphasize that the approach is both cost-effective and adequately demonstrated for existing units. We believe that the same or similar measures are legally, technically, and economically justified as BSER for modified units as well, since those sources are, as a practical matter, simply existing facilities that have undergone a change that increases their hourly emissions.

Finally, we suggest that the final modified/reconstructed rule could also provide an alternate compliance option for modified sources under which a unit may comply with the 111 (b) standard described above by meeting the onsite heat rate improvement obligations and otherwise participating in a state 111(d) plan that covers modified units. Through either this alternate compliance option or the approach described above that implements measures similar to the 111(d) building blocks, EPA might be able to develop a more lenient standard than one requiring partial CCS for a subset of modifying sources that achieve substantial efficiency improvement at the expense of only modest hourly emission increases.

IV. Conclusion

In its approach to modified and reconstructed units, EPA should be mindful of the substantially increased incentive for source operators to pursue life extension projects that logically flows from the agency's proposed requirement that new coal-fired units achieve an emissions limit based on partial CCS. EPA has recognized the risk that sources will partake in sham modification projects to avoid participation in 111(d) state plans. There is no basis in policy or law to provide a less stringent standard than the new source standard for reconstructed units. Similarly, there is no basis in policy or law for a more lenient standard for modified units based on increases in the capacity of feedwater pumps, waterwalls, economizers, superheaters, or other components where there is no increase in the unit's efficiency. Yet, EPA's proposal would provide for a *more* lenient standard for such projects that not only extend the life of the unit, but would allow the existing unit to burn even more coal

and possibly to avoid coverage under a 111(d) state plan and any emission reduction obligations that come with it. And, as discussed above, there is no demonstrated need to for a plant to increase the capacity of its boiler when upgrading its turbine blades.

We recognize the potential appeal of an industry argument with respect to the narrow issue that efficiency improvement projects may increase the hourly emissions of an upgrading unit. As such, we offer a narrow yet effective means to address the issue: application of the four building blocks at a subset of modifying units that meet a specific and rigorous set of criteria. Finally, we note that EPA has failed to properly evaluate BACT determinations in several GHG permitting actions under the PSD/NSR program and has suffered substantial cuts to its enforcement budget. During the early implementation of the 111(b) and 111(d) rules, EPA should assign a high priority to enforcement of the PSD/NSR modification rules to life extension programs at existing coal-fired EGUs that would undercut the purpose and efficacy of the Clean Power Plan.

Respectfully submitted,

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