February 26, 2018

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EPA Docket Center
U.S. EPA, Mail Code 28221T
120 Pennsylvania Ave, NW
Washington DC 20460
Attn: Docket No. ID EPA-HQ-OAR-2017-0545

Re: State Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units, 82 Fed. Reg. 61,507 (Dec. 28, 2017).

Clean Air Task Force (CATF) respectfully submits these comments on the advanced notice of proposed rulemaking entitled: State Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units (ANPR), 82 Fed. Reg. 61,507 (Dec. 28, 2017). Founded in 1996, CATF seeks to help safeguard against the worst impacts of climate change by working to catalyze the rapid global development and deployment of low carbon energy and other climate-protecting technologies, through research and analysis and public advocacy leadership.

These comments supplement the comments, and exhibits, submitted by Joint Environmental Commenters,[1] including CATF. On October 16, 2017, the U.S. Environmental Protection Agency (EPA or Agency) issued a proposed Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 82 Fed. Reg. 48,035 (Proposed Repeal). CATF will also be submitting comments on the Proposed Repeal, which are due April 26, 2018.

I. Summary of CATF comments and recommendations

1. Climate change is escalating, and EPA has a statutory duty to regulate climate-forcing, carbon dioxide from power plants – the largest stationary source of emissions. EPA cannot finalize a repeal of the Clean Power Plan without first finalizing a replacement;
2. An advanced notice of proposed rulemaking is unreasonable after a decade of outreach, public input, agency deliberation and response to comments and given the existence of a robust technical and legal record, including briefing, on regulating carbon dioxide from power plants. EPA has all of the information necessary to proceed with rulemaking;
3. The Clean Power Plan is a legal and workable regulation, in line with the trends and trajectory of the industry. If anything, the rule should be strengthened due to acceleration of, and cost declines associated with, the underlying system of emission reduction. EPA must justify any departures from the Clean Power Plan record;

[1] Appalachian Mountain Club; Center for Biological Diversity; Clean Air Council; Clean Air Task Force; Clean Wisconsin; Conservation Law Foundation; Earthjustice; Environmental Defense Fund; Environmental Law and Policy Center; Minnesota Center for Environmental Advocacy; National Parks Conservation Association; Natural Resources Defense Council; Sierra Club, and the Union of Concerned Scientists.

4. EPA must set binding, numerical emission limits as part of a Clean Air Act section 111(d) rule. The standards of performance for individual units included in a state implementation plan must be no less stringent than emission guideline;
5. The only exception is in a state compliance plan, on a case-by-case basis for a plant with very limited remaining useful life. However, if the emission guideline is not at its maximum stringency and/or includes flexibilities such as trading or averaging, the exemption is not appropriate, as individual plants can be accommodated;
6. Carbon dioxide regulations for existing power plants are well overdue. EPA should maintain tight timelines for implementation plan submission and review, and should finalize a model rule to expedite implementation;
7. EPA is charged with determining the *best* system of emission reduction. This broad language allows EPA to accommodate the primary system by which the industry is reducing emissions: reducing generation at higher-emitting plants and substituting it with lower-emitting generation;
8. Even if EPA were correct that the statute requires "source specific" approach, reducing generation at a power plant is a traditional inside-the-fence approach to reducing emissions available to achieve significant reductions from the source category;
9. Minimal heat rate improvement is insufficient to meet the requirements of section 111(d) and may even increase pollution counter to the purpose of the Clean Air Act;
10. Co-firing and conversion to natural gas, as well as carbon capture and sequestration, are available at reasonable cost to achieve significant emission reductions from the source category;
11. Modifications associated with increased emissions of any regulated air pollutant must go through new source review and apply pollution controls as required by that process.

II. EPA must withdraw the Proposed Repeal and ANPR. The Agency should implement and strengthen the Clean Power Plan based on the enormous record at its disposal.

a. Existing power plants are significantly contributing to the pollution causing escalating climate change and EPA has a statutory duty to regulate.

In enacting the Clean Air Act, Congress "established a rigorous program for the regulation of existing and new sources of pollution."[2] It "certainly did not intend . . . major pollution problem[s]… to go untreated…"[3] There may be no greater pollution problem than power plants spewing carbon dioxide into the atmosphere.[4] Power plants are, by far, the country's largest

[2] *Ala. Power Co. v. Costle*, 636 F.2d 323, 346 (D.C. Cir. 1979).
[3] *Id.,* at 366.
[4] 80 Fed. Reg., at 64,682 (citing National Research Council, Climate Stabilization Targets, at 3) ("Emissions of CO_2 from the burning of fossil fuels have ushered in a new epoch where human activities will largely determine the evolution of Earth's climate. Because CO[2] in the atmosphere is long lived, it can effectively lock Earth and future generations into a range of impacts, some of which could become very severe.").

stationary source of greenhouse gas emissions.[5] And these emissions are a major contributor to the warmest period in the history of modern civilization.[6]

Time is of the essence in resolving this problem. Global average sea level has risen three inches since 1995 and is expected to rise several more inches in the next 15 years.[7] Heavy rainfalls are increasing in intensity, while extreme heat waves are becoming more frequent.[8] The last few years have seen record-breaking, climate-related, extreme weather and the frequency of such events is only expected to increase.[9]

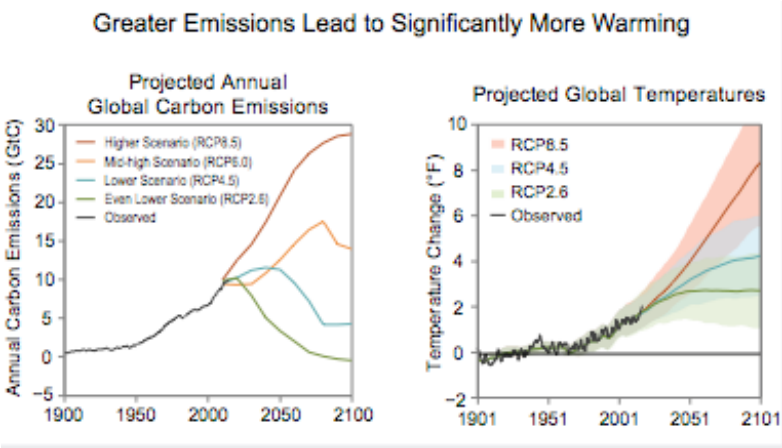

Fig. A: Special Report, at 16, fig. ES-3.

This recent information shows that climate change is occurring even more rapidly than documented in the 2009 Endangerment Finding, where EPA initially found that "total cumulative stock" of greenhouse gases – not just mobile source emissions – could reasonably be anticipated to endanger public health and welfare.[10] The 2009 Finding also recognized that electricity generation was the largest greenhouse gas-emitting sector.[11]

The finding that carbon dioxide endangers human health and welfare gives rise to a statutory mandate found in the Clean Air Act to develop performance standards and emission guidelines applicable to power plants.[12] In finalizing the Clean Power Plan in 2015, EPA recognized this duty.[13]

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[5] 80 Fed. Reg., at 64,688.
[6] Donald J. Wuebbles, *et al.*, U.S. Global Climate Change Research Program, *Climate Science Special Report: Fourth National Climate Assessment, Volume I*, at 10 (2017), *available at* : https://science2017.globalchange.gov/downloads/CSSR2017_FullReport.pdf [hereinafter "Special Report"].
[7] *Id.* at 10.
[8] *Id.*, at 11.
[9] *Id.*
[10] 74 Fed. Reg., 66,496, 66,506 (Dec. 15, 2009).
[11] *Id.*, at 66,539-40.
[12] *See* Order, *West Virginia v. EPA*, 15-1363, ECF 1687838, at 2 (D.C. Cir. Aug. 8, 2017) (Judges Tatel and Millett, concurring) noting that EPA's endangerment finding "triggered an affirmative statutory obligation to regulate greenhouse gases"); *see also Am. Elec. Power v. Connecticut*, 564 U.S. 410, 424 (2011) (noting that section 111 "speaks directly" to the regulation of climate pollution from existing power plants).
[13] 80 Fed. Reg., at 64,709.

The Clean Power Plan is a cost-effective and reasonable regulation, in line with the trends and trajectory of the industry, and an essential first step toward tackling the grave problem caused by carbon dioxide pollution, in this country. In fact, since the finalization of the rule, reliance on the system of emission reduction underlying the Clean Power Plan has increased and the costs of the Plan have decreased. This year's Annual Energy Outlook shows that repeal of the Clean Power Plan would result in approximately 250 million more tons of carbon dioxide in 2050.[14] Due to its statutory obligation, however, EPA *may not* repeal the Clean Power Plan without first finalizing a replacement plan that satisfies section. 111.[15]

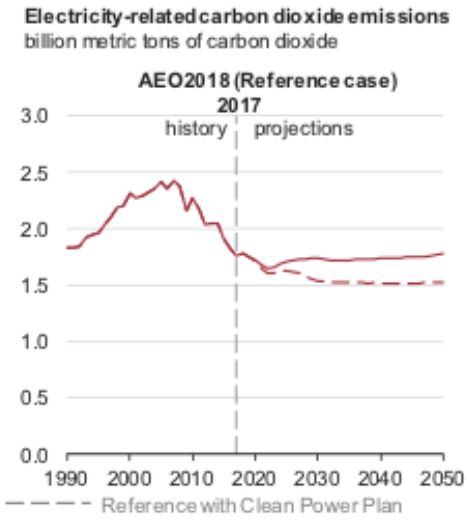

Fig. B: AEO 2018 at 101.

Faced with a statutory duty to address the increasingly catastrophic effects of climate change and the contribution from the largest stationary source of emissions, EPA has been handed a solution with an overwhelming record and ever-declining costs. EPA may not merely "consider[] proposing a future rule."[16] The only reasonable course of action for EPA to undertake is to withdraw the Proposed Repeal and ANPR and pivot its efforts toward implementing and strengthening the Clean Power Plan.

b. EPA has all of the information necessary to move forward regulating carbon pollution from existing power plants.

Over the past ten years, Clean Air Task Force has worked tirelessly on the administrative and legal processes involved in regulating carbon dioxide from power plants. We have submitted seven sets of detailed comments and two briefs on the matter, as listed *infra* page 5. EPA's Clean Power Plan was supported by unprecedented public outreach and comment from others as well; more than for any other rulemaking in the Agency's history.[17] The Agency therefore has more than enough information

[14] U.S. EIA, *Annual Energy Outlook 2018*, at 101 (Feb. 6, 2018), *available at*: https://www.eia.gov/outlooks/aeo/ [hereinafter "AEO 2018"].
[15] *See cf.*, Order, *California v. BLM*, 17-cv-07186-WHO, Doc. 80, at 12 (N.D. Cal. Feb. 22, 2018) (Agency "cannot use the purported proposed future revision, which has yet to be passed, as a justification for" a repeal rule).
[16] 82 Fed. Reg., at 61,508.
[17] *See infra* note 26.

to proceed with a regulation that takes meaningful steps toward reducing climate pollution from existing fossil fuel-fired power plants.

An advanced notice of proposed rulemaking is only necessary and reasonable when an agency is just starting to contemplate regulating a new pollutant or pollution source. Otherwise it is just a chance to delay regulatory action. And EPA has already issued and ANPR on the question of how to regulate carbon dioxide emissions, and for power plants specifically, has undertaken unprecedented outreach, including numerous meetings, beginning in 2012 with multiple public hearings on a proposed rule including alternatives. EPA received at least 4.3 million comments on the best way to reduce existing power plant pollution, through that process, and it was upon this mountain of evidence that EPA finalized the Clean Power Plan. The responses to all of the inquiries EPA makes in its ANPR can be found in the available, overflowing record in EPA's own file cabinets. For example, Clean Air Task Force directs EPA to our previously submitted documents and attaches and incorporates them here by reference. These documents alone contain answers to almost all the questions EPA is now asking (never mind the answers that are available in others' comments in the Clean Power Plan):

- **A**: Br. Of Intervenor Envtl. & Pub. Health Orgs. in Support of Resp't, *North Dakota v. EPA*, 15-1381, ECF 1652432 (D.C. Cir. Dec. 21, 2016);

- **B**: Comment submitted by CATF (Clean Energy Incentive Program), Doc. No. EPA-HQ-OAR-2016-0033-0490 (Nov. 1, 2016);

- **C**: Br. Of Intervenor Envtl. & Pub. Health Orgs. in Support of Resp't, *West Virginia v. EPA*, 15-1363, ECF 1606130 (D.C. Cir. Mar. 29, 2016);

- **D**: Comment submitted by CATF & CLF (Model Trading Rules), Doc. No. EPA-HQ-OAR-2015-0199-1611 (Jan. 21, 2016);

- **E**: Comment submitted by CATF (Clean Power Plan) & Attached Apps. and Exs., Doc. No. EPA-HQ-OAR-2013-0602-25574;

- **F**: Comment submitted by CATF & Partial Carbon Capture and Storage Retrofit Technical Appendix (Modified and Reconstructed Sources), Doc. No. EPA-HQ-OAR-2013-0603-0280 (Oct. 16, 2014);

- **G**: Comment submitted by Sierra Club, *et al.*, (New Source Performance Standards), Doc No. EPA-HQ-OAR-2013-0495-9514 (May 9, 2014);

- **H**: Supplemental comment submitted by CATF & Technical Appendix (New Source Performance Standards) Doc. No. EPA-HQ-OAR-2013-0495-9664 (May 9, 2014);

- **I**: Comments submitted by CATF, *et al.*, (2008 ANPR), Doc. No. EPA-HQ-OAR-2008-0318-1814 (Dec. 28, 2008).

CATF, Alone, Previously Addressed Most of the ANPR Requests for Comment	
ANPR Request for Comment	**Location Previously Addressed**
The roles, responsibilities, and limitations of the federal government, state governments, and regulated entities in developing and implementing such a rule. 82 Fed. Reg., at 61,508.	• C, at 3, 19-20
The EPA is soliciting comment on whether it would be beneficial to States for the EPA to provide sample state plan text as part of the development of emission guidelines. 82 Fed. Reg., at 61,511.	• *See generally* D • E, at 5
The EPA requests comment on whether emission guidelines for GHG emission rate standards is all that it or the States should consider in a potential future rulemaking or whether the use of mass-based emission standards should also be considered. 82 Fed. Reg., at 61,512.	• E, at 103-115 • D, at 9-13
Compliance flexibilities, such as emissions averaging and trading. 82 Fed. Reg., at 61,510.	• *See generally* D • E, at 5-6, 17-18, 57, 64-68, 103-115
The Agency solicits information on any system of emission reduction that commenters believe to be available and applicable for reducing emissions of GHG from existing fossil fuel-fired steam-generating EGUs. 82 Fed. Reg., at 61,517.	• E, at 21-103 • G, at 83-106 • I, at 71-77
The EPA seeks comment on the Modified/Reconstructed rule approach to evaluate unit-specific heat rate improvement opportunities. 82 Fed. Reg., at 61,512.	• F, at 7-11
	• G, at 106-114

CATF, Alone, Previously Addressed Most of the ANPR Requests for Comment	
ANPR Request for Comment	**Location Previously Addressed**
The EPA also requests comment on the merits of differentiating between gross and net heat rate. 82 Fed. Reg., at 61,514.	
Aspects relating to use of carbon capture and storage. 82 Fed. Reg., at 61,510, 61,517.	• A, at 2-18 • B, at 19-24 • D, at 36-42 • E, at 36 -56 & Attached Apps. and Exs. • F, at 7-11 & Partial Carbon Capture and Storage Retrofit Technical Appendix • G, at 73-80 • *See generally* H & Technical Appendix • I, at 71-77
The Agency also seeks information on the appropriate level of monitoring, recordkeeping, and reporting that should be required for sequestered carbon dioxide. 82 Fed. Reg., at 61,517.	• G, at 80-82 • H, at 14-19

This advanced notice of proposed rulemaking is simply inappropriate and unnecessary. Clean Air Task Force urges EPA to abandon this farce and cease delaying action regulating the vast quantities of dangerous carbon dioxide pollution emitted from existing power plants.

c. The ANPR is based upon a false premise; The Clean Power Plan is a legal and workable regulation, which begins limiting carbon emissions from power plants and must go into effect expeditiously.

As CATF will demonstrate in its comments on the Proposed Repeal, EPA is proposing to invent limiting criteria in the Clean Air Act that just do not exist.[18] It is clear that the Agency is significantly changing its position, not for any valid legal reason, but because as a policy matter the Agency intends to avoid regulating this most damaging industry in any meaningful way.

Clean Air Act section 111 and its longstanding implementing regulations require EPA to issue emission guidelines reflecting the degree of emission reduction achievable by existing power plants

[18] The ANPR's assumption that the Proposed Repeal will be finalized based on its proposed legal interpretation of section 111 further evinces EPA's closed mind with respect to the outcome of this pair of rulemakings. *See* Envt'l Def. Fund *et al.*, Comments on EPA Administrator Scott Pruitt's Improper Prejudgment of Outcome of Proposed Repeal of Clean Power Plan, (Jan. 29, 2018), *available at*: http://catf.us/resources/filings/EGU_GHG_NSPS_Rule/Comments%20on%20Proposed%20Repeal%20of%20Clean%20Power%20Plan.pdf.

through application of the best system of emission reduction that the Administrator determines is adequately demonstrated, considering costs, energy requirements, and other enumerated factors.[19] In light of the statutory purpose and context, legislative history and agency practice, EPA in 2015 concluded that the "best system of emission reduction" is a set of measures that work together to reduce emissions, limited to those measures that can be implemented by the sources themselves.[20] This Administration now steps away from its prior reading, and proposes that "system of emission reduction" is limited to emission reduction measures that can be applied to or at an individual source (integrated into its design or operation).[21] However, nothing in the Act limits EPA to designing emission guidelines based on "inside the fence" measures. Arbitrarily, EPA now claims that this new position excludes the system by which the affected sources reduce their carbon dioxide emissions on a daily basis,[22] as we will describe further below.[23]

Furthermore, the broad language found in Clean Air Act section 111 "reflects an intentional effort to confer the flexibility to forestall…[regulatory] obsolescence."[24] EPA's new restricted reading of this section undermines Congress' intent and the purposes of the Clean Air Act, by hamstringing section 111(d)'s ability to accommodate new pollution problems, innovations and solutions.[25]

In developing the Clean Power Plan, EPA recognized its mandate to determine the *best* system of emission reduction and gathered unprecedented public input, even before crafting a proposed rule.[26] EPA built a substantial record, which accounts for the unique characteristics of carbon pollution and climate change as well as the interconnected nature of the electric system and the affected sources. Further, the system of shifting electric generation underlying the Clean Power Plan reflects – and importantly, locks in and builds upon – current market trends and the predominant state and industrial approach to reducing carbon emissions from the affected sources.[27] These market trends

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[19] 42 U.S.C. §§ 7411(a)(1), (d)(1); 40 C.F.R. § 60.22(b)(5).
[20] 80 Fed. Reg., at 64,720.
[21] 82 Fed. Reg., at 48,039.
[22] 80 Fed. Reg., at 64,728-29 (the Clean Power Plan record found that shifting generation among power plants is an "everyday occurrence").
[23] 82 Fed. Reg., at 48,039.
[24] *Massachusetts v. EPA*, 549 U.S. 497, 532 (2007).
[25] A primary goal of this Act is to encourage or otherwise promote reasonable Federal, State, and local governmental actions…for pollution prevention." 42 U.S.C. § 7401(c). "Pollution prevention" is defined as "reduction or elimination, *through any measures*, of the amount of pollutants produced or created at the source." *Id.* at § 7401(a)(1). The purpose of the Clean Air Act is "to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population." *Id.* at § 7401(b)(1).
[26] In March 2011, EPA began holding listening sessions to fulfill its statutory mandate and determine the best system of reducing carbon emissions from existing power plants. On top of the eleven listening sessions, EPA met with 210 separate groups in Washington, D.C., alone. The Agency then held 115 additional meetings and events across the ten regional offices. *EPA Consulted with Hundreds of Groups on Carbon Rule for Existing Power Plants*, DAILY ENVT. REP., (Apr. 8, 2014). During a 166-day comment period, EPA received 4.3 million comments. Over the next eight months, the Agency responded to each of these comments before the rule was finalized. Linda Tsang & Alexandra M. Wyatt, Cong. Research Servs., *Clean Power Plan: Legal Background and Pending Litigation in West Virginia v. EPA*, at 6-7 (Mar. 8, 2017), *available at*: https://fas.org/sgp/crs/misc/R44480.pdf. *See also* Regulations.gov > "Standards of Performance for Greenhouse Gas Emissions from Existing Sources: Electric Utility Generating Units" > "Comments," *available at*: https://www.regulations.gov/docketBrowser?rpp=25&so=DESC&sb=commentDueDate&po=0&dct=PS&D=EPA-HQ-OAR-2013-0602 (last accessed Feb. 22, 2018).
[27] While current market trends show that the Clean Power Plan is eminently achievable, we cannot rely solely on market dynamics to reduce emissions. Preserving the Clean Power Plan is vital to ensure that these emissions reduction trends

are so strong, in fact, that when the Clean Power Plan was finalized, EPA estimated that they highest costs for compliance in 2030 would be $26/ton and when that number was updated in January 2017, it had dropped to $17/ton.[28]

Clean Air Act section 111 was designed to control affected sources "to the greatest degree practicable" to achieve the "national goal of a cleaner environment."[29] Emission guidelines that do not consider the predominant approach for reducing emissions, especially when that system is excluded based on "reasoning divorced from the statutory text,"[30] would be arbitrary and capricious.

III. Form of Emission Guidelines

EPA solicits comment on the roles and responsibilities of states and EPA in setting emission guidelines, focusing primarily on how to provide states with extra-statutory power to accommodate aging and inefficient, coal-fired power plants.[31] We focus on four requests below: 1) whether the emission guidelines must be binding; 2) how states may utilize the remaining useful life exemption; 3) the timeline for implementation plan submission and approval; and 4) whether a model rule is useful.

d. State Implementation Plans may be no less stringent than the emission guideline. (1a)

EPA solicits comment on an approach where the EPA determines what systems may constitute the best system of emission reduction without defining presumptive emission limits and allows states to set any performance standard for individual units.[32]

Clean Air Act section 111 was designed to control plants "to the greatest degree practicable" to achieve the "national goal of a cleaner environment."[33] To that end, section 111(d) directs EPA to issue regulations under which states establish "standards of performance" for emissions from existing sources.[34] A standard of performance is

> a standard for emissions of air pollutants which reflects the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated.[35]

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continue, particularly if natural gas prices rise in the future, which could potentially drive some shift back to coal generation. The Clean Power Plan also provides important policy certainty for power companies and investors.

[28] EPA, *Basis for Denial of Petitions to Reconsider and Petitions to Stay the CAA section 111(d) Emission Guidelines for Greenhouse Gas Emissions and Compliance Times for Electric Utility Generating Units*, at 3 (Jan. 11, 2017).

[29] *Essex Chem. Corp. v. Ruckelshaus*, 486 F.2d 427, 434, n. 14 (D.C. Cir. 1973) (citing S. Rep. No. 1196, 91st Cong., 2nd Sess. 16 (1970)).

[30] *Util. Air Regulatory Group v. EPA*, 134 S. Ct. 2427, 2441 (2014) (citing *Massachusetts*, 549 U.S. at 532, 535).

[31] 82 Fed. Reg., at 61,511-514.

[32] *Id.*, at 61,511.

[33] *Essex Chem. Corp.*, 486 F.2d at 434, n. 14 (citing S. Rep. No. 1196, 91st Cong., 2nd Sess. 16 (1970)).

[34] 42 U.S.C. § 7411(d)(1).

[35] *Id.*, at § 7411(a)(1).

If a state fails to submit a "satisfactory" plan, EPA must promulgate a federal plan.[36] Because section 111(d)(1) requires states to establish "standards of performance," which is a defined term, EPA may not deem a plan "satisfactory" if the performance standards for the sources in question do not reflect the best system of emission reduction.[37] Moreover, the definition of "standard of performance," itself, requires that the "Administrator determine[]" it.[38] This has been EPA's position since 1975 when it stated that

> [a]gainst [the] background of Congressional firmness, the overriding purpose of which was to protect public health and welfare, it would make no sense to interpret section 111(d) as requiring the Administrator to base approval or disapproval of State plans solely on procedural criteria. Under that interpretation, States could set extremely lenient standards – even standards permitting greatly increased emissions – so long as EPA's procedural requirements were met. Given that the pollutants in question are (or may be) harmful to public health and welfare, and that section 111(d) is the only provision in the Act requiring their control, it is difficult to believe that Congress meant to leave such a gaping loophole in a statutory scheme otherwise designed to force meaningful action.[39]

EPA issues an emission guideline which "reflects the degree of emission reduction achievable through the application of the best system of emission reduction which (taking into account the cost of such reduction) the Administrator has determined has been adequately demonstrated for designated facilities."[40] This language requires EPA to identify "the emission levels that are 'achievable' with 'adequately demonstrated technology.' After EPA makes this determination, it must exercise its discretion to choose an achievable emission level, which represents the best balance of economic, environmental, and energy considerations.").[41] "The Clean Air Act entrusts such complex balancing to EPA *in the first instance*… ."[42] That language clearly vests the setting of national goals through the guideline to EPA, and not the states.

Certainly, the states then must develop implementation plans, which establish standards of performance for each designated source – the plan will not be approved as "satisfactory" if the standards are less stringent than the corresponding emission guidelines for a pollutant the Administrator has determined may cause or contribute to endangerment of public health.[43]

In 2009, responding the Supreme Court decision in *Massachusetts v. EPA*, 549 U.S. at 534-35, EPA found that that greenhouse gases, including carbon dioxide endanger public health and welfare,[44] a

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[36] *Id.*, at § 7411(d)(2)(A).
[37] 40 Fed. Reg., at 53,342-43.
[38] 42 U.S.C. § 7411(a)(1).
[39] 40 Fed. Reg., at 53,343; *see also Alaska Dep't of Envtl. Conservation v. EPA*, 540 U.S. 461, 487 (2004) (recognizing that the Court "will normally accord particular deference to longstanding agency interpretations" (quoting *Barnhart v. Walton*, 535 U.S. 212, 220 (2002)).
[40] 40 C.F.R. § 60.21(e).
[41] *Sierra Club v. Costle*, 657 F.2d 298, 330 (D.C. Cir. 1981).
[42] *Am. Elec. Power Co.*, 564 U.S. at 427 (emphasis added).
[43] 40 C.F.R. § 60.24(c).
[44] The 2009 Finding was not source specific in that it determined that the "total cumulative stock" of greenhouse gases – not just mobile source emissions – could reasonably be anticipated to endanger public health and welfare. 74 Fed. Reg.

decision upheld by the D.C. Circuit.[45] EPA's Clean Power Plan record indicates that the threat to public health and welfare has increased since the 2009 Endangerment Finding, due to the extremely long-lived nature of carbon dioxide pollution.[46]

State plans "shall be no less stringent than the…emission guideline."[47] The emission guideline may not merely "determine[] what systems may constitute BSER without defining presumptive emission limits,"[48] it must prescribe a "degree of emission reduction achievable" through those systems.[49] The only means by which a state could impose an approvable standard more lenient than the emission guideline would be based on a case-by-case application, however, as described below that exemption is inappropriate except in the case of maximally stringent standards with minimal flexibilities.[50]

e. An emission guideline that is not at the upper bounds of feasibility and/or includes trading or other flexibilities is not suited for the remaining useful life exemption. (1b)

The EPA requests comment on the role of a state in setting unit-by-unit or broader performance standards for power plants based on the "remaining useful life" provisions.[51]

Once the Agency finalizes emission guidelines for the affected sources, states may take into consideration "the remaining useful life of the existing source" when setting the standard of performance for an individual plant, as is necessary.[52] The section 111(d) implementing regulations allow states to apply for an emission standard less stringent than the emission guideline if the costs of control would be unreasonable due to plant age.[53] EPA may, in its discretion, determine whether to allow states to make this application.[54]

Remaining useful life is not a consideration in EPA's initial determination of the best system of emission reduction underlying the guidelines. "Congress intended the remaining useful life provision to provide a mechanism for states to avoid the imposition of unreasonable retrofit costs on existing sources with relatively short remaining useful lives, a scenario that could result in stranded assets."[55] The exemption is appropriate where the emission guideline is a rigid standard of performance that must be directly implemented by each affected source and there are unique factors that do not allow a specific source to comply. There, the Agency may, approve compliance plans including less

66,496, 66,506 (Dec. 15, 2009). Further, it recognized that electricity generation was the largest emitting sector. *Id.,* at 66,539-40.

[45] *Coal. for Responsible Regulation v. EPA*, 684 F.3d 102, 119-26 (D.C. Cir. 2012) (finding that "substantial evidence" supports EPA's determination that "greenhouse gases contribute to climate change and thus to the endangerment of public health and welfare").

[46] 80 Fed. Reg., at 64,682-88.

[47] 40 C.F.R. § 60.24(c).

[48] 82 Fed. Reg., at 61,512.

[49] 40 C.F.R. § 60.21(e).

[50] *Id.*, at § 60.24(f).

[51] 82 Fed. Reg., at 61,511.

[52] 42 U.S.C. § 7411(d)(1).

[53] 40 C.F.R. § 60.24(f).

[54] *Id.* (explaining that the Agency can "provide otherwise").

[55] 80 Fed. Reg., at 64,872.

stringent emissions standards or compliance timelines for specific plants, on a case-by-case basis because, in those instances the emission guideline is unreasonable.

EPA finalized in the Clean Power Plan an emission guideline including two performance rates. In order to comply, a state must show in its compliance plan that the sources individually, or in aggregate, meet the equivalent performance rate.[56] Further, instead of finalizing a best system of emission reduction that reflected the "maximum possible degree of stringency," the Clean Power Plan reflects a "reasonable degree of stringency."[57] This compliance headroom and flexibility ensures that the states can accommodate any facility-specific factors. Finally, the costs associated with the best system of emission reduction are reasonable and would not require sources to make substantial capital expenditures, thereby potentially stranding assets.[58]

The idea of "taking into consideration remaining useful life" makes sense only as an exception to the presumptive performance standard guideline set by the Agency that is set at the maximum degree of stringency without any compliance flexibility. Otherwise, the inherent flexibility allows states to accommodate all plants of any age, without the need to consider a plant's remaining useful life.[59]

f. The timeframes for plan submission and approval found in the implementing regulations are appropriate. (1a)

EPA requests comment on whether the timelines for state implementation plan submittal and review should be adjusted from those designated in the implementing regulations.[60]

The regulations require states to submit plans within nine months of EPA issuing guidelines,[61] and EPA must take final action on the plans within four months of the deadline for those plans.[62] If appropriate, EPA may extend those deadlines.[63]

Recognizing that the Clean Power Plan provided many flexibilities, some of which may require state legislative approval in certain states, EPA extended the timeframe for submission from nine months

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[56] *Id.*, at 64,667.
[57] *Id.*, at 64,871.
[58] *Id.*, at 64,873.
[59] If EPA finds that plants would benefit from flexibilities, such as trading and averaging, to demonstrate compliance, those flexibilities must be included in the best system of emission reduction and reflected in the stringency of the emission target. While all measures that are available for compliance need not be included in the best system of emission reduction, those that are generally applicable and meet the section 111(d) factors, must be. *See* Kate Konschnik & Ari Peskoe, Harvard Law School, *Efficiency Rules: The Case for End Use Energy Efficiency Programs in the Section 111(d) Rule for Existing Power Plant*s, at 5-6 (Mar. 3, 2014), *available at*: http://blogs.harvard.edu/environmentallawprogram/files/2013/03/The-Role-of-Energy-Efficiency-in-the-111d-Rule.pdf (describing the "symmetry principle."). Biomass burning, however, does not reduce carbon dioxide emissions (if it does so at all, a point that has not been settled), over the near-term time frames of importance here, and therefore is not a candidate for inclusion in the best system of emission reduction as an emissions control method – at the source or otherwise. *See, e.g., Center for Biological Diversity v. EPA*, 722 F.3d 401, 406 (D.C. Cir. 2013) (noting in the PSD context, that carbon dioxide emitted due to biomass burning cannot be distinguished in the atmosphere from carbon dioxide emitted due to fossil fuel burning).
[60] 82 Fed. Reg., at 61,511.
[61] 40 C.F.R. § 60.23(a)(1).
[62] *Id.*, at § 60.27(b).
[63] *Id.*, at § 60.27(a).

to three years, and review from four to twelve months,[64] so that the latest a state could submit its implementation plan for the Clean Power Plan was September 6, 2018.[65] EPA would review and approve or disapprove the plan by September 6, 2019.[66]

Commenters indicated that state legislative cycles can be up to two years and would make plan submittal difficult within a timeframe shorter than that.[67] However, EPA also noted that even prior to finalization of the Clean Power Plan, many states had already begun developing plans, have extensive experience with plan submission under Clean Air Act section 110, and have "well-developed existing programs and the attendant legal authority underpinning such programs."[68]

The final Clean Power Plan was issued on August 3, 2015 and stayed by the Supreme Court on February 9, 2016. But in those six months, states made substantial strides toward plan development, which can be built upon for any replacement rule. EPA should not assume that states must start over but should account for the progress already made toward state plans setting standards for carbon pollution from existing power plants.

In fact, even before finalization, 41 states were actively engaged in developing compliance plans.[69] States were performing in-depth evaluation of plan options, holding stakeholder engagement sessions and one-on-one meetings, conferring with utility commissioners and state energy offices, performing quantitative analysis and meeting with other states regarding regional approaches.[70]

As EPA expressed in 2015, a relevant factor in changing the default submission timelines is the "compelling nature of climate change," and the urgent need to take "timely action to reduce CO_2 emissions."[71] As described in section II.a, time is of the essence – carbon dioxide lasts in the atmosphere for hundreds of years, accumulating so that the atmospheric levels increase exponentially - and the threat of climate change these higher levels pose also continue to escalate. EPA must build upon the progress states have already made and streamline the deadlines for submission and approval.

g. A Model Rule will streamline the much-needed and already-delayed emission reductions. (1a)

EPA requests comment on whether it would be beneficial to States for the EPA to provide sample state plan text as part of the development of emission guidelines.[72]

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[64] 80 Fed. Reg., at 64,855.
[65] *Id.*
[66] *Id.*, at 64,669.
[67] *Id.*, at 64,855.
[68] 80 Fed. Reg., at 64,855.
[69] Emily Holden, *Despite Political Rhetoric, 41 States Exploring Clean Power Plan Options*, CLIMATEWIRE (May 18, 2015), https://www.eenews.net/stories/1060018680.
[70] *See* Gabriel Pacyniak, *Making the Most of Cooperative Federalism: What the Clean Power Plan Has Already Achieved*, 29 GEO. ENVTL. L. REV. 301, 348-351 (2017) (cataloguing the substantial efforts undertaken by states to begin developing state plans).
[71] 80 Fed. Reg., at 64,855.
[72] 82 Fed. Reg., at 51,511.

As CATF has stated in various submissions on carbon regulations for power plants: "Adoption of a [model rule] provides states with a pathway that will reduce the time and resource commitment to implementation plan development."[73]

While EPA did not finalize model trading rules for the Clean Power Plan, it did make public Draft Model Trading Rules late in 2016.[74] These draft rules and other resources provide a robust basis upon which EPA can build.[75]

States have the option to design their own plans to meet the emission guidelines, but several states requested the guidance inherent in model rules during the Clean Power Plan rulemaking and EPA should honor that request here.[76] Model rules are presumptively approvable and can often be incorporated into state regulations by reference, significantly easing the state burden and expediting plan submission.

Providing an approvable model rule will expedite plan submission and implementation. This is important especially due to the delays in implementing a section 111(d) rule for existing power plants. EPA's stated concerns about *appearing* to limit flexibility do not outweigh the benefit of a model rule.

IV. Best System of Emission Reduction

a. Legal Standard for Establishing the Best System of Emission Reduction (2)

EPA requests comment on the "application, in the specific context of limiting GHG emissions from existing EGUs, of reading CAA section 111(a)(1) as limited to emission measures that can be applied to or at a stationary source, at the source-specific level."[77]

A primary goal of the Clean Air Act, in addition to and furthering the purpose of promoting the public health and welfare, is to promote actions for pollution prevention,[78] defined as "the reduction or elimination, *through any measures*, of the amount of pollutants produced or created at the source."[79]

Section 111(d) requires EPA to develop an emission guideline, which reflects "the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately

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[73] Comment submitted by CATF, Doc. No. EPA-HQ-OAR-2015-0199-1611 (Model Trading Rules), at 3 (Jan. 21, 2016); *see also* Comment submitted by CATF, Doc. No. EPA-HQ-OAR-2013-0602-22612, at 104 (Dec. 1, 2014).
[74] Janet McCabe, EPA, "Update on EPA's Clean Power Plan Model Rules," THE EPA BLOG (Dec. 19, 2016), https://blog.epa.gov/blog/2016/12/update-on-epas-clean-power-plan-model-rules/.
[75] If EPA finalizes guidelines based on minimal heat rate improvements, it may not allow trading for compliance unless the availability of trading is incorporated in the stringency of the guidelines. *See supra* note 58.
[76] *See Making the Most of Cooperative Federalism: What the Clean Power Plan Has Already Achieved*, at 343 (citing compilation of state comments).
[77] 82 Fed. Reg., at 61,510.
[78] 42 U.S.C. § 7401(c).
[79] *Id.*, at § 7401(a)(3) (emphasis added).

demonstrated."[80] EPA must interpret the statutory terms in section 111(d) to further the purposes of the Clean Air Act.[81]

The Clean Air Act and its amendments reflect a bold and aggressive response to the threats from air pollution. Describing the related Clean Air Act section 110 program, Senator Muskie recognized that it was Congress's "responsibility to establish what the public interest requires to protect the health of persons [and] [t]his may mean that people and industries will be asked to what seems to be impossible at the present time."[82] The legislative history and purposes of the Act demand a vigorous application of the *best* system of emission reduction.[83]

The Clean Air Act is a technology-forcing statute.[84] Therefore, for the purposes of section 111, "[a]n adequately demonstrated system is one which has been shown to be reasonably reliable, reasonably efficient, and which can reasonably be expected to serve the interests of pollution control without becoming exorbitantly costly in an economic or environmental way. An achievable standard is one which is within the realm of the adequately demonstrated system's efficiency and which, while not at a level that is purely theoretical or experimental, need not necessarily be routinely achieved within the industry prior to its adoption."[85] [86]

The Clean Air Act is designed to internalize the costs of pollution back onto the sources that have otherwise been imposing the costs on public health and the environment. The cost of regulation is therefore appropriate so long as it is not "exorbitant."[87] It is unavoidable that uniform national standards will impose greater burdens on some plants than others, but this does not undermine the

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[80] *Id.*, at § 7411(a)(1).

[81] "[S]tatutes always have some purpose or object to accomplish, whose sympathetic and imaginative discovery is the surest guide to their meaning." *Pub. Citizen v. DOJ*, 491 U.S. 440, 454-55 (1989) (internal citations omitted) (citing *Cabell v. Markham*, 148 F. 2d 737, 739 (CA2), aff'd, 326 U.S. 404 (1945)).

[82] *Union Elec. Co. v. EPA*, 427 U.S. 246, 258-59 (1976).

[83] "Congress did not intend to permit continuance of pollution by industries which have failed to cope with and attempt to solve the problem of pollut[ion]." *NRDC v. EPA*, 804 F.3d 149, 165 (2nd Cir. 2015).

[84] "The state of the art has tended to meander along until some sort of regulation took it by the hand and gave it a good pull." *Int'l Harvester Co. v. Ruckelshaus*, 478 F.2d 615, 622-23 (D.C. Cir. 1973). Congress expected EPA's standards of performance to "press for the development and application of improved technology," *NRDC v. EPA*, 655 F.2d 318, 331 (D.C. Cir. 1981) (citing S.Rep. No. 1196, 91st Cong., 2nd Sess. 24 (1970).

[85] *Essex Chem. Corp.*, 486 F.2d at 433-34.

[86] EPA's standards have been properly based on: 1) "literature review and operation of one plant in the U.S," *Essex Chem. Corp.*, 486 F.2d at 434; 2) "various test programs," *cf. Nat'l Petrochemical & Refiners Ass'n v. EPA*, 287 F.3d 1130, 1137 (D.C. Cir. 2002) (upholding CAA section 202(a)(3) standards for new motor vehicles, which have a similar basis as section 111 standards); 3) "pilot plant technology," *cf. Am. Iron & Steel Inst. v. EPA*, 526 F.2d 1027, 1061 (3rd Cir. 1975) (upholding Clean Water Act standards and guidelines, which are based on the best practicable technology currently available), *cf. FMC Corp. v. Train*, 539 F.2d 973, 983-83 (4th Cir. 1976) (upholding EPA's decision to set Clean Water Act guidelines based on data from a single pilot plant); and 4) "testimony from experts and vendors," *Portland Cement Ass'n*, 486 F.2d 375, 402 (D.C. Cir. 1973). EPA may also base standards upon "the reasonable extrapolation of a technology's performance in other industries." *Lignite Energy Council v. EPA*, 198 F.3d 930, 934 (D.C. Cir. 1978). EPA's standards are also reasonable where "the combination of controls is novel" and each of the "components have been tested and used." *Cf. Sur Contra la Contaminacion v. EPA*, 202 F.3d 443, 448 (1st Cir. 2000) (upholding CAA section 145 best available control technology determination).

[87] *Lignite Energy Council*, 198 F.3d at 933; *see also Portland Cement Ass'n v. Train*, 513 F.2d 506, 508 (D.C. Cir. 1975) (upholding standards where "[t]he industry has not shown inability to adjust itself in a healthy economic fashion").

reasonableness of the standards.[88] The "interpretation of [best system of emission reduction must] incorporate the amount of air pollution as a relevant factor to be weighed when determining the optimal standard…"[89]

b. EPA may not ignore the Clean Power Plan record and must justify any departures from it.

Under the Clean Air Act, as under the APA, a rule must be set aside if it is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law,"[90] or if it was promulgated "without observance of procedure required by law."[91]

Motor Vehicles Manufacturers Ass'n v. State Farm provides the seminal test for reasonable decision-making under the APA:

> the agency must examine the relevant data and articulate a satisfactory explanation for its action including a "rational connection between the facts found and the choice made." In reviewing that explanation, we must "consider whether the decision was based on a consideration of the relevant factors and whether there has been a clear error of judgment." Normally, an agency rule would be arbitrary and capricious if the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.[92]

Agencies cannot rely on political or other reasons that run counter to the purpose and structure of the underlying statute.[93] EPA's conclusions will be overturned "in the absence of reasoned analysis to cogently explain why its recommended measures satisfied the [statute's] requirements."[94]

The application of section 111(d) to carbon pollution from power plants arises "not in a sterile textual vacuum, but in the context of implementing policy decisions in a technical and complex arena."[95] This context has been thoroughly considered and analyzed over the past ten years, starting with a 2008 Advanced Notice of Proposed Rulemaking, asking many of the same questions posed here.[96]

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[88] *See Weyerhouser Co. v. Council*, 590 F.2d 1011, 1054 (D.C. Cir. 1978) (upholding EPA effluent limitations that were more difficult for some mills to meet).
[89] *Sierra Club*, 657 F.2d at 326.
[90] 5 U.S.C. § 706(2)(A); *see also* 42 U.S.C. § 7607(d)(9).
[91] *Id.* at § 706(2)(D).
[92] 463 U.S. 29, 43 (1983) (internal citations omitted).
[93] S*ee Am. Petroleum Inst. v. EPA*, 706 F.3d 474, 479 (2013) ("EPA expressly viewed the data… toward 'promoting growth' in the cellulosic biofuel industry….[S]uch a purpose has no basis in the relevant text of the Act."); *see also Sierra Club*, 657 F.2d at 409 ("Political considerations are improper when they force an agency to make decisions based on factors not relevant to the applicable statute.").
[94] *NRDC v. Daley*, 209 F.3d 747, 755-56 (D.C. Cir. 2000).
[95] *Chevron v. NRDC*, 467 U.S. 837, 863 (1984).
[96] 73 Fed. Reg. 44,354, 44,487-493 (July 30, 2008).

Over the past ten years, EPA has amassed a robust record which reviews and analyzes carbon dioxide and its impact on public health and the environment, its emission from existing power plants, the nature and trajectory of the electric system within which the designated sources operate, and systems of emission reduction utilized by power plants to reduce emissions.[97] The Clean Power Plan was the culmination of years of study and public input.

If EPA changes course, it must "provide a more detailed justification than would suffice for a new policy…when, for example, its new policy rests upon factual findings that contradict those which underlay its prior policy; or when its prior policy has engendered serious reliance interests that must be taken into account. It would be arbitrary and capricious to ignore such matters."[98] "An agency cannot simply disregard contrary or inconvenient factual determinations that it made in the past."[99]

"Courts look closely to determine whether the facts provide an adequate basis for an agency prediction that it can continue to protect the intended beneficiaries of legislation despite deregulation."[100] The purpose of the Clean Air Act is "to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population.[101] Therefore, the Agency should "err on the side of overprotection."[102]

c. The plants in the affected source category already are reducing their carbon dioxide emissions by shifting from coal-fired power plants to renewable energy and gas plants. (2)

EPA is must choose a best system of emission reduction that is "rationally related to reality."[103] In order to be the "best" system it must achieve the deepest reductions possible while accounting for the unique nature of carbon dioxide the power sector and the trends and trajectory of the industry.[104] Determining the best system of emission reduction for existing fossil-fired power plants also requires EPA to review the relevant physical and market context within which the sources exist.[105] The source category exists within a complex and interconnected electric system.[106] This interconnected system has been changing in dramatic ways in recent years, and those changes must be accounted for in any new rulemaking.

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[97] *See* Standard of Performance for Greenhouse Gas Emissions from Existing Sources: Electric Utility Generating Units, Doc. No. EPA-HQ-OAR-2013-0602, https://www.regulations.gov/docket?D=EPA-HQ-OAR-2013-0602.
[98] *FCC v. Fox Television Stations*, 566 U.S. 502, 515-16 (2009) (internal citation omitted).
[99] *Id.*, at 537 (Kennedy, J., concurring); *see also* Order, *California v. BLM*, 17-cv-07186-WHO, Doc. 80, at 17 (N.D. Cal. Feb. 22, 2018) (enjoining 'Suspension Rule' for "casually ignoring all of its previous findings and arbitrarily changing course").
[100] Merrick B. Garland, *Deregulation and Judicial Review*, 98 HARV. L. REV. 507, 535-36 (1985).
[101] 42 U.S.C. § 7401(b)(1).
[102] *NRDC v. EPA,* 902 F.2d 962, 972 (D.C. Cir. 1990); *see also State Farm,* 463 U.S. at 55 ("Congress intended safety to be the pre-eminent factor under the Act").
[103] *Colombia Falls Aluminum Co. v. EPA*, 139 F.3d 914, 923 (D.C. Cir. 1998).
[104] *EPA v. EME Homer City Generation*, 134 S. Ct. 1584, 1594 (2014) (regulators must take into account that particular characteristics of the pollution problem they face when designing a solution).
[105] Congress "usually does not legislate by specifying examples, but by identifying broad and general principled that's must be applied to particular factual instances." *Pub. Citizen*, 491 U.S. at 454-55 (Kennedy, J., concurring); "A given term…may take on distinct characters from association with distinct statutory objects calling for different implementation strategies." *EDF v. Duke Energy Corp.*, 549 U.S. 561, 574 (2007).
[106] *See generally*, *Amicus* for Resp't Br. (Grid Experts), *West Virginia v. EPA*, 15-1363, ECF 1606654 (D.C. Cir. Apr. 1, 2016).

Existing fossil-fired power plants, especially those older, less efficient units, are retiring and being replaced by new natural gas-fired plants and renewable energy.[107] There has been a dramatic shift in how electricity is generated in the past ten years: as seen in Fig. C, coal generation dropped by 16 percent between 2005 and 2016.[108]

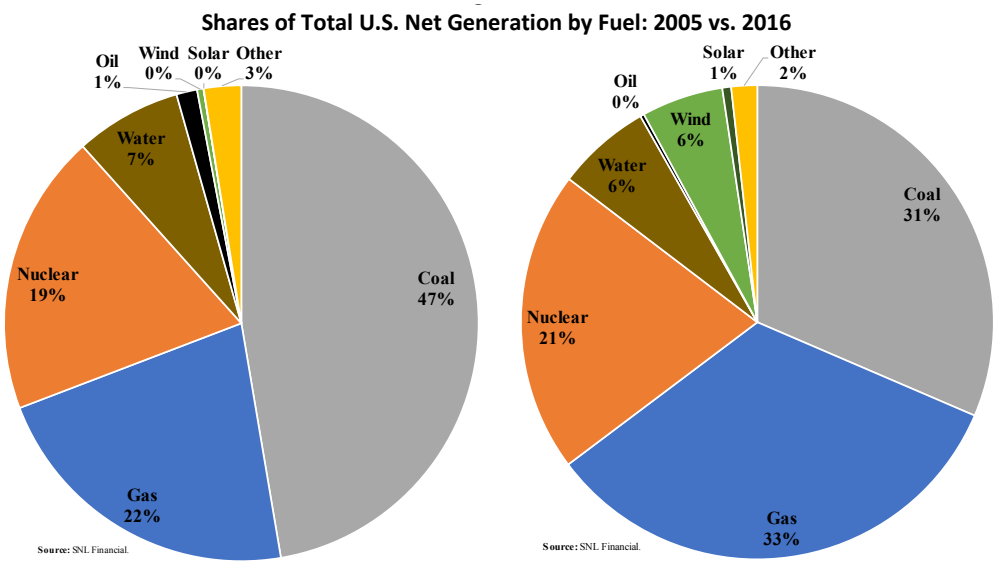

Fig. C: Paul Hibbard, *et al.*, *Electricity Markets, Reliability, and the Evolving Power System*, at 2, fig. 1,

As existing power plants age, they become less economically viable, and in the past 20 years, large quantities of the U.S. fleet's existing capacity has retired.[109] The average age at which a plant retired during this time was at 59 years for coal plants, and 44 years for natural gas plants.

[107] AEO 2018 at 77.
[108] Paul Hibbard, *et al.*, *Electricity Markets, Reliability, and the Evolving Power System*, at 2, fig. 1, (June 2017), *available at*: http://www.analysisgroup.com/uploadedfiles/content/insights/publishing/ag_markets_reliability_final_june_2017.pdf.
[109] *Electricity Markets, Reliability, and the Evolving Power System*, at 20, 22.

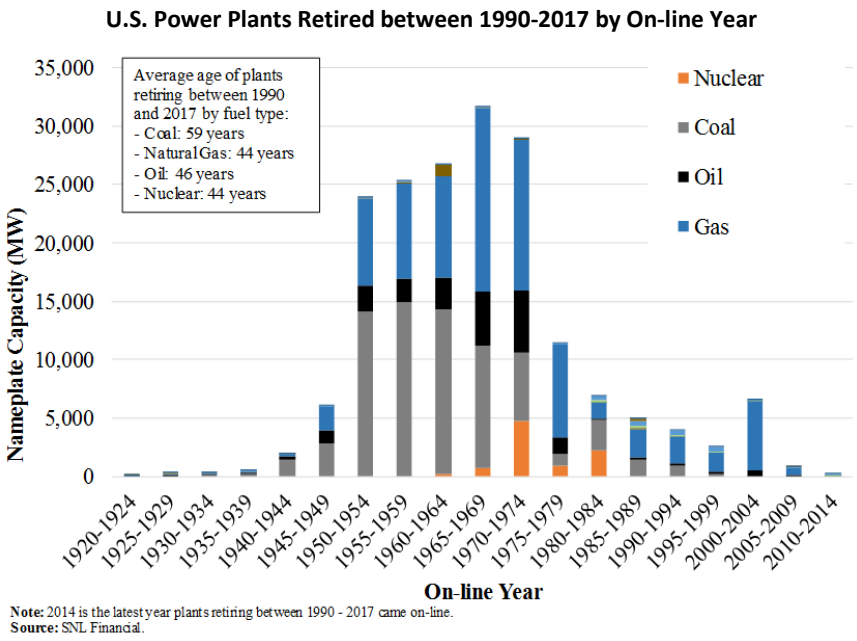

Fig. D: Paul Hibbard, *et al.*, *Electricity Markets, Reliability, and the Evolving Power System*, at 22, fig. 9,

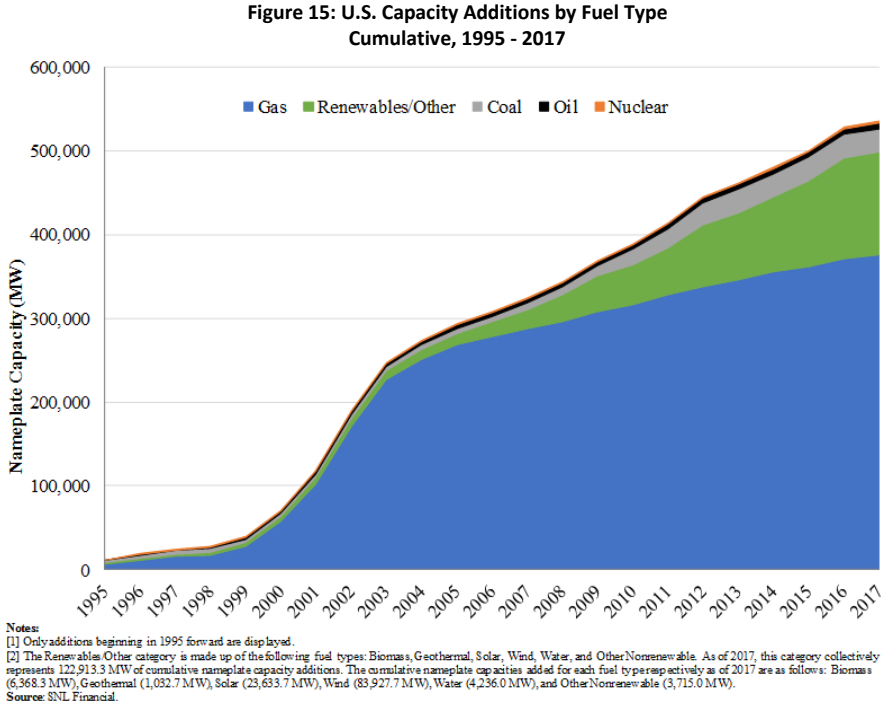

Fig. E: Paul Hibbard, *et al.*, *Electricity Markets, Reliability, and the Evolving Power System*, at 31, fig. 15.

As seen in Fig. E, above, during this period of mass retirements, capacity has largely been replaced by new, more efficient natural gas-fired power plants and renewable energy.[110] Net coal capacity decreased by almost 60 gigawatts between 2011 and 2016.[111] This trend is expected to continue into the future, with an additional 65 gigawatts retiring between 2017 and 2030 before leveling off through 2050.[112]

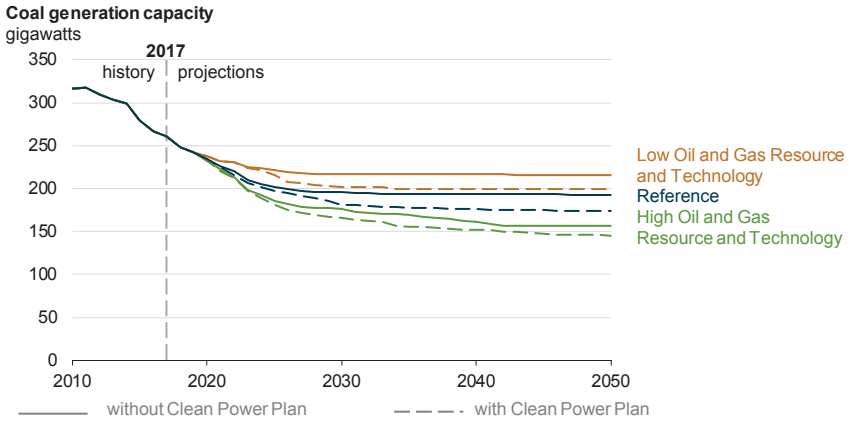

Fig F: AEO 2018, at 87.

Due to ongoing retirements of older units, modest growth in electricity demand, low natural gas prices and declines in the capital costs for renewable energy generation, natural gas and renewables continue to increase their generation output, while coal generation continues to decrease before it plateaus in 2030.[113]

[110] *Electricity Markets, Reliability, and the Evolving Power System*, at 31.
[111] AEO 2018, at 88.
[112] *Id.*; *see also Portland Cement Ass'n*, 486 F.2d at 391 ("section 111 looks what may fairly be projected for the regulated future").
[113] AEO 2018, at 83.

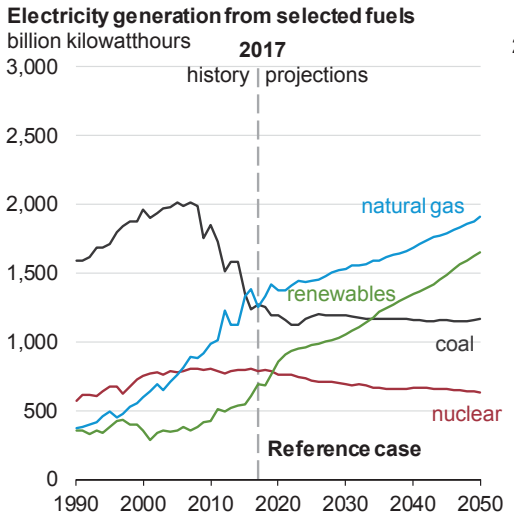

Fig. G: AEO 2018, at 89.

Renewable generation is expected to increase 139 percent through 2050, reaching 1,650 billion kilowatt hours.[114] From 2020 to 2050, wind capacity is expected to grow by 20 gigawatts, solar capacity by 127 gigawatts and storage capacity by 34 gigawatts.[115] This growth will be much more strongly supported now that FERC has ordered that energy storage may operate as both a buyer and a seller on the wholesale market.[116]

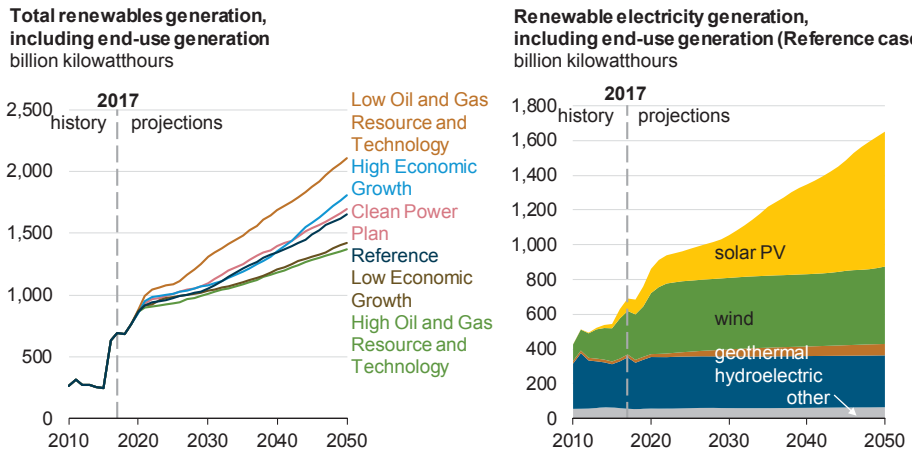

Fig. H: AEO 2018, at 93.

This ongoing (and accelerating) shift from higher-emitting to lower-emitting generation across the sector as a whole is reducing the carbon emissions associated with electricity generation. To select

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[114] *Id.*, at 94

[115] *Id.*, at 96.

[116] FERC, Order 841, Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators, (Feb. 15, 2018), *available at*: https://www.ferc.gov/whats-new/comm-meet/2018/021518/E-1.pdf.

the best system of emission reduction, it is essential for EPA to assess those adequately demonstrated systems the existing affected sources in the source category actually are using to reduce the relevant emissions in the real world. To interpret "system" to exclude the primary means by which the regulated industry is reducing regulated emissions would be the height of unreasonableness.

d. Even if EPA's invented criteria for section 111(d) regulation were legitimate, the Clean Power Plan fits within them. Shifting generation from one source to another and reducing generation are traditional approaches applied at the source. (2)

EPA assumes its Proposed Repeal rationale and seeks comment on a proposed reading of section 111 that relies on it. Specifically, EPA is now "reading…CAA section 111(a)(1)…as being limited to emission reduction measures that can be applied to or at an individual stationary source. That is, such measures must be based on a physical or operational change to a building, structure, facility, or installation at that source, rather than measures that the source's owner or operator can implement on behalf of the source at another location."[117]

EPA explains in the Proposed Repeal that the Clean Power Plan's best system of emission reduction was based on a series of available "building block" controls, and that building blocks two and three are (1) substituting increased generation at gas and (2) new zero-emitting renewable sources for *decreased generation from affected fossil-fuel fired units*.[118] EPA described in 2015 that due to the "integrated nature of the electricity system, combined with the system's high degree of planning and reliability safeguards, as well as the long planning horizon afforded by [the CPP], individual affected EGUs can implement the building blocks by reducing generation."[119]

The ANPR seeks comments on "emission measures that can be applied to or at a stationary source, at the source-specific level."[120] But the Agency misses the central point that there is nothing more "source specific" than controlling the amount of output (in this instance, electricity), and therefore the accompanying air pollution emissions, a source generates.[121] Decreased generation at higher-emitting sources reduces carbon dioxide emissions from those sources. It also reduces emissions from the interconnected electric grid as a whole because it results in increased generation from zero- or low-emitting technologies.

The Clean Power Plan is fundamentally based on the concept that the source category can reduce overall generation (and pollution) by the amounts of electricity available from lower-emitting sources.[122] "With emission limits for the source category as a whole in place, the resulting reduction in supply of higher-emitting generation will incentivize additional utilization of existing NGCC

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[117] 82 Fed. Reg., at 48,039.
[118] *Id.*, at 48,037.
[119] 80 Fed. Reg., at 64,732.
[120] 82 Fed. Reg., at 61,510.
[121] Dan Farber, LegalPlanet, "The Off Switch is Inside the Fenceline," (Dec. 26, 2017), http://legal-planet.org/2017/12/26/the-off-switch-is-inside-the-fenceline/; *see also* Kirsten Engel & Daniel Farber, Comments on Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources (Jan. 15, 2018), *available at*: https://www.law.berkeley.edu/wp-content/uploads/2018/01/CPP-Rulemaking-Comment-Farber-Engel.pdf.
[122] 80 Fed. Reg., at 64,731.

capacity, the resulting reduction in overall fossil fuel-fired generation will incentivize investment in additional RE generating capacity, and the integrated system's response to these incentives will ensure that there will be sufficient electricity generated to continue to meet demand."[123] Reducing generation is a well-established and congressionally-recognized measure for individual power plants to take in order to comply with the Clean Air Act.[124]

There is a long history of EPA, under the Clean Air Act and other environmental statutes, basing rules on sources shifting generation to lower-emitting sources providing the same product (in this case electricity). For example, The Supreme Court upheld a rule, where "EPA created an annual emission 'budget,'"[125] which took into account generation shifts and redispatch from higher-emitting sources to lower-emitting sources.[126] Likewise, the D.C. Circuit largely upheld the NOx SIP Call,[127] which was, in part, based on "increase[d] use of natural gas over coal."[128]

The legislative history of section 111 reveals that Congress intended to aggressively address the harms of air pollution and recognized that every source may not be able to comply with the best system of emission reduction, leading some sources to retire or curtail operations.[129] In an analogous Clean Water Act case, the Supreme Court found that the costs of an existing source standard are reasonable even if it leads to the closure or curtailment of some sources.[130] "Congress foresaw and accepted the economic hardship, including the closing of some plants, that [the standards] would cause."[131]

As discussed above, the trends and trajectory of the electricity sectors demonstrate that older, inefficient plants are curtailing and retiring in favor of lower-emitting sources. This is to be expected as technology advances and Congress anticipated that pollution standards based on the best systems of emission reduction would eventually outpace existing sources' ability to meet those standards. When Congress designed the Clean Air Act, it was under the assumption that "electric utility units had an average lifetime of 30 years."[132] In a Clean Air Act case, the Supreme Court found that so long as generation sources exist such that "demand [is] generally met, the basic requirements of the [CAA] are satisfied," even if that results in pushing out less environmentally protective options.[133]

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123 *Id.*, at 64,732-33.
124 *See, e.g. Id.*, at 64,780-81 (describing the role of reduced generation in Title IV, BART, and permit limitations for various CAA sections).
125 *EME Homer City Generation*, 134 S. Ct. at 1597.
126 76 Fed. Reg. 48,208, 48,252, tbl. VI.B.3n.a & 48,280.
127 *Michigan v. EPA*, 213 F.3d 663, 678-79 (D.C. Cir. 2001), cert. denied, 532 U.S. 904 (Mar. 5, 2001) (No. 00-632).
128 EPA, "Regulatory Impact Analysis for the NOx SIP Call, FIP and Section 126 Petitions," at 6-2 (1998), *available at*: http://yosemite1.epa.gov/ee/epa/ria.nsf/vwTD/9051349471EC8109852566B000569EF5; *see also* 80 Fed. Reg. at 64,772, n. 545.
129 *Portland Cement Ass'n*, 486 F.2d at 391.
130 *EPA v. Nat'l Crushed Stone Ass'n*, 449 U.S. 64, 76 (1980).
131 *Id.*, at 78-79.
132 1990 CAA LEG. HIST. 731, 791 (Nov. 1993).
133 *Cf. Int'l Harvester Co.*, 478 F.2d. at 640 (finding that automobile emission standards are permissible so long as demand for automobiles is met, even if it has the effect of banning less efficient automobiles). "The driving preferences of hot rodders are not to outweigh the goal of a clean environment." *Id.* at 640.

Environmental statutes are designed to internalize the environmental externalities – the economic costs associated with damage from pollution so that those costs are borne by the industry, instead of the public through increased health costs, personal property damage, and environmental degradation. To the extent that the owners of marginal plants cannot absorb those costs, the statute is performing as intended: inefficient plants will curtail their operations or close. This underlying concept was aptly described in the legislative history for the analogous Clean Water Act:

> Congress clearly contemplated that cleaning up the nation's waters might necessitate the closing of some marginal plants. As Senator Bentsen stated: 'There is no doubt that we will suffer some disruption in our economy because of our efforts; many marginal plants may be forced to close.' In sum, while it is clear that the Administrator must consider cost, some amount of economic disruption was contemplated as a necessary price to pay in the effort to clean up the nation's waters[134]

EPA, in the Clean Power Plan, found that reduced *overall* electric generation is not consistent with its interpretation of best system of emission reduction, rather the same amount of electricity must be generated just with fewer emissions, and therefore the best system includes substituting that reduced generation with lower-emitting generation.[135] However, substituting the reduced generation requires no further action from the source owner.[136] Mechanisms are in place in all electricity markets to ensure that the reasonable level of substitute generation is available.[137]

In the Clean Power Plan, EPA concluded that reduced generation meets all the criteria of section 111 defining the best system of emission reduction:

> reduced generation is "adequately demonstrated" as a method of reducing emissions (because Congress and the EPA have recognized it and on numerous occasions, power plants have relied on it); it is of reasonable cost; it does not have adverse effects on energy requirements at the level of the individual affected source (because it does not require additional energy usage by the source) or the source category or the U.S.; and it does not create adverse environmental problems.[138]

EPA limited the best system of emission reduction such that the amount of substitute lower-emitting generation would be available at reasonable cost, and can be substituted for higher-emitting, non-intermittent generation without jeopardizing regional electric system reliability.[139]

Now EPA claims that the Clean Power Plan "depends on the employment of measures that cannot be applied at and to an individual source;"[140] without engaging with the Clean Power Plan's finding that a source need only reduce its own generation. Further, EPA claims that the rule "is formulated in reliance on and anticipation of actions taken across the grid, rather than actions taken at and

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134 *Am. Iron & Steel Inst.*, 526 F.2d at 1052.
135 80 Fed. Reg., at 64,780.
136 *Id.*, at 64,754 (the affected source need not monitor or track the actions the interconnected electric system takes to substitute its generation).
137 *Id.*, at 64,782.
138 80 Fed. Reg., at 64,782, n. 602.
139 *Id.*, at 64,782.
140 82 Fed. Reg., at 48,037.

applied to individual units,"[141] without acknowledging the Clean Power Plan finding that an individual source can reduce generation and take no further action to comply with the best system of emission reduction. Anticipating that low- and zero-emitting energy will substitute reduced generation is not improper, in fact failing to acknowledge the "known behavior" of the electric system would be unreasonable.[142]

The Clean Power Plan is indeed "source specific," based on reduced generation at affected sources and incorporating the rational expectation that the generation will be substituted by low- or zero-emitting generation, with no further action required by the affected sources.

Finally, that reducing generation at affected sources will lead to and incentivize lower-emitting generation to substitute higher-emitting generation does not mean that the rule is unreasonable or unlawful. The Clean Power Plan directly regulates affected sources and no more – Courts continually hold that an agency may incent that which it cannot directly regulate so long as it does so through a mechanism which is within its statutory purview.[143] Reduced higher emitting generation will affect the electric system by encouraging more reliance on lower-emitting generation – but that is "of no legal consequence" because EPA has the direct authority to require affected sources (the higher emitters) to reduce generation.[144]

The Clean Power Plan meets EPA's arbitrary "inside the fenceline" test. In light of the ongoing shift from older, inefficient plants to lower-emitting natural gas plants and renewables as well as the Congressional intent of the Clean Air Act, EPA must analyze the amount of substitution available for the affected sources.[145]

e. Heat rate improvements alone are insufficient to meet the purposes or requirements of the Clean Air Act. (3a)

EPA requests comment on all technologies and practices that may be implemented to improve heat rate as well as the "potential 'rebound effect.'"[146]

Like many of the requests for comment in the ANPR, EPA has been mulling heat rate improvements since 2008 when it found that "[h]eat rate reductions of up to 10% may be feasible through various efficiency improvements at individual coal units."[147]

The Clean Power Plan relied upon over 1,000 comments and a substantial record on heat rate improvements to design its final rule.[148] The rule called for heat rate improvements of 4.9 percent in

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[141] *Id.*
[142] *Chem. Mfrs. Ass'n v. EPA*, 28 F.3d 1259, 1265 (D.C. Cir. 1994); *see also API v. EPA*, 862 F. 3d 50, 68 (D.C. Cir. 2017) (same).
[143] *Conn. PUC v. FERC*, 569 F.3d 477 (D.C. Cir. 2009).
[144] *FERC v. EPSA*, 136 S. Ct. 760, 776 (2016).
[145] CATF CPP Comments, at 56-77 (CATF provided EPA with extensive comments on shifting generation from higher-emitting power plants to natural gas-fired plants); *see also* CATF, *Power Switch: An Effective, Affordable Approach to Reducing Carbon Pollution from Existing Fossil Fueled Power Plants,* (Feb. 2014), *available at*: http://www.catf.us/resources/publications/files/Power_Switch.pdf.
[146] 82 Fed. Reg., at 61,513-517.
[147] 73 Fed. Reg., at 44,492.
[148] 80 Fed. Reg., at 64,787 – 795; *see also* EPA, Greenhouse Gas Mitigation Measures TSD, at ch. 2-1 (Aug. 3, 2015).

the Eastern Interconnect, 2.6 percent in the Western Interconnect, and 3.1 percent in the Texas Interconnect.[149] CATF recommends including heat rate improvements *at least* as stringent as these in a proposed replacement.

However, heat rate improvements alone will not be sufficient, and indeed may cause additional emissions. As EPA has warned,

> limiting the BSER to building block 1 measures would be unreasonable and contrary to the CAA. The BSER underlying the final Rule is a combination of the three building blocks that, when implemented, result in an achievable and significant degree of CO_2 emission reductions from the utility power sector. 80 FR 64,663; *see also id.* at 64,924 (projecting, by 2030, a 32% reduction in CO_2 emissions from 2005 levels). One of the factors that EPA must consider under section 111 is an assessment of the amount of emission reductions that can be achieved through applying a system of emission reduction. *See* 80 FR 64,721 (discussing *Sierra Club v. Costle*, 657 F.2d 298, 326 (D.C. Cir. 1981)). Excluding building blocks 2 and 3 would severely undercut the projections expected by 2030; in fact, reductions from building block 1 alone would be grossly insufficient to address the public health and environmental impacts from CO_2 emissions and limiting the BSER to efficiency measures might actually "exacerbate the insufficiency of the emission reductions." 80 FR 64,787; *see also id.* at 64,748 (expressing concern "that implementation of building block 1 in isolation not only would achieve insufficient emission reductions ... but also has the potential to result in a 'rebound effect.'"). Thus, in light of the significant CO_2 emission reductions attributable to building blocks 2 and 3, it would be unreasonable to limit the BSER to building block 1 measures alone. 80 FR 64727 ("heat rate improvements are a low-cost option that fit the criteria for the BSER, except that they lead to only small emission reductions for the source category.").[150]

With efficiency improvements, the marginal costs of electricity generation for a power plant go down. Since it can produce electricity cheaper and will likely be favored in the dispatch order, it may actually run more than before the improvements, to such an extent that its total carbon emissions would be greater despite fewer emissions per megawatt hour generated.[151] In addition to increasing utilization of plants, efficiency improvements may increase the lifetime of plants thereby increasing overall emissions as compared to the baseline.[152] Further, over time the efficiency improvements

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[149] *Id.*, at 64,789.

[150] EPA, *Basis for Denial of Petitions to Reconsider and Petitions to Stay the CAA section 111(d) Emission Guidelines for Greenhouse Gas Emissions and Compliance Times for Electric Utility Generating Units*, at 55, n. 75 (Jan. 11, 2017); *see also* 80 Fed. Reg., at 64,787; and 82 Fed. Reg., at 48,039, n.5 (acknowledging that the Clean Power Plan building block one cannot stand on its own).

[151] Don Grant, *et al.*, *A Sustainable "Building Block"?: The Paradoxical Effects of Thermal Efficiency on U.S. Power Plants' CO_2 Emissions*, 75 ENERGY POLICY 398 (Dec. 2014) (finding that "efficient power plants have significantly lower emission rates, but significantly higher emission levels"); *see also* Sarah K. Adair, *et al.*, *New Source Review and coal plant efficiency gains: How new and forthcoming air regulations affect outcomes*, 70 ENERGY POLICY 183, 184 (2014) (confirming that efficiency improvements may lead to higher annual emissions).

[152] Dallas Burtraw, Resources for the Future, Comments to the Maryland Office of the Attorney General and the Maryland General Assembly on the Proposed Repeal of the Clean Power Plan, at 10 (Jan. 11, 2018), *available at*: http://www.rff.org/files/document/file/RFF-Testimony-Burtraw-Jan2018_1.pdf.

erode and lead to diminishing emission reductions.[153] Collectively, these problems are known as the "rebound effect."

Therefore, "enhancing plants' thermal efficiency may ironically cause more absolute damage to the climate,"[154] and public health, undermining the purpose of section 111. A scenario based on a four percent heat rate improvement across the fleet was modeled in 2015.[155] This scenario resulted in coal-fired power plants increasing generation by 2020 thereby increasing annual SO_2 emissions by three percent.[156] The scenario also results in increases in annual $PM_{2.5}$ and peak ground level ozone concentrations.[157] Due to the increased pollution associated with the rebound effect, this scenario results in an increase in premature deaths and heart attacks.[158] This is in stark contrast with a modeled scenario similar to the Clean Power Plan, which resulted in 3,500 estimated premature deaths *avoided* annually by 2020.[159]

The study's authors recently released a map, Fig. I, below, showing that "[i]f EPA replaces the Clean Power Plan with a narrower 'inside the fence line' alternative, it will [also] drive up fine particle pollution."[160]

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153 *Id.*

154 Don Grant, *et al.*, *A Sustainable "Building Block"?: The Paradoxical Effects of Thermal Efficiency on U.S. Power Plants' CO_2 Emissions*, 75 ENERGY POLICY 398 (Dec. 2014).

155 Charles T. Driscoll, *et al.*, *US power plant carbon standards and clean air and health co-benefits*, 5 NATURE CLIMATE CHANGE 535 (June 2015).

156 *Id.*, at 536.

157 *Id.*, at 537.

158 *Id.*, at 538.

159 *Id.*

160 Syracuse University, *Study: Clean Power Plan Replacement Worse than Nothing, Costs More than 3,500 Lives and $33B Yearly*, (Oct. 10, 2017) https://news.syr.edu/2017/10/study-clean-power-replacement-worse-than-nothing-costs-more-than-3500-lives-and-33b-yearly/.

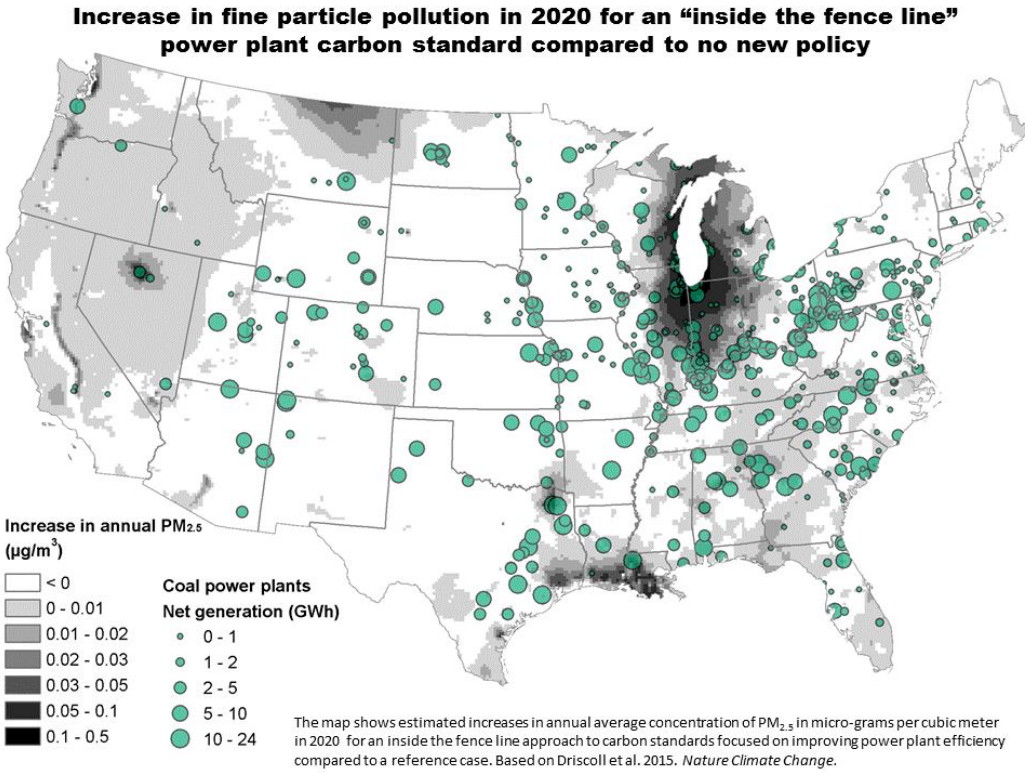

Fig. I: Syracuse University, *Study: Clean Power Plan Replacement Worse than Nothing, Costs More than 3,500 Lives and $33B Yearly*, (Oct. 10, 2017) https://news.syr.edu/2017/10/study-clean-power-replacement-worse-than-nothing-costs-more-than-3500-lives-and-33b-yearly/.

"The bottom line is that the 'inside the fence line' approach would do more harm than good. Not only would it cause thousands of extra deaths and cost billions every year compared to the Clean Power Plan, it would inflict more harm than doing nothing at all."[161]

f. Co-firing and conversion[162] to natural gas is available at reasonable cost to achieve substantial carbon reductions at affected sources. (3a)

The ANPR also includes a "broad solicitation of information on other available systems of GHG emission reduction."[163]

The technology for a fossil steam unit to co-fire with, or convert to, natural gas is well demonstrated and commercially available.[164] In 2014, CATF recommended that EPA include this technology in the

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[161] *Id.*

[162] Co-firing or converting to biomass fuel is not a permissible system of emission reduction under section 111(d). *See* CATF CPP Comments, at 79-97; and *Center for Biological Diversity*, 722 F.3d at 410 (D.C. Cir. 2013) (striking down exemption for sources of biogenic carbon dioxide emissions as unreasonable, arbitrary, and capricious).

[163] 82 Fed. Reg., at 61,516-517.

[164] CATF CPP Comments, at 31 (discussing broad access to gas pipelines).

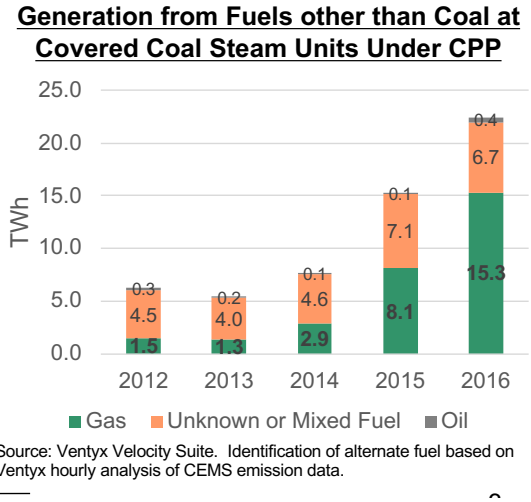
best system of emission reduction and build upon the 11 gigawatts of gas conversion and co-firing, expected by 2023.[165]

Coal-to-Gas Conversions Since 2012

Plant / Unit(s)	State	Owner	MW
Joliet 6-8	IL	NRG	1,350
Gaston 1-4	AL	Southern Co	1020
Watson 4-5	MS	Southern Co	716
Yates 6-7	GA	Southern Co	707
Harding Street 5-7	IN	AES	628
Big Cajun 2 Unit 2	LA	NRG	575
Shawville 1-4	PA	NRG	565
Greene County 1-2	AL	Southern Co	497
Clinch River 1-2	VA	AEP	460
Danskammer 3-4	NY	Mercuria	359
New Castle 3-5	PA	NRG	305
Big Sandy 1	KY	AEP	250
Others from Dominion, SCANA, Ameren, Duke, Alliant, WE Energy, etc.			2,000+

Source: NorthBridge research of EIA data. List may not be complete.

Fig. J: NorthBridge Research of EIA data



Source: Ventyx Velocity Suite. Identification of alternate fuel based on Ventyx hourly analysis of CEMS emission data.

Fig. K: Ventyx Velocity Suite.

As shown in the figures above, between 2012 and 2017, plant owners in a variety of settings have converted over 9 gigawatts of coal-fired generation into primarily gas-fired capacity. The number of coal-to gas conversions is expected to increase going forward as generators retrofit older coal units or build new gas generation on sites where coal units have been dismantled. EPA must analyze, and include in the best system of emission reduction, co-firing and converting affected units to natural gas.

g. Carbon capture and sequestration is an available and necessary component of any "inside the fence" approach. (3c)

The ANPR claims that "EPA previously determined that carbon capture and sequestration (CCS) (or partial CCS) should not be part of the BSER for existing fossil-fuel fired EGUs because it was significantly more expensive than alternative options for reducing emissions."[166] To be clear, EPA *did not* find that CCS was too expensive to represent the best system of emission reduction, instead it found that the building block approach finalized in the Clean Power Plan was *less* expensive. In fact, EPA found that

> co-firing and CCS measures are technically feasible and within price ranges that the EPA has found to be cost effective in the context of other GHG rules, that a segment of the source category may implement these measures, and that the resulting emission reductions could be potentially significant.[167]

[165] *Id.*, at 16 (citing Michael Niven & Neil Powell, *Coal unit retirements, conversions continue to sweep through power sector*, SNL DATA DISPATCH (Oct. 14, 2014)); *see generally id.* at 26-34 (describing the availability, costs, and benefits of gas co-firing and conversion).
[166] 82 Fed. Reg., at 61,517.
[167] 80 Fed. Reg., at 64,727.

> EPA first considered more traditional air pollution control measures, including supply-side efficiency improvements, fuel-switching (for CO_2 emissions, that entails co-firing with natural gas), and add-on controls (for CO_2 emissions, that entails CCS). However, it became apparent that even if the EPA could have finalized those controls as the BSER and established the same uniform CO_2 emission performance rates, the affected EGUs would rely on less expensive ways to achieve their emission limits. Specifically, instead of relying on co-firing and CCS, the affected EGUs generally would replace their generation with lower- or zero-emitting generation--the measures in building blocks 2 and 3--because those measures are significantly less expensive and already well-established as pollution control measures.[168]

To reiterate: CCS is "technically feasible and within price ranges that the EPA has found to be cost effective."[169] In fact, Moody's recently found that the barriers to CCS are not technological but without policy support for CCS, U.S. coal production will continue to decline.[170]

As noted in Chart, above, CATF has provided EPA with a great deal of detail on the costs, technical feasibility, and emission reductions associated with CCS throughout the course of the rulemakings associated with regulating carbon dioxide from power plants.[171] In fact, CATF modeling, presented in our 2014 CPP Comments, showed 16 gigawatts of CCS retrofit available between 2014 and 2022, accounting for 85 million metric tons of carbon emission reductions per year, and we urged EPA to incorporate CCS into the best system of emission reduction. CCS was adequately demonstrated in 2014 and that is even clearer today.

Here, CATF provides an update on developments since our last set of comments, in November 2016. "CCS has the unique capacity to be retrofitted to many existing complexes to allow them to function cleanly for the term of their natural life."[172] There are currently seventeen large-scale, operational CCS facilities around the world, with four more starting up this year.[173] Of the seventeen, twelve are located in North America, and two are retrofits of existing power plants. Chief

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[168] *Id.*, at 64,784.
[169] 82 Fed. Reg., at 61,517.
[170] Anna Zubets-Anderson, *et al.*, Moody's Investor Service, *US production too continue sharp, secular decline absent carbon capture development* (Jan. 25, 2018), https://www.moodys.com/research/Moodys-US-coal-production-will-continue-sharp-secular-decline-without--PR_378666.
[171] Comment submitted by CATF (Clean Energy Incentive Program), at 19-24, Doc. No. EPA-HQ-OAR-2016-0033-0490 (Nov. 1, 2016); Comment submitted by CATF (Model Trading Rules), at 36-42, Doc. No. EPA-HQ-OAR-2015-0199-1611 (Jan. 21, 2016); CATF CPP Comments, at 36 -56 & Attached Apps. and Exs., Doc. No. EPA-HQ-OAR-2013-0602-25574; Comment submitted by CATF, at 7-11 & Partial Carbon Capture and Storage Retrofit Technical Appendix (Modified and Reconstructed Sources), Doc. No. EPA-HQ-OAR-2013-0603-0280 (Oct. 16, 2014); *See generally* Comment submitted by CATF & Technical Appendix (New Source Performance Standards) Doc. No. EPA-HQ-OAR-2013-0495-9664 (May 9, 2014).
[172] Global CCS Institute, The Global Status of CCS: 2017, at 6 (Nov. 13, 2017), *available at*: http://www.globalccsinstitute.com/status;
[173] The Global Status of CCS: 2017, at 5; *see also* Global CCS Institute > Project Database > Large-Scale Facilities https://www.globalccsinstitute.com/projects/large-scale-ccs-projects (last accessed Feb. 9, 2018); *see generally* Br. For *Amici Curiae* Carbon Capture and Storage Scientists in Support of Resp'ts, *North Dakota v. EPA*, No. 15-1381, ECF 1652097 (D.C. Cir. Dec. 21, 2016) (describing "CCS technologies that have been successfully deployed in industrial applications for decades, are commercially available, and have been proven to be technically viable for power plants.").

Climate Change Advisor at Shell International recently stressed that "CCS isn't experimental – it's a reworking of existing oil and gas technologies."[174]

CCS projects, to date, have provided significant lessons "with the potential to reduce future capital and operating costs by as much as 30%."[175] Indeed costs have fallen substantially in the past ten years and the first-of-a-kind, large scale projects as well as new technological developments will lead to additional decreases in the near term.[176]

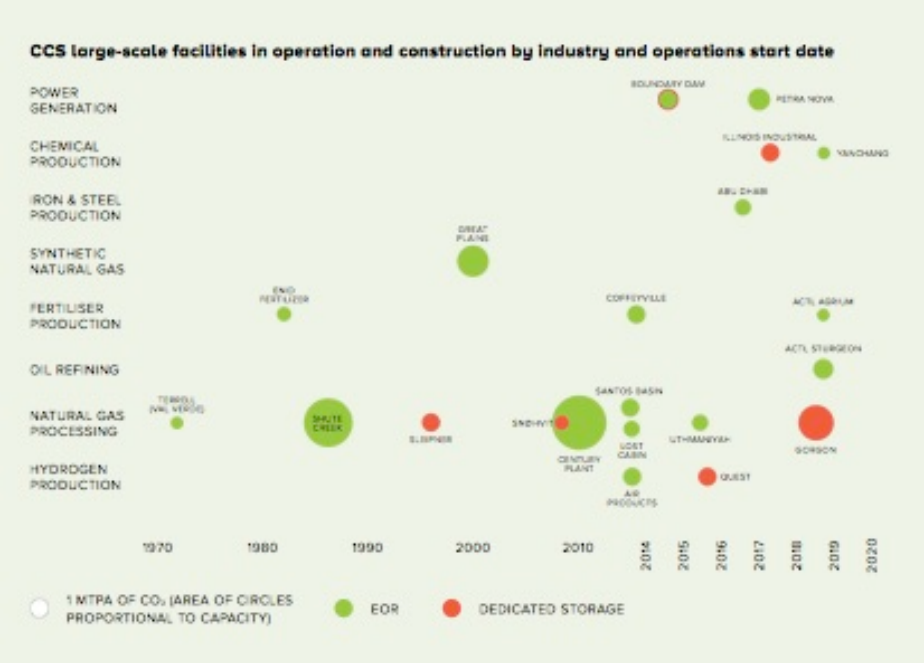

Fig. L: The Global Status of CCS: 2017, at 28.

This month the Bipartisan Budget Act of 2018 was signed into law and increased the "45Q" tax credit for sequestering carbon dioxide from $10 per ton to $35.[177] California is also proposing a quantification methodology that would allow CCS facilities to receive credit under the state's low carbon fuel standard and cap-and-trade system for sequestering carbon.[178] As CATF described in

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[174] The Global Status of CCS: 2017, at 18.

[175] *Id.*, at 19 (describing experience at Boundary Dam and Petra Nova); *see generally* Br. Of *Amici Curiae* Technological Innovation Experts in Support of Resp'ts, *North Dakota v. EPA*, 15-1381, ECF 1652263 (D.C. Cir. Dec. 21, 2016) (describing the "innovation and diffusion of pollution control technology through the adoption of technology-forcing regulation.").

[176] The Global Status of CCS: 2017, at 48; *see also* Lawrence Irlam, Global CCS Institute, *Global Costs of Carbon Capture and Storage: 2017 Update*, (June 2017), *available at*: http://hub.globalccsinstitute.com/sites/default/files/publications/201688/global-ccs-cost-updatev4.pdf.

[177] Bipartisan Budget Act of 2018 § 41119; *see also* Timothy Gardner, *Burying carbon emissions gets boost in U.S. budget deal*, REUTERS (Feb. 9, 2018), *available at*: https://www.reuters.com/article/us-usa-carbon-credit/burying-carbon-emissions-gets-boost-in-u-s-budget-deal-idUSKBN1FT2UT.

[178] California Air Resources Board, *Accounting and Permanence Protocol for Carbon Capture and Geologic Sequestration under Low Carbon Fuel Standard*, (Nov. 6, 2017) https://www.arb.ca.gov/fuels/lcfs/lcfs_meetings/110617ccs_protocol.pdf.

previous submissions, these incentives reduce the costs associated with CCS and are properly accounted for in determining the best system of emission reduction.[179]

On January 10, 2017, the largest retrofit CCS system came online on-time and on budget outside of Houston, Texas at the W.A. Parish Petra Nova plant.[180] This sub-bituminous, coal-fired power plant, originally built in 1958, is currently capturing ninety percent of its carbon dioxide emissions from the 240 MW Unit 8, and sequestering them as part of an enhanced oil recovery operation.[181] The CCS-related upgrades to the plant are expected to pay for themselves within ten years.[182] Petra Nova is twice the size of the Boundary Dam retrofit CCS project in Canada and in October 2017 captured and sequestered its first million tons of carbon dioxide.[183] In addition to Petra Nova, April 2017 the Archer Daniels Midland large-scale, bio-energy, CCS project began operations in Illinois.[184]

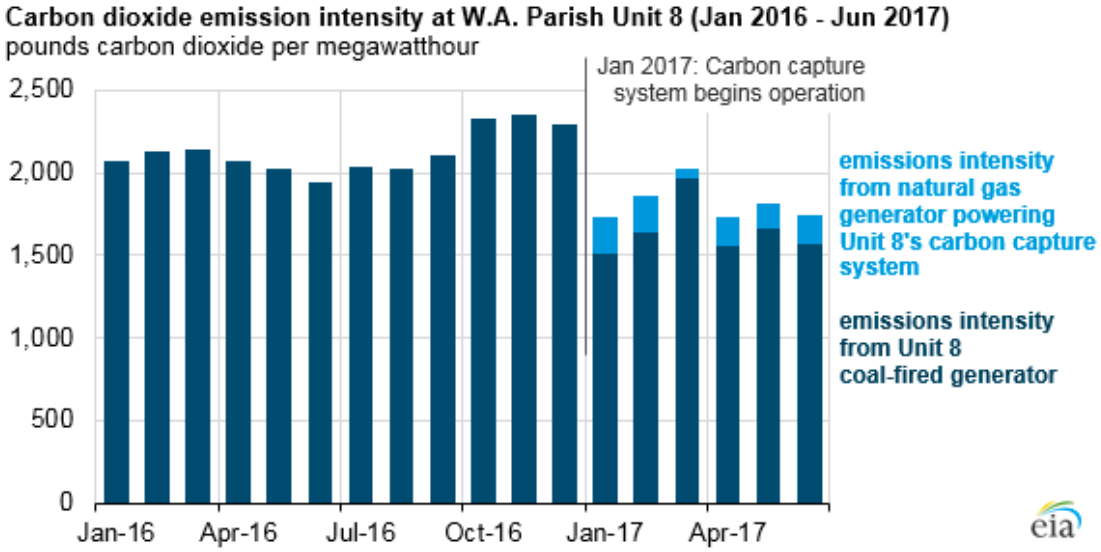

Fig. M: EIA, *Petra Nova is one of two carbon capture and sequestration power plants in the world*, (Oct. 31, 2017), *available at*: https://www.eia.gov/todayinenergy/detail.php?id=33552.

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[179] Supplemental comment submitted by CATF & Technical Appendix (New Source Performance Standards) Doc. No. EPA-HQ-OAR-2013-0495-9664, at 7-12 (May 9, 2014).

[180] The Global Status of CCS: 2017, at 50-51; *see also* NRG, "Petra Nova," http://www.nrg.com/generation/projects/petra-nova/ (last accessed Feb. 12, 2018); EIA, *Petra Nova is one of two carbon capture and sequestration power plants in the world*, (Oct. 31, 2017), https://www.eia.gov/todayinenergy/detail.php?id=33552.

[181] *Id.*

[182] *Id.*

[183] Christa Marshall, *Milestone for Texas project: 1M tons of CO2 stored*, E&E NEWS (Oct. 23, 2017), *available at*: https://www.eenews.net/eenewspm/2017/10/23/stories/1060064365.

[184] The Global Status of CCS: 2017, at 32, 53; Chris Mooney, *The quest to capture and store carbon – and slow climate change – just reached a new milestone*, WASH. POST (Apr. 10, 2017), *available at:* https://www.washingtonpost.com/news/energy-environment/wp/2017/04/10/the-quest-to-capture-and-store-carbon-and-slow-climate-change-just-reached-a-new-milestone/?utm_term=.13878c02b795.

As described in previous comments, Boundary Dam commenced operation and became the first full-scale, coal-fired power plant CCS retrofit in 2014.[185] The SaskPower project added carbon capture to a recently refurbished, 110 MW EGU (Unit 3 at Boundary Dam Power Station). Unit 3 was originally built in 1969 and was scheduled for retirement in 2013. It has captured nearly two million metric tons of carbon dioxide to date and upgrades installed this summer have allowed the plant to stay online at high capacity.[186]

2017 Highlights

2017 saw major advances in CCS deployment with several new facilities deployed and a raft of new facilities moving closer to operation.

In the US, key large-scale facilities became operational:

- On 29 December 2016, Petra Nova Carbon Capture, a joint venture between NRG Energy and JX Nippon Oil & Gas Exploration, began CO_2 capture operations on Unit 8 at the W.A. Parish power plant near Houston Texas. At a capture rate of 1.4 Mtpa, this is the world's largest post-combustion capture facility at a power plant.

- In April 2017, the world's first large-scale bio-energy with CCS facility was launched into operation in Illinois. This facility can capture and store approximately 1 Mtpa of CO_2. It is operated by Archer Daniels Midland and administered by the US Department of Energy's (US DOE's) Office of Fossil Energy.

Other significant milestones around the world included:

- In Norway, the offshore Sleipner and Snøhvit facilities exceeded 20 million tonnes of CO_2 captured and stored, and the EFTA Surveillance Authority (ESA) approved a three-year extension of Norway's aid scheme for carbon capture testing at the CO_2 Technology Centre Mongstad.
- In Canada, the Shell-operated Quest CCS facilities exceeded 2 million tonnes of CO_2 captured and stored since operations began in 2015, a milestone that is being approached by the capture facilities at the Boundary Dam Unit 3 generating plant in Saskatchewan.
- In the US, CCS facilities at a refinery in Port Arthur, Texas, have captured approximately 4 million tonnes of CO_2.
- In Brazil, the Santos Basin offshore facilities have injected over 4 million tonnes of CO_2.

Fig. N: The Global Status of CCS: 2017, at 32.

CCS has no technical or economic barriers to serving as the basis for the best system of emission reduction for existing power plants. If EPA insists on its constrained view of section 111, CCS must be included in a replacement rule.

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[185] CATF, Partial Carbon Capture and Storage Retrofit Technical Appendix (Modified and Reconstructed Sources), Doc. No. EPA-HQ-OAR-2013-0603-0280, at 14-15 (Oct. 16, 2014).
[186] SaskPower, Blog, "BD3 Status Update: January 2018," (Feb. 9, 2018), *available at*: http://www.saskpower.com/about-us/blog/bd3-status-update-january-2018/.

V. New Source Review (4)

EPA seeks comment on the nexus between a carbon dioxide standard or guideline for existing coal- and gas-fired power plants, and the New Source Review (NSR) program found in the Clean Air Act.[187] The NSR program establishes permitting and pollution control requirements for existing sources undergoing modifications where the modification yields air pollution increases above the statutory (and regulatory) thresholds for such pollutants. The program has two parts – the Prevention of Significant Deterioration (PSD) program applicable to sources in attainment areas for a particular pollutant, and the Nonattainment NSR program applicable where a source is located in an area designated nonattainment for a regulated air pollutant.[188] Pollution controls -- the best available control technology (where the source is in an area attaining the national ambient air quality standards (NAAQS) for that pollutant, or the lowest achievable emissions rate where the source is in an area not attaining the NAAQS for that pollutant) must be applied, unless the source nets out with other decreases at the facility.[189]

Congress's purpose in enacting and then strengthening the NSR provisions was to "intensify the war against air pollution,"[190] and to stimulate the development of pollution control technology, through a permitting program established to enhance those goals and environmental improvement, while balancing the economic interests of the regulated industry.[191] There are clear limits in the statute on the Agency's authority to create exemptions from the NSR program. Previous Agency attempts to exempt pollution control projects for one pollutant from NSR review, where they increase collateral emissions of air pollution, have been vacated.[192] As the D.C. Circuit found, the statute – enacted with the overall purpose of decreasing air pollution from existing sources – simply cannot be read congruously to allow non-trivial increases of regulated air pollution from those sources to escape review and regulatory control.[193]

In the context of this rulemaking, where EPA makes clear its preference for carbon dioxide pollution controls that can be applied to or at a source, the NSR program clearly applies where the application of such controls would cause collateral increases in other regulated air pollutants. The Agency's current request for comment on "flexibilities" that could be offered to uncontrolled, existing plans to assist them in avoiding NSR[194] must be informed by EPA's previous attempt to create exemptions from NSR program applicability for Pollution Control Projects, so-called "Clean Units" and efficiency-improving Equipment Replacements. Those exemptions were vacated by the D.C. Circuit in *NY I,* and *NY II* as contrary to the plain language of the statute.[195]

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[187] 82 Fed. Reg. 61,507, 61,509-10, 61,518-19 (Dec. 28, 2017); *See* 42 U.S.C. §§ 7475, 7479, 40 C.F.R. § 51.166 (PSD); 42 U.S.C. §§ 7501-7503, 40 C.F.R. § 51.165 (NNSR provisions).
[188] *See New York v. EPA* 443 F.3d 880, 883-84 (D.C. Cir. 2006) ("*NY II*") (citing *New York v. EPA*, 413 F.3d 3, 12-14 (D.C. Cir. 2005) ("*NY I*") (generally describing the program's requirements).
[189] 42 U.S.C. § 7475 (PSD), 40 C.F.R. § 51.166(w) (PSD Plantwide Applicability Limits); 42 U.S.C. § 7503 (NNSR), 40 C.F.R. § 51.165(a)(1)(vi) (NNSR netting provisions).
[190] *NY I,* 413 F.3d at 12-13.
[191] *Id.*
[192] *NY I*, 413 F.3d, at 3; *NY II*, 443 F.3d at 880.
[193] *NY II,* 433 F.3d at 886.
[194] 82 Fed. Reg. at 61,518-519.
[195] *NY I*, 413 F.3d at 40, 42; *NY II*, 443 F.3d at 883-84.

Now, it must be said that the most effective controls for carbon dioxide emissions: carbon capture and sequestration, fuel switching from coal to gas, and generation shifting from coal to gas, are unlikely to trigger NSR on the basis of collateral pollution increases, as compared with the uncontrolled existing power plant. That is because to make carbon capture work requires very clean emissions streams, including state of the art air pollution controls for other air pollutants and air toxics.[196] Given that fact, even increased generation from a previously less than fully controlled plant will likely not trigger NSR, as pollution control is part of the project – at the very least adding capture would already require more control from existing pollution control equipment to make the capture equipment work. Similarly switching from coal to gas will decrease air emissions across the board, not increase them. And reducing generation at uncontrolled or minimally controlled coal plants, by meeting demand for energy with cleaner sources, is most likely not going to trigger NSR, as projected actual emissions will go down as a result of such actions.

But EPA makes clear that its preference for 'at the plant' carbon dioxide control is limited to efficiency improvements, and the like.[197] Such projects may also be thought of as life-extension projects, requiring – at an old, inefficient facility – equipment replacement to improve heat rates. So-called "flexibilities" to reduce the imposition of NSR merely "extend the lives of obsolescent plants that should be taken out of service" and worsen environmental outcomes.[198] Exempting such equipment replacements (which have the initial consequence of reduced air pollution *rates*) from NSR and the requirement to add or tighten controls is not an option for EPA, however, after *NY II*.[199] That is because making an old plant more efficient is done precisely so it can run more, which will yield increased actual emissions, even over a multi-year lookback period. And that "running more" – and the actual emissions increases that activity generates – is clearly "related" to the project, not an "unrelated demand increase"– particularly in this context. The Administrator is clearly motivated by the President's Executive Order seeking relief for coal-fired power plants.[200] But eligibility for the demand growth exclusion requires satisfying both of two factors, first, that the unit in question could have achieved the additional output before the change, and second, that the additional demand for the unit's increased output is not related to the change. The Clean Power Plan record, and market trends since it was finalized indicate that electricity demand can be met by cleaner sources. And the only reason the upgraded plant would run more – and pollute more than it did before the project – is because it is dispatched before those cleaner sources, which it would not be, had the efficiency upgrades not occurred. For these reasons, the demand growth exclusion from NSR and the need to apply pollution controls is not available for efficiency improvement projects that cause a unit to increase its actual emissions.[201]

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196 Satish Reddy, *et al.*, Fluor, "Fluor's Econamine FG Plus Technology for CO2 Capture at Coal-Fired Power Plants," at 6 (Aug. 2008), *available at*: http://www.econamine.com/pdf/EFG_forCO2CaptureatCoal-FiredPowerPlants-PPAP_Aug2008.pdf (describing the criteria and toxic air pollution controls necessary for effective carbon capture); *see also* The Global Status of CCS: 2017, at 23 (explaining that carbon capture technology is associated with a 90% reduction in sulfur oxide emissions, 70% reduction in nitrogen oxide emissions, 100% reduction in fly ash, and management of mercury and particulate matter).

197 82 Fed Reg., at 61,513. Such projects cannot be said to promote the goal of advancing pollution control technologies.

198 Jonathan Remy Nash & Richard L. Revesz, *Grandfathering and Environmental Regulation: The Law and Economics of New Source Review*, 101 NW. U.L. REV. 1677, 1678 (2007).

199 *NY II,* 443 F.3d at 890 (noting that the statute permits no exemption from NSR for equipment replacement projects that yield non-*de minimis* increases in air pollution).

200 Exec. Order 13,783, Promoting Energy Independence and Economic Growth, 82 Fed. Reg. 16,093 (Mar. 31, 2017).

201 *See NY I*, 413 F.3d at 33.

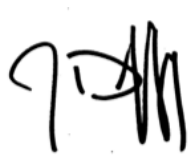
It is the purpose of the NSR program to require the application of the best available control technology – or the achievement of the lowest available emissions rate – when a modification to an existing unit or plant would increase air pollution. Additionally, it is the purpose of the program to create incentives for innovation in pollution control. Clearly neither of those two purposes is achieved by creating exemptions from the pollution control requirements. And allowing increased air pollution, with no regulatory control, increases public health and environmental damage – an outcome contrary to the overall purpose of the Clean Air Act to promote the public health and welfare.

This EPA can look to the Clean Power Plan as a great example of "flexible,"[202] carbon dioxide standard setting – implementable by the dirtiest sources applying pollution controls, or fuel switching, or reducing their generation and allowing demand to be met by cleaner sources. EPA has all the information it needs to go forward with a strong and flexible carbon dioxide standard for this industry, without concern about "excessive" permitting issues.

VI. Conclusion

The trends and trajectory of the affected existing power plants show that the Clean Power Plan was eminently reasonable – indeed, not stringent enough. Nevertheless, the Clean Power Plan is an essential first step to lock in and make enforceable the carbon dioxide emissions reductions occurring due to trends already being observed in the existing coal- and gas-fired electric generating industry – the affected sources. EPA's attempt to slow-walk regulation of these emissions from the largest stationary source of that pollution, in the face of escalating climate change, is truly a dereliction of the duties prescribed to it by Congress in the Clean Air Act, "to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare."[203]

EPA must immediately cease protecting polluters at the expense of public health and the environment. The most lawful and reasoned course of action is to withdraw the Proposed Clean Power Plan Repeal and this ANPR and go about implementing and strengthening the Clean Power Plan. Barring that, a rule "primarily focused on opportunities for heat rate…improvements"[204] is wildly insufficient as it would increase pollution and harms to public health and will not withstand legal scrutiny.



James P. Duffy
Associate Attorney
(617) 624-0234
jduffy@catf.us

Ann Brewster Weeks, Senior Counsel and Legal Director
Conrad Schneider, Advocacy Director

[202] 82 Fed. Reg., at 61,519.
[203] 42 U.S.C. § 7401(b)(1).
[204] 82 Fed. Reg. at 61,518-19 (EPA discusses the availability of Plantwide Applicability Limits in the ANPR, making clear that it understands those flexibilities).