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Washington, DC 20460

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**Attn: EPA-HQ-OAR-2017-0545**

**RE: Comments of Environmental Defense Fund on EPA's Advance Notice of Proposed Rulemaking on State Guidelines for Greenhouse Gas Emissions from Existing Sources, 82 Fed. Reg. 61,507 (Dec. 28, 2017).**

On behalf of its over two million members and supporters, the Environmental Defense Fund ("EDF") hereby submits the following comments on the Environmental Protection Agency's ("EPA's" or the "Agency's") December 28, 2017 advance notice of proposed rulemaking soliciting information on "State Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units"[1] ("ANPR").

EDF is a national non-profit, non-partisan organization dedicated to protecting human health and the environment by effectively applying science, economics, and the law.[2] For over a decade, EDF has engaged in litigation, administrative proceedings, and public outreach to ensure EPA fulfills its obligations under the Clean Air Act ("CAA") to protect Americans from the vast quantities of harmful carbon pollution emitted by the nation's fossil fuel-fired power plants. Since the Clean Power Plan ("CPP") was finalized in August 2015, EDF and a broad coalition of States, municipalities, power companies, health and environmental organizations, and other allies have worked diligently to defend this vital protection in court.

For the reasons described in these comments, EDF urges EPA to withdraw this ANPR and to abandon its misguided effort to repeal the CPP. The CPP is the most important step our nation has taken to address the urgent and dire threat of climate change. Developed after years of public outreach and agency deliberation, and review of over four million public comments, the CPP establishes eminently achievable limits on carbon pollution that are based on proven, cost-effective measures used by the power sector for decades to mitigate carbon dioxide and other

[1] EPA, Advance Notice of Proposed Rulemaking: State Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units, 82 Fed. Reg. 61,507 (Dec. 28, 2017).
[2] In addition to these comments, EDF has submitted comments on the ANPR together with a coalition of other non-governmental organizations.

pollutants. At the same time, the CPP provides States and power companies with extensive flexibility to meet these limits in whatever ways are most cost-effective and best meet local needs and priorities – including through market-based emissions averaging and trading programs, and investments in customer-side energy efficiency that save money for families and businesses. The CPP will significantly reduce climate-destabilizing pollution from the power sector, avoid premature deaths and disease caused by power plant pollution, and drive broad-based investment and job creation in the nation's vibrant clean energy economy.

Almost eleven years after the Supreme Court first recognized EPA's authority and responsibility under the CAA to address the urgent threat of climate change, it is long past time for EPA to implement and strengthen the CPP. Instead, Administrator Scott Pruitt has sought to repeal the CPP outright, without even making a firm commitment to put in place a meaningful replacement. And the Administrator has launched a protracted and unnecessary process – beginning with this ANPR – that is clearly designed to ensure that any "replacement" for the CPP, if it is completed at all, will deliver limited or no benefits for our climate or public health.

Administrator Pruitt's effort to tear down the CPP fails to uphold the Agency's obligations under our nation's clean air laws. It disregards the massive administrative record supporting the CPP, and the voluminous evidence underscoring the urgency of mitigating climate pollution and the reasonableness of the approach reflected in the CPP. And it abdicates EPA's solemn responsibility to protect the health and well-being of all Americans. Administrator Pruitt must abandon his lawless and destructive course of action.

We appreciate EPA's careful consideration of these comments. Please direct any inquiries regarding these comments to Tomás Carbonell, Director of Regulatory Policy at EDF, at tcarbonell@edf.org or 202-572-3610.

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Attachments:

Attachment A: Andover Technology Partners, *Improving Heat Rate on Combined Cycle Power Plants* (Dec. 2016).

Attachment B: Andover Technology Partners, *Natural Gas Conversion and Cofiring for Coal-Fired Utility Boilers* (2014).

Attachment C: Brief of *Amicus Curiae* Dominion Resources, Inc. in Support of Respondent, *West Virginia v. EPA*, No. 15-1363 (filed Apr. 1, 2016).

Attachment D: Clean Air Task Force, Comments on EPA's Proposed Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Generating Units (Dec. 1, 2014).

Attachment E: Department of Energy, *Natural Gas Infrastructure Implications of Increased Demand from the Electric Power Sector* (Feb. 2015).

Attachment F: EDF, Comments of Environmental Defense Fund on EPA's Proposed Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Generating Units (Dec. 1, 2014).

Attachment G: EPA, Available and Emerging Technologies for Reducing Greenhouse Gas Emissions From Coal-Fired Electric Generating Units (Oct. 2010).

Attachment H: EPA, Basis for Denial of Petitions to Reconsider and Petitions to Stay the Clean Power Plan, (Jan. 17, 2017).

Attachment I: EPA, Basis for Denial of Petitions to Reconsider and Petitions to Stay the Clean Power Plan, Appendix 2 – Power Sector Trends (Jan. 2017).

Attachment J: EPA, Basis for Denial of Petitions to Reconsider and Petitions to Stay the Clean Power Plan, Appendix 3 – Non-BSER CPP Flexibilities (Jan. 2017).

Attachment K: EPA, Basis for Denial of Petitions to Reconsider and Petitions to Stay the Clean Power Plan, Appendix 4 – Climate Science Update (Jan. 2017).

Attachment L: EPA, Legal Memorandum Accompanying Clean Power Plan for Certain Issues (Aug. 2015).

Attachment M: EPA, GHG Abatement Measures Technical Support Document (June 2014).

Attachment N: EPA, Greenhouse Gas Mitigation Measures Technical Support Document (Aug. 2015).

Attachment O: GAO, *Climate Change: Information on Potential Economic Effects Could Help Guide Federal Efforts to Reduce Fiscal Exposure* (Sept. 2017).

Attachment P: Denise A. Grab & Jack Lienke, *The Falling Cost of Clean Power Plan Compliance* (Institute for Policy Integrity, Oct. 2017).

Attachment Q: M.J. Bradley & Associates, *Coal-Fired Electricity Generation in the United States and Future Outlook* (Aug. 2017).

Attachment R: M.J. Bradley & Associates, *EPA's Clean Power Plan: Summary of IPM Modeling Results with ITC/PTC Extension* (June 2016).

Attachment S: NASA, *Long-term Warming Trend Continued in 2017: NASA, NOAA*, (Jan. 18, 2018).

Attachment T: Charles T. Driscoll et al., *US Power Plant Carbon Standards and Clean Air and Health Co-Benefits*, Nature Climate Change (May 2015).

Attachment U: Environmental Defense Fund et al., Comments on EPA Administrator Scott Pruitt's Improper Prejudgment of the Outcome of Proposed Repeal of Clean Power Plan, (Jan. 29, 2018), Docket No. EPA-HQ-OAR-2017-0355-17195.

Attachment V: NOAA, *Global Climate Report – Annual 2017* (Jan. 18, 2018).

Attachment W: NREL, *Solar-Augment Potential of U.S. Fossil-Fired Power Plants* (Feb. 2011).

Attachment X: Rhodium Group, *Electric System Reliability: No Clear Link to Coal and Nuclear* (Oct. 2017).

Attachment Y: States and Cities, Comments on EPA Administrator Scott Pruitt's Improper Prejudgment of Outcome of Proposed Repeal of Clean Power Plan, (Jan. 9, 2018), Docket No. EPA-HQ-OAR-2017-0355-7861.

Attachment Z: U.S. Global Change Research Program, *Climate Science Special Report: Fourth National Climate Assessment, Volume I,* (2017).

Attachment AA: The White House, *United States Mid-Century Strategy for Deep Decarbonization* 33-34 (Nov. 2016).

**TABLE OF CONTENTS**

## EXECUTIVE SUMMARY

The Clean Power Plan[3] is the most significant step the United States has taken to address the urgent threat of climate change, and it will have important public health and economic benefits for all Americans. EDF strongly opposes Administrator Pruitt's destructive and unlawful proposal to repeal this vital protection, and his evident intention – manifest in this ANPR – to ensure that any "replacement" for the CPP, if it happens at all, will fail to protect our climate and public health.[4]

EPA is legally obligated to limit emissions of climate pollution from power plants. If EPA finalizes its repeal, it must simultaneously promulgate a lawful replacement to avoid defaulting on its statutory mandates. Any replacement would need to adequately respond to the urgent and severe harms that uncontrolled climate change is inflicting on all Americans; account for current opportunities to reduce climate pollution, including trends since EPA finalized the CPP in 2015; and reflect the power sector's manifest ability to cost-effectively achieve deeper and faster reductions in carbon pollution than are required under the CPP.

1. *Climate change, and the power sector pollution that contributes to it, poses an imminent and dire threat to all Americans.*

Climate change poses an urgent and existential threat to public health and welfare, and it is one of EDF's top priorities to secure rigorous measures that achieve rapid reductions in emissions of climate-destabilizing pollutants.

In 2009, EPA issued an extensive, science-based determination that heat-trapping greenhouse gas emissions endanger the public health and welfare of both current and future generations[5] – a determination that was subsequently upheld by the United States Court of Appeals for the District of Columbia Circuit ("D.C. Circuit") against a barrage of legal challenges.[6] EPA has repeatedly reaffirmed and bolstered that determination in subsequent rulemakings – consistent with recent scientific literature that only adds to the vast body of evidence underlying the Endangerment Finding.[7] According to the most recent scientific assessment by the U.S. Global Change Research Program ("USGCRP") – published in November 2017 and cleared by EPA among other agencies – "there is no convincing alternative explanation" other than human activities for the observed climate warming over the last century.[8]

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[3] EPA, Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64,662 (Oct. 23, 2015) [Hereinafter "CPP Final Rule" or "CPP"].
[4] EPA, Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 82 Fed. Reg. 48,035 (proposed Oct. 26, 2017).
[5] *See* Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496 (Dec. 15, 2009).
[6] *Coalition for Responsible Regulation v. EPA*, 684 F.3d 102, 122 (D.C. Cir. 2012).
[7] *See* CPP Final Rule at 64,675, 64,677, 64,776, 64,684, 64,686; Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources, 81 Fed. Reg. 35,824, 35,834 (June 3, 2016); Finding that Greenhouse Gas Emissions From Aircraft Cause or Contribute to Air Pollution That May Reasonably Be Anticipated to Endanger Public Health and Welfare, 81 Fed. Reg. 54,422 (Aug. 16, 2016).
[8] USGCRP, *Climate Science Special Report: Fourth National Climate Assessment, Volume I*, Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.) 10 (2017), Attachment Z, https://science2017.globalchange.gov/downloads/CSSR2017_FullReport.pdf.

Over the next few decades, the U.S. is expected to warm an additional 2.5°F on average.[9] And as temperatures continue to increase, there is a greater risk that non-linear climate thresholds, or "tipping points," will occur.[10]

Climate change is already affecting the health of Americans, and will continue to pose a serious and growing threat unless action is taken to dramatically limit greenhouse gas emissions.[11] Heat-related deaths are likely to increase as a result of climate change, and air quality is likely to worsen as a result of increased ground-level ozone pollution, increased particulate matter pollution from wildfires, and longer and more severe pollen and mold allergy seasons.[12] Mitigation would result in an estimated 57,000 fewer deaths from poor air quality in 2100.[13]

As EPA has recognized, climate change poses an enormous threat to the U.S. economy.[14] A September 2017 analysis by the Government Accountability Office ("GAO"), evaluating recent studies and expert assessments of the economic impacts of climate change for the U.S., concluded that "climate change could result in significant economic effects in the United States, and the studies indicated that these effects will likely increase over time for most of the sectors analyzed."[15] A Rhodium Group study evaluated by GAO concluded that climate change will result in almost $55 billion in annual economic costs for the United States alone between 2020 and 2039, rising to $1.04 *trillion* in annual costs between 2080 and 2099.[16] EPA's own analysis estimated that a mitigation pathway would result in $10-34 billion in savings on power system costs in 2050, an estimated $6.6-11 billion in avoided damages to agriculture in 2100, and an estimated $11-180 billion in avoided damages from water shortages in key economic sectors in 2100.[17] Mitigation would also result in a cost-savings of $4.2-7.4 billion simply from avoided road maintenance.[18]

Fossil fuel-fired electric generating units ("EGUs") account for nearly 28% of the United States' greenhouse gas emissions.[19] Any serious effort to reduce U.S. carbon pollution must drive significant reductions from these sources.[20]

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[9] *Id.* at 11.
[10] *Id.* at 411.
[11] USGCRP, *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment*, Crimmins, A., J. Balbus, J.L. Gamble, C.B. Beard, J.E. Bell, D. Dodgen, R.J. Eisen, N. Fann, M.D. Hawkins, S.C. Herring, L. Jantarasami, D.M. Mills, S. Saha, M.C. Sarofim, J. Trtanj, and L. Ziska (eds.) (2016).
[12] *Id.* at 71-75.
[13] EPA, Climate Change In the United States: Benefits of Global Action 8, (Aug. 3, 2015), https://19january2017snapshot.epa.gov/cira/downloads-cira-report_.html.
[14] *Id.*
[15] GAO, Climate Change: Information on Potential Economic Effects Could Help Guide Federal Efforts to Reduce Fiscal Exposure 19 (Sept. 2017), Attachment O.
[16] *Id.* at 20 (citing Rhodium Group, *American Climate Prospectus: Economic Risks in the United States* (Oct. 2014)). The aggregate costs reported above reflect the sum of the individual costs presented in Table 1 of the GAO report.
[17] *Id.* at 8-9.
[18] *Id.*
[19] *See* EPA, DRAFT Inventory of U.S. Greenhouse Gas emissions and Sinks: 1990-2016 (Feb. 6, 2018).
[20] *See, e.g.*, The White House, *United States Mid-Century Strategy for Deep Decarbonization* 33-34 (Nov. 2016) (describing electricity "produced almost entirely from clean generation sources by 2050" and "broad utilization of

2. *It would violate EPA's Clean Air Act obligations to repeal the Clean Power Plan without an immediate replacement that complies with EPA's duty to achieve maximum feasible control of carbon pollution.*

In *Massachusetts v. EPA*, the Supreme Court held that "EPA has the statutory authority to regulate the emission of [greenhouse] gases," because they "fit well within the Clean Air Act's capacious definition of an 'air pollutant.'"[21] The Court made clear that EPA was required to determine – based on scientific factors, not policy preferences – whether climate pollution endangers public health or welfare. The Court made clear that if EPA made the requisite determination, EPA was required to act. EPA finalized its "endangerment finding" in 2009.[22]

EPA's legal authority and obligation to regulate climate pollution emissions under the CAA have been affirmed twice more by the Supreme Court. In *American Electric Power v. Connecticut*, the Supreme Court found that section 111 of the CAA "speaks directly" to the regulation of climate pollution from existing power plants.[23] The Court again recognized EPA's authority and obligation to regulate climate pollution in a third decision, *Utility Air Regulatory Group v. EPA*.[24] In 2015, EPA determined that it was appropriate to regulate carbon pollution from new, modified, and reconstructed power plants because of the extraordinary contribution that these sources make to dangerous climate-destabilizing pollution.[25] This triggered a binding obligation under section 111(d) to issue emission guidelines for carbon pollution from existing power plants.

With EPA's obligation to regulate GHGs as an air pollutant firmly established, any action by EPA to repeal the CPP without simultaneously replacing it with a standard that satisfies section 111(d) is unlawful, arbitrary, and capricious. The failure in the ANPR to commit to any replacement whatsoever risks a serious dereliction of EPA's statutory charge.

3. *Any replacement must achieve maximum feasible control of harmful pollution, based on consideration of the full suite of available emission reduction opportunities.*

clean electricity and low-carbon fuels" as central elements of a strategy to reduce net greenhouse gas emissions to 80% below 2005 levels by 2050), Attachment AA.

[21] *Massachusetts v. EPA*, 549 U.S. 497, 532 (2007).

[22] EPA, Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496 (Dec. 15, 2009).

[23] *Am. Elec. Power Co. v. Connecticut*, 564 U.S. 410, 424 (2011).

[24] *Util. Air Regulatory Grp. v. EPA*, 134 S. Ct. 2427, 2448 (2014) (holding that greenhouse gas emissions from sources required to obtain Prevention of Significant Deterioration (PSD) permits are subject to "best available control technology" (BACT) limitations). *See also* Order, *West Virginia v. EPA*, 15-1363, ECF No. 1687838, at 2 (Aug. 8, 2017) (Cir. Judges Tatel and Millett concurring) (recognizing that the Endangerment Finding "triggered an affirmative statutory obligation to regulate greenhouse gases").

[25] Standards of Performance for Greenhouse Gas Emissions From New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64,510, 64,530 (Oct. 23, 2015) [hereinafter GHG NSPS Final Rule].

As EPA has recognized for over forty years, section 111(d) requires "maximum feasible control of pollutants" from designated sources.[26] In reviewing EPA's mandate to determine the best system of emission reduction ("BSER"), the D.C. Circuit could "think of no sensible interpretation of the statutory words 'best . . . system' which would not incorporate the amount of air pollution as a relevant factor to be weighed when determining the optimal standard."[27] The D.C. Circuit has also explained that section 111 has a technology-forcing purpose, which should not only inform the selection of a "best system" but also drive the determination of what standards are "achievable" using that system.[28]

Statutory text, legislative history, administrative precedent, and the overall purpose of section 111 make unmistakably clear that, in crafting emission guidelines for carbon pollution from existing power plants, EPA's goal must be to seek maximum feasible control of these harmful emissions. Given the abundant evidence that the emission reduction targets in the CPP are eminently achievable and extremely cost-effective, and the extensive harm caused by carbon pollution from power plants, it would patently violate that obligation for EPA to opt for a BSER that achieves few or no emission reductions.

In fact, the only reasonable path for a replacement rule would be to adopt more stringent and accelerated emission reduction targets. When EPA finalized the CPP in 2015, it established emission guidelines based "in large part on already clearly emerging growth in clean energy innovation, development, and deployment."[29] Since then, these trends have continued, and the power sector has already achieved approximately three-quarters of the carbon emission reductions that the CPP requires by 2030. Several recent analyses demonstrate that the shift toward lower- and zero-emitting generation is occurring more rapidly than EPA anticipated in the CPP, and CPP compliance costs would be significantly lower than EPA estimated. At the same time, the use of cost-effective energy efficiency measures is expanding – enabling further cost-effective reductions in emissions through greater deployment of clean energy. All of these trends reinforce the potential for faster and deeper reductions in carbon pollution from the power sector going forward.

Many of the nation's largest power companies have announced plans to reduce carbon emissions or increase renewable generation, motivated by the falling cost of cleaner resources, consumer preferences, and environmental concerns. In addition, many States have recently announced new commitments to reduce emissions of climate pollution. Recent studies have also bolstered the CPP's conclusion that significant pollution reductions are fully compatible with electric reliability. Any CPP replacement would need to reflect these developments, which

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[26] State Plans for the Control of Certain Pollutants From Existing Facilities, 40 Fed. Reg. 53,340, 53,342 (Nov. 17, 1975); *see also id.* at 53,344 (stating that "section 111(d) requires *maximum feasible control* of welfare-related pollutants in the absence of" a reasoned basis for a less stringent approach, and that "EPA will promulgate plans requiring maximum feasible control if States fail to submit satisfactory plans for welfare-related pollutants") (emphasis added).

[27] *See Sierra Club v. Costle*, 657 F.2d 298, 326 (D.C. Cir. 1981).

[28] *Id.* at 364; *see also Portland Cement Ass'n v. EPA* (*"Portland Cement III"*), 665 F.3d 177, 190 (D.C. Cir. 2011) (EPA properly based the NSPS for new cement kilns on a recent and more efficient model, even though many older kilns still existed that did not utilize the same technology.).

[29] CPP Final Rule at 64,662.

clearly indicate that pollution reductions well beyond those in the CPP are achievable and cost-effective.

In designing any replacement for the CPP, EPA must consider the full suite of available emission reduction opportunities. Congress intended for EPA to determine the BSER through a broad inquiry, as evidenced by the statutory text and legislative history. Administrative precedent from other CAA regulations further underscores the wide range of available measures. And Congress's mandate that EPA select the "*best* system of emission reduction"[30] precludes an unnecessarily narrow inquiry that would exclude measures offering significant emission reduction opportunities.

Any replacement rule must not assume the correctness of the legal interpretations underlying EPA's proposed repeal of the CPP, which suffers from serious legal defects. Like the proposed repeal of the CPP, the ANPR fails to explain why the BSER reflected in the CPP – which contemplates on-site reductions in utilization at regulated power plants – does not consist of "measures that can be applied to or at a stationary source," consistent with EPA's proposed interpretation of section 111(a)(1). To the extent EPA's interpretation of the statute does preclude the CPP, it is unlawful and unreasonable for reasons that will be more fully explained in our comments on the proposed repeal. Since a reading of the statute that precludes the CPP BSER is not required by – and in fact is in conflict with – the statute, a replacement rule that incorporates that interpretation may not fulfill the statutory requirement to select the "best" system.

Even if EPA bases a CPP replacement on the flawed interpretation of the BSER presented in the proposed repeal, the Agency must consider pollution-control measures that achieve maximally feasible emission reductions. These measures are far broader than the heat rate improvements upon which the ANPR focuses – which EPA already concluded in the CPP would achieve few emission reductions at best, and could in fact *increase* emissions of carbon dioxide and other harmful pollutants. As described below, the BSER inquiry must be expansive – and should include, at minimum, additional measures such as co-firing and conversion to natural gas; carbon capture and storage ("CCS") for coal- and gas-fired units, on-site integration and utilization of renewable energy technologies, coal rank improvements and drying, and reduced utilization. Many of these measures have already been demonstrated as feasible and cost-effective, and they all merit consideration in a replacement BSER. In light of the urgency of the climate threat and the availability of such measures, which are indisputably "measures that can be applied to or at a stationary source," a decision to adopt weak emissions targets would be unlawful.

In neither the proposed repeal nor the ANPR does EPA explain how its new interpretation of the BSER would permit standards of performance that allow for compliance through averaging and trading emissions across sources. If EPA nonetheless determines that averaging, trading, and similar flexibilities can be used for compliance under section 111(d), EDF believes that determination has two important consequences for the development of emission guidelines for carbon pollution from power plants. First, it would be logically inconsistent and arbitrary for EPA to recognize that such mechanisms are available for

[30] 42 U.S.C. § 7411(a)(1) (emphasis added).

compliance while, at the same time, concluding that they cannot be considered in determining the BSER and establishing emission guidelines. Second, to the extent EPA's emission guidelines encourage or allow States to craft plans that incorporate averaging and trading programs, it would be arbitrary not to consider how such mechanisms would reduce the cost of achieving the degree of emission reduction required by the BSER (even if the BSER consisted of physical modifications adopted at individual sources, such as co-firing or CCS). Indeed, if EPA were to blind itself to those compliance mechanisms in assessing the costs of the BSER, it would likely produce an inaccurate and inflated cost estimate and establish standards that are far weaker than those that could be achieved in practice.

*4. EPA's emission guidelines must include binding emission limits.*

In the ANPR, EPA suggests that section 111(d) allows the Agency to decline to establish *any* quantitative emission limits at all for existing sources – and, similarly, allows the Agency to establish "non-binding" limits that States may depart from for virtually any reason. These suggested interpretations of the statute would completely controvert the well-established purpose of section 111(d) and upend over forty years of EPA precedent interpreting and applying this provision of the CAA.

As EPA first recognized when it issued its implementing regulations for section 111(d) in 1975, section 111(d) plainly contemplates a substantive role for EPA in determining the stringency of standards for existing sources. Under this statutory framework, the Agency determines the BSER for a given source category and specific pollutant, along with the concomitant degree of emission limitation achievable through the application of that system.[31] Following this initial determination, EPA may then approve a State plan as "satisfactory" *only if* it achieves the requisite degree of emission reductions, and otherwise complies with the requirements of the CAA.[32] A final rule that permits States to achieve anything less than maximum feasible control under section 111(d) would be inappropriate and unlawful, especially in this context, where the Agency is under an obligation to take meaningful action to address climate change.

For this reason, the suggestion in the ANPR that EPA possesses the discretion to set emission guidelines without binding, presumptive emission limits is incorrect. Under section 111(d)(1)(A), States must impose "standards of performance" on existing sources. The definition for "standard of performance" under this section provides those standards shall reflect "the degree of emission limitation achievable." An EPA Emission Guideline document that did not include emission limits would contradict the plain text of section 111(a)(1), which provides that the Administrator *shall* determine "the degree of emission limitation achievable." Since 1975, EPA's regulations implementing section 111(d) have recognized that emission guideline

[31] *See id.*

[32] EPA has previously determined that the statute unambiguously requires EPA to disapprove State plans if they do not achieve the adequate amount of emissions reduction that EPA sets in its guidelines. Conversely, EPA must approve a State plan so long as it meets all applicable requirements of the Act. EPA, Legal Memorandum Accompanying Clean Power Plan for Certain Issues at 22-28 (Aug. 2015) ("Thus, based on the dictionary meaning of 'satisfactory' and the structure of the Act, Congress has spoken directly to the issue. 'Satisfactory' means 'meet all applicable requirements of the Act.'"), Attachment L [Hereinafter "CPP Legal Memorandum"].

documents *must* include both a BSER determination and an emission guideline that reflects the degree of emission limitation achievable under the BSER.

Assuming that EPA appropriately sets a binding emission limit, it must not allow States to undermine that limit through unjustified use of the remaining useful life ("RUL") provision of section 111(d) or a variance under 40 C.F.R. § 60.24(f). Both provisions were designed to accommodate a narrow set of situations where an existing facility would be unreasonably forced to install expensive retrofit technology shortly before it is scheduled to retire. Moreover, neither provision displaces the clear statutory command that state and federal plans establish standards of performance that reflect the "best system." If EPA adopts some form of compliance flexibility in an emission guideline, such as crediting or trading, that kind of flexibility would allow sources to *avoid* expensive retrofits and obviate the need for a variance based on RUL. And if EPA determines such compliance flexibilities are not allowed as a result of its interpretation of the BSER, it must carefully delimit the use of the RUL and variance provisions – as it has done under other comparable provisions of the CAA – to ensure that State plans achieve emission reductions consistent with the "best system."

5. *EPA should provide for swift timelines for approving and implementing State plans, and should not weaken New Source Review requirements.*

The timeline for submission and approval of State plans under any replacement rule should reflect the need to act expeditiously given the pressing nature of climate change and should be no longer than the timeline in the CPP, if not substantially shorter. The CPP timeline, which EPA established in response to State input, allowed States ample time to design and submit their implementation plans. Many State employees responsible for designing State plans already have extensive experience implementing comparable clean air programs. The CPP's timeline was, if anything, more generous than analogous programs for which States have designed plans. Many States have already taken steps toward CPP compliance, allowing for greater efficiency in designing State plans to limit carbon pollution from the power sector.

Any replacement rule should additionally not make changes to weaken New Source Review ("NSR") requirements that protect communities from increases in harmful pollution resulting from modifications to major industrial facilities like power plants. In the CPP rulemaking, EPA correctly determined that NSR would not pose significant barriers to State implementation of the rule. In any case, any attempt to modify to NSR should occur through a separate rulemaking and be assessed on its own merits based on a full legal analysis and an assessment of its public health and environmental impacts. It is inappropriate to use a section 111(d) rulemaking as a vehicle to implement cross-cutting and potentially harmful changes to the time-tested protections in the NSR program.

## I. THE IMPACTS OF CLIMATE CHANGE ARE IMMINENT AND DIRE, AND THE CONTRIBUTION OF THE POWER SECTOR TO THESE HARMS UNDERSCORES THE URGENT NEED FOR ACTION.[33]

[33] This section responds to questions 2 and 5 from the ANPR. *See* 82 Fed. Reg. at 61,511.

Over the past decade, EPA has repeatedly recognized that climate change poses an urgent, immediate threat to the public health and welfare. In 2009, EPA determined, after reviewing a comprehensive and massive body of peer-reviewed scientific research on climate change, that heat trapping greenhouse gas emissions may reasonably be anticipated to endanger the public health and welfare of both current and future generations.[34] When promulgating the final CPP, EPA noted that scientific assessments since 2009 confirmed and strengthened the imperative to act quickly,[35] and explained "[w]e are now at a critical juncture to take meaningful action to curb the growth in $CO_2$ emissions and forestall the impending consequences of prior inaction. $CO_2$ emissions from existing fossil fuel-fired power plants are by far the largest source of stationary source emissions."[36] When EPA finalized the Oil and Gas Sector New Source Performance Standards for methane, the Agency reaffirmed the science behind the endangerment finding, explaining that recent scientific assessments "improve understanding of the climate system and strengthen the case that GHGs endanger public health and welfare both for current and future generations."[37] In August 2016, EPA finalized an additional endangerment finding for greenhouse gases from aircraft, reaffirming and reinforcing its conclusions regarding the urgency and severity of the threat that climate change poses to public health and welfare.[38] And in the January 2017 Denial of Petitions to Reconsider the Final CPP, EPA reiterated that climate change is "the nation's most urgent and important environmental challenge"[39] and that the body of scientific evidence supporting that conclusion continues to grow.[40]

Global carbon dioxide emissions, primarily from fossil fuel combustion, tripled from the 1960s to the period from 2007 to 2016, and account for approximately 82% of the increase in the radiative forcing over the past decade.[41] Fossil fuel combustion is therefore a primary driver of climate change. Likewise, any pathway towards reducing greenhouse gas emissions from the U.S. economy in a manner that will avoid the worst impacts of climate change relies heavily upon first reducing the carbon footprint of the power sector and, second, electrifying transportation and other major emitting sectors.[42] Reducing emissions from fossil fuel power

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[34] *See* Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496 (Dec. 15, 2009).
[35] CPP Final Rule at 64,675, 64,677, 64,684, 64,686.
[36] CPP Final Rule at 64,774.
[37] EPA, Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources, 81 Fed. Reg. 35,824 35,834, (June 3, 2016).
[38] EPA, Finding that Greenhouse Gas Emissions From Aircraft Cause or Contribute to Air Pollution That May Reasonably Be Anticipated to Endanger Public Health and Welfare, 81 Fed. Reg. 54,422 (Aug. 16, 2016).
[39] EPA, Basis for Denial of Petitions to Reconsider and Petitions to Stay the Clean Power Plan, 1 (Jan. 17, 2017), Attachment H [Hereinafter "CPP Reconsideration Denial"]; *see also* CPP Final Rule at 64,774, 64,937 (finding an "urgent need for actions to reduce GHG emissions").
[40] 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, Appendix 4 – Climate Science Update at 5 (Jan. 2017), Attachment K [Hereinafter "CPP Reconsideration Denial: Appendix 4"]. EPA relies, inter alia, on several National Research Council/National Academy of Science reports, on the IPCC 5th Assessment Report, and on the US Global Change Research Program (USGCRP) work done in 2016.
[41] WMO and Global Atmosphere Watch 2017, *The State of Greenhouse Gases in the Atmosphere Based on Global Observations through 2016*, 13 WMO Greenhouse Gas Bulletin (2017), https://library.wmo.int/opac/doc_num.php?explnum_id=4022.
[42] Union of Concerned Scientists, *Cleaner Cars from Cradle to Grave: How Electric Cars Beat Gasoline Cars on Lifetime Global Warming Emissions*, 2 (Nov. 2015), www.ucsusa.org/clean-vehicles/electric-vehicles/life-cycle-ev-emissions#.Wh8HVYanHcs.

plants is therefore an essential and urgent step towards reducing economy-wide carbon emissions.[43]

According to the most recent scientific assessment by the U.S. Global Change Research Program ("USGCRP") – published in November 2017 and cleared by EPA among other agencies – "there is no convincing alternative explanation" other than human activities for the observed climate warming over the last century.[44] Since 1901, U.S. annual average temperatures have increased by 1.8°F,[45] and eleven of the twelve hottest years on record since 1880 have occurred since 2003. Recent analyses have concluded that 2017 was the third-hottest year on record – only 2016 and 2012 were warmer.[46] Global average temperatures have similarly continued to rise, with 2017 being the second hottest year on record, behind only 2016.[47] Global sea levels have risen by more than 7 inches during this period, which increases the likelihood of flooding along the U.S. Coast,[48] and recent projections predict that global sea level could rise by more than 2 feet by 2100.[49] Recent studies have also linked climate change to an increase in the size and intensity of natural disasters such as hurricanes[50] and wildfires.[51]

Over the next few decades, the U.S. is expected to warm an additional 2.5°F on average.[52] Under the current trajectory of high carbon emissions, surface acidity in the oceans is projected to increase by another 100 to 150% by 2100.[53] And as temperatures continue to increase, there is a greater risk that that non-linear climate thresholds, or "tipping points," will

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[43] *See* The White House, *United States Mid-Century Strategy for Deep Decarbonization* 33-34 (Nov. 2016) (describing electricity "produced almost entirely from clean generation sources by 2050" and "broad utilization of clean electricity and low-carbon fuels" as central elements of a strategy to reduce net greenhouse gas emissions to 80% below 2005 levels by 2050).

[44] USGCRP, *Climate Science Special Report: Fourth National Climate Assessment, Volume I*, Wuebbles, D.J., D.W. Fahey, K.A. Hibbard, D.J. Dokken, B.C. Stewart, and T.K. Maycock (eds.), 10 (2017), https://science2017.globalchange.gov/downloads/CSSR2017_FullReport.pdf.

[45] USGCRP 2017 at 13.

[46] WMO and Global Atmosphere Watch 2017, *The State of Greenhouse Gases in the Atmosphere Based on Global Observations through 2016*, 13 WMO Greenhouse Gas Bulletin (2017), https://library.wmo.int/opac/doc_num.php?explnum_id=4022; Scott Waldman, *2017 Was the Third Hottest Year on Record*, Scientific American (Jan. 9, 2018), https://www.scientificamerican.com/article/2017-was-the-third-hottest-year-on-record-for-the-u-s/.

[47] NASA, *Long-term Warming Trend Continued in 2017: NASA, NOAA* (Jan. 18, 2018), Attachment S; NOAA, *Global Climate Report – Annual 2017* (Jan. 18, 2018), Attachment V; Berkeley Earth, *Global Temperature Report for 2017*, (Feb. 20, 2018), http://berkeleyearth.org/global-temperatures-2017/.

[48] USGCRP 2017 at 333.

[49] R. S Nerem et. al, *Climate-Change Driven Accelerated Sea Level Rise Detected in the Altimeter Era*, Proceedings of the National Academy of Sciences (Jan. 9, 2018), http://www.pnas.org/content/early/2018/02/06/1717312115#abstract-2.

[50] Emanuel, K., *Assessing the Present and Future Probability of Hurricane Harvey's Rainfall 2017*, PNAS Early Edition (2017), www.pnas.org/cgi/doi/10.1073/pnas.1716222114; Risser, M.D. and M.F. Wehner, "*Attributable Human-induced Changes in the Likelihood and Magnitude of the Observed Extreme Precipitation During Hurricane Harvey*, Geophys. Res. Lett. In Press, doi: 10.1002/2017GL075888; Van Oldenborgh, G.J., et al., *Attribution of Extreme Rainfall from Hurricane Harvey, August 2017*, 12 Environ. Res. Lett. 124009 (2017), https://doi.org/10.1088/1748-9326/aa9ef2.

[51] In the western U.S. human-caused climate change accounted for more than half of the observed increases in forest fuel aridity from 1979 to 2015. USGCRP 2017 at 231. Drying of forest fuels has helped increase the number of large fires and has contributed to a doubling in the fire area since the early 1980s. *Id.* at 243.

[52] USGCRP 2017 at 11.

[53] *Id.*

occur.[54] For example, increased rainfall and meltwater from the Arctic glaciers have the potential to slow a major ocean current. If that current slows or collapses, the northeastern U.S. will see a dramatic increase in regional sea levels of as much as 1.6 feet.[55]

Climate change is already affecting the health of Americans, and will continue to pose a serious threat unless action is taken to dramatically limit greenhouse gas emissions.[56] Heat related deaths are likely to increase as a result of climate change, and are likely to be larger than the corresponding decrease of cold related deaths.[57] Air quality is likely to worsen as a result of an increased ground-level ozone pollution, increased particulate matter pollution from wildfires, and longer and more severe pollen and mold allergy seasons.[58]

As EPA and other federal agencies have recognized previously, climate change poses an enormous threat to the U.S. economy.[59] A September 2017 analysis by the GAO evaluating recent studies and expert assessments of the economic impacts of climate change for the U.S., concluded that "climate change could result in significant economic effects in the United States, and the studies indicated that these effects will likely increase over time for most of the sectors analyzed."[60] A Rhodium Group study evaluated by GAO concluded that climate change will result in almost $55 billion in annual economic costs for the United States alone between 2020 and 2039, rising to $1.04 *trillion* in annual costs between 2080 and 2099.[61] EPA's 2015 report on the economic impacts of climate change found that the projected benefits of mitigation were substantial for many sectors.[62] For example, mitigation would result in a cost-savings of $4.2-7.4 billion simply from avoided road maintenance.[63] Mitigation would also result in an estimated 57,000 fewer deaths from poor air quality in 2100, an estimated $10-34 billion in savings on power system costs in 2050, an estimated $6.6-11 billion in avoided damages to agriculture in 2100, and an estimated $11-180 billion in avoided damages from water shortages in key economic sectors in 2100.[64]

EPA has not changed its prior position concerning the urgency and severity of the harmful impacts of climate change, nor could it provide a reasoned basis for doing so. And in the ANPR, EPA fails to consider or even acknowledge the vast array of evidence supporting the urgent need for action on climate change. In light of the overwhelming evidence that climate

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[54] *Id.* at 411.
[55] *Id.* at 418.
[56] USGCRP, *The Impacts of Climate Change on Human Health in the United States: A Scientific Assessment*, Crimmins, A., J. Balbus, J.L. Gamble, C.B. Beard, J.E. Bell, D. Dodgen, R.J. Eisen, N. Fann, M.D. Hawkins, S.C. Herring, L. Jantarasami, D.M. Mills, S. Saha, M.C. Sarofim, J. Trtanj, and L. Ziska (eds.) (2016).
[57] *Id.* at 30.
[58] *Id.* at 71-75.
[59] EPA, Climate Change In the United States: Benefits of Global Action, (Aug. 3, 2015), https://19january2017snapshot.epa.gov/cira/downloads-cira-report_.html.
[60] GAO, *Climate Change: Information on Potential Economic Effects Could Help Guide Federal Efforts to Reduce Fiscal Exposure*, 19 (Sept. 2017).
[61] *Id.* at 20 (citing Rhodium Group, *American Climate Prospectus: Economic Risks in the United States* (Oct. 2014)). The aggregate costs reported above reflect the sum of the individual costs presented in Table 1 of the GAO report.
[62] EPA, Climate Change In the United States: Benefits of Global Action, at 6.
[63] *Id.*
[64] *Id.* at 8-9.

change represents an immediate and dire threat to the public health and welfare, EPA's efforts to frustrate and undo the CPP are unconscionable – and an abdication of EPA's responsibility to protect the public under the CAA.

## II. REPEALING THE CLEAN POWER PLAN WITHOUT AN IMMEDIATE AND SATISFACTORY REPLACEMENT WOULD VIOLATE EPA'S AFFIRMATIVE OBLIGATION TO PROTECT THE PUBLIC FROM CARBON POLLUTION FROM POWER PLANTS.[65]

As explained below, EPA has a manifest obligation to limit climate pollution from existing power plants under section 111(d) of the CAA. Despite that obligation, the ANPR makes clear that Administrator Pruitt is proposing to repeal the CPP without even committing to promulgate a meaningful replacement – much less providing a timeline for doing so. Indeed, the ANPR states that the Administrator merely "continues to consider the possibility of replacing certain aspects of the CPP," and repeatedly refers to the replacement as a "potential" or "possible" rule.[66] The CAA, however, provides no room for Administrator Pruitt's prevarication over whether he will fulfill his legal obligation under section 111(d). If Administrator Pruitt repeals the CPP, and does so without *first* having promulgated strong substitute emission guidelines to limit carbon pollution from power plants, the Agency would unlawfully be in default of its affirmative obligation to protect Americans from this pollution.

### A. Repealing the Clean Power Plan Would Leave EPA in Default of Its Statutory Obligation to Limit Harmful Climate Pollution from Existing Power Plants.

The ANPR utterly fails to recognize that repealing the CPP *without* a replacement would leave EPA in default of its section 111(d) obligation to limit harmful climate pollution from existing power plants. The CAA mandates the regulation of dangerous air pollutants emitted from major stationary sources. Section 111(b) of the Act directs EPA to identify categories of stationary sources that "cause[], or contribute[] significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare."[67] Power plants have been listed since 1971 as such a source category that contributes significantly to dangerous air pollution.[68] After listing a category, EPA must set standards of performance for those sources (also known as New Source Performance Standards) covering new and modified sources under section 111(b).

Section 111(d) directs EPA to issue regulations that establish a State implementation process to address emissions of "any air pollutant" that would be regulated under section 111(b) if emitted from a new source.[69] EPA issued framework regulations in 1975,[70] which provide that, after promulgation of a New Source Performance Standard for new sources in a listed category,

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[65] This section responds to questions 2 and 5 from the ANPR. *See* 82 Fed. Reg. at 61,511.
[66] 82 Fed. Reg. at 61,508/1; 61,509/1; 61,510/1; 61,510/3; 61,511/1; 61,511/2; 61,512/1; 61,512/2; 61,513/1; 61,517/3; 61,518/3.
[67] 42 U.S.C. § 7411(b)(1)(A).
[68] *See* Air Pollution Prevention and Control: List of Categories of Stationary Sources, 36 Fed. Reg. 5,931 (Mar. 31, 1971).
[69] 42 U.S.C. § 7411(d)(1).
[70] 40 Fed. Reg. 53,340 (Nov. 17, 1975); *see* 40 C.F.R. Subpart B.

EPA must issue an "emissions guideline" that reflects the application of BSER that has been adequately demonstrated for existing sources. States must submit to EPA for approval their plans establishing standards of performance (called "emission standards" in the regulations) that incorporate EPA's emissions guideline, or that set more protective standards.[71]

In *Massachusetts v. EPA*, the Supreme Court held that "EPA has the statutory authority to regulate the emission of [greenhouse] gases," because they "fit well within the Clean Air Act's capacious definition of an 'air pollutant.'"[72] The Court ordered EPA to make a science-based determination as to whether those pollutants endanger public health and welfare, determining that "the Clean Air Act requires the Agency to regulate emissions" of gases contributing to climate change if there is an endangerment finding.[73] The Court made clear that EPA was required to determine – based on scientific factors, not policy preferences – whether climate pollution endangers public health or welfare. And if so, EPA was required to act.

As discussed in section I above, EPA concluded in 2009 that greenhouse gases "endanger human health and welfare."[74] On review, the D.C. Circuit firmly rejected all challenges to EPA's endangerment finding.[75] Since 2009, the literature on climate change and evidence of *current* climate impacts has continued to develop and increase, further buttressing the rigor of the endangerment finding and the urgency of the climate change threat.[76]

Meanwhile, EPA's legal authority and obligation to regulate climate pollution emissions under the CAA have been affirmed twice more by the Supreme Court. In *American Electric Power v. Connecticut*, the Supreme Court found that section 111 of the CAA "speaks directly" to the regulation of climate pollution from existing power plants.[77] Even opponents of climate protections conceded that point during oral argument on June 20, 2011.[78] The Court again recognized EPA's authority and obligation to regulate climate pollution in a third decision, *Utility Air Regulatory Group v. EPA*.[79]

In 2015, EPA determined that it was appropriate to regulate carbon pollution from new, modified, and reconstructed fossil fuel-fired power plants because of the extraordinary contribution that these sources make to dangerous climate-destabilizing pollution.[80] This determination, which was supported by overwhelming record evidence that EPA has not

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[71] 40 C.F.R. §§ 60.22-60.24.
[72] *Massachusetts v. EPA*, 549 U.S. 497, 532 (2007).
[73] *Id.* at 533.
[74] *See* 74 Fed. Reg. 66,496 (Dec. 15, 2009).
[75] *Coal. for Responsible Regulation, Inc. v. EPA*, 684 F.3d 102, 118-19 (D.C. Cir. 2012).
[76] *See* Section I.
[77] *Am. Elec. Power Co. v. Connecticut*, 564 U.S. 410, 424 (2011).
[78] *See id.* (oral argument).
[79] *Util. Air Regulatory Grp. v. EPA*, 134 S. Ct. 2427, 2448 (2014) (holding that greenhouse gas emissions from sources required to obtain Prevention of Significant Deterioration (PSD) permits are subject to "best available control technology" (BACT) limitations). *See also* Order, *West Virginia v. EPA*, 15-1363, ECF No. 1687838, at 2 (Aug. 8, 2017) (Cir. Judges Tatel and Millett concurring) (recognizing that the Endangerment Finding "triggered an affirmative statutory obligation to regulate greenhouse gases").
[80] Standards of Performance for Greenhouse Gas Emissions From New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units, CPP Final Rule at 64,510, 64,530 (Oct. 23, 2015).

proposed to disturb,[81] creates a binding obligation under section 111(d) to issue emission guidelines for carbon pollution from existing power plants.

Insofar as it suggests that EPA could choose to repeal the CPP without issuing a replacement, the ANPR incorrectly ignores EPA's legal obligations under section 111(d). With EPA's obligation to regulate GHGs as an air pollutant firmly established, any action by the Administrator to repeal the CPP without putting in place a lawful replacement would be unlawful, arbitrary, and capricious. The duty assigned to the Agency by section 111, the listing of power plants as a source category, and the endangerment finding as to greenhouse gases create a mandate for EPA to address carbon pollution from existing power plants.

### B. Repealing the Clean Power Plan Without Simultaneously Promulgating a Replacement Would Violate the CAA.

Given the statutory mandate just discussed, EPA cannot repeal the CPP without simultaneously promulgating a replacement that likewise fulfills that mandate. Doing so would be directly contrary to the requirements of section 111 and EPA's obligations to protect public health and the environment under the CAA. Nor does any other provision of the CAA authorize such abdication of EPA's statutory obligations. To the contrary, the statutory text suggests that Congress did not grant EPA authority to create a regulatory gap. This has clear implications for the timing of any rulemaking that flows from this ANPR: EPA *cannot* repeal the CPP without having completed its consideration of the issues raised in the ANPR and promulgated a lawful replacement that ensures EPA's section 111 obligations are fulfilled.

CAA Section 301's "gap filling" provision does not provide authority for EPA to create a regulatory vacuum by repealing the CPP without a simultaneous replacement. Section 301 provides that "[t]he Administrator is authorized to prescribe such regulations subject to section 307(d) [42 U.S.C. § 7607(d)] as are necessary to carry out his functions under this Act."[82] Importantly, section 301 does not authorize EPA to promulgate a rule that is inconsistent with the Act's "clear statutory command" in section 111.[83] Here, repealing the CPP without an alternative that likewise fulfills the Agency's statutory obligations would conflict with section 111's "clear statutory command." Moreover, here, there is simply no "gap" to fill. Section 111 clearly spells out the Agency's affirmative obligations.[84]

Indeed, the text of the CAA suggests that Congress did not authorize the Agency to allow a gap in fulfilling a statutory mandate in order for the Agency to further deliberate about how to best fulfill that mandate – i.e., to take a rule off the books, either temporarily or permanently, without replacing it. The CAA is quite clear that apart from limited exceptions under

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[81] 82 Fed. Reg. at 61509 n.3 ("Nothing in this ANPRM should be construed as addressing or modifying the prior findings made under titles I and II of the CAA discussed in the preceding paragraphs with respect to endangerment and the requirements under 111.").
[82] 42 U.S.C.S. § 7601(a)(1).
[83] *See Natural Res. Def. Council v. Reilly*, 976 F.2d 36, 41 (D.C. Cir. 1992) (concluding that section 301 did not provide EPA with authority to suspend a regulation while it reconsidered it).
[84] *See Natural Res. Def. Council v. EPA*, 749 F.3d 1055, 1064 (D.C. Cir. 2014) ("Those precedents establish a simple and sensible rule: EPA cannot rely on its gap-filling authority to supplement the Clean Air Act's provisions when Congress has not left the agency a gap to fill.").

circumstances not present here, promulgated regulations shall go into effect even though those regulations might be changed through agency reconsideration or even vacated as unlawful upon judicial review. Section 307(b)(1) – the Act's judicial review provision – mandates that "[t]he filing of a petition for reconsideration by the Administrator of any otherwise final rule or action shall not affect the finality of such rule or action . . . *and shall not postpone the effectiveness* of such rule or action.[85] And the Act's administrative reconsideration provision directs that "such reconsideration *shall not postpone the effectiveness* of the rule."[86] It is difficult to see how Congress could have been clearer that it intended duly promulgated rules that protect health and welfare to take effect – and stay in effect – even when undergoing judicial review, or when the Agency might intend to revise them through reconsideration proceedings.

Finally, EPA's course of conduct in the legal challenges to the CPP and its subsequent rulemakings only reinforces its obligation to refrain from repealing the CPP until it is prepared to replace it. Because of the Supreme Court's stay pending review, no entity is harmed by the CPP remaining on the books until it is replaced. At the same time, no court has declared the CPP unlawful, and EPA has striven mightily to ensure that no court reaches the merits of the challenges to the CPP. If EPA's repeal rule is based upon EPA's belief that the CPP is *unlawful*, then EPA should have welcomed the court's adjudication of the merits of the CPP. The fact that it did not, suggests that rather than believing that the CPP is unlawful, EPA merely believes that a different policy is *preferable*. It is counter to the statutory text and arbitrary for EPA to voluntarily repeal the CPP, leaving a long-neglected and critical provision of the CAA unheeded, while EPA mulls a potential replacement. In other words, EPA's course here is illogical: if the CPP is unlawful, EPA should allow the courts to say so secure in the knowledge that if they do no entity would be required to comply with an unlawful rule. But if the CPP is not unlawful, it is both contrary to the statutory *mandate* to protect human health and welfare from power plant pollution and arbitrary and capricious to repeal it without a replacement that fulfills the statutory mandate. To voluntarily leave the public unprotected from pollution that harms public health and welfare, solely because the Agency desires to effectuate a different reading of the CAA or implement its statutory duties in a different way, is contrary both to the express mandatory language in section 111(d) and the CAA's overarching purpose "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."[87]

## III. BECAUSE THE CLEAN POWER PLAN IS READILY ACHIEVABLE AND COST-EFFECTIVE, THE ONLY REASONABLE PATH FOR A REPLACEMENT RULE WOULD BE TO ADOPT MORE PROTECTIVE AND ACCELERATED EMISSION REDUCTION TARGETS.[88]

When EPA finalized the CPP in 2015, it established emission guidelines based "in large part on already clearly emerging growth in clean energy innovation, development, and

[85] 42 U.S.C. § 7607(b)(1) (emphasis added).
[86] *Id.* §7607(d)(7)(B) (emphasis added); *see also id.* § 7411(e) ("After the effective date of standards of performance promulgated under this section, it shall be unlawful for any owner or operator of any new source to operate such source in violation of any standard of performance applicable to such source").
[87] 42 U.S.C. § 7401(b)(1).
[88] This section responds to questions 2 and 3(a) from the ANPR. *See* 82 Fed. Reg. at 61,511.

deployment."[89] Since 2015, these trends have continued, making the achievement of the CPP's emission targets and significant benefits even less costly than originally contemplated. In fact, in 2016, power sector carbon pollution emissions were at 1,821 million metric tons, or 25% below 2005 levels – nearly 80% of the way towards attaining EPA's emission reduction target of 32% below 2005 levels by 2030.[90] And in the first 10 months of 2017, power sector carbon pollution emissions were 4% lower compared to the same period in 2016.[91] These developments show that the CPP sets conservative, eminently achievable carbon pollution limits while providing certainty regarding future emission reductions that market trends alone cannot deliver. The rapid progress in emission reductions also indicates the need to *strengthen* the CPP; indeed, its national regulatory framework is ready-made to enable "target ratcheting as energy prices, technology costs and baseline emissions projections changed."[92]

If the EPA proceeds with a rulemaking to replace the CPP, it must take into account these recent trends and the eminent feasibility and cost-effectiveness of achieving *deeper* reductions than required by the CPP. Indeed, the trends described below – and the severity and urgency of the threats posed by climate change - underscore that it would be manifestly arbitrary and unreasonable for the Agency to adopt standards that fail to achieve at least the level of emission reduction assured by the CPP.

### A. Recent Analyses Confirm that the Clean Power Plan Targets Can Be Readily Achieved at Significantly Less Cost Than Originally Projected.

The final CPP established carbon pollution limits that phased in gradually, with full compliance not required until 2030, and afforded States significant compliance flexibility to meet these goals. EPA estimated that annual compliance costs in 2030 would be between $5.1 and $8.4 billion – a small fraction of the approximately $180 billion in total generating costs for the electric sector that were projected in 2030.[93] By comparison, EPA estimated that the CPP would generate between $32 and $54 billion in annual climate and health benefits in 2030, far outweighing the rule's compliance costs.[94] These benefits represent tangible improvements in the health and well-being of Americans across the country: EPA's Regulatory Impact Analysis for the CPP estimated that the policy would avoid up to 3,600 premature deaths, 90,000 childhood asthma attacks, and hundreds of thousands of lost school and work days each year.[95]

In its January 2017 Reconsideration Denial, EPA recognized that market trends in the power sector have continued to drive carbon pollution reductions in the period since the CPP was

[89] CPP Final Rule at 64,662.
[90] U.S. Energy Information Administration, Monthly Energy Review (Jan. 2018).
[91] *Id.*
[92] Larsen *et al.*, Rhodium Group, *What the CPP Would Have Done* (Oct. 2017).
[93] EPA, Regulatory Impact Analysis for the Clean Power Plan Final Rule [Hereinafter "CPP RIA"] EPA estimated costs assuming two different compliance frameworks, reflecting the flexible compliance options the final rule provided to states. The $5.1 billion estimate assumes that all states adopt a mass-based compliance framework and the $8.4 billion estimate assumes that all states adopt a rate-based compliance framework.
[94] *Id.*
[95] *Id.*

finalized.[96] These trends include declining coal generation and increased renewable energy and natural gas generation – driven in large part by improving wind and solar economics, the renewable energy tax credit extensions, and low natural gas prices – in addition to increased demand-side energy efficiency.[97] EPA concluded that those power sector trends "allow states and sources to implement the CPP and achieve its goals more readily than originally projected" and "at very low costs."[98]

A recent report by the Institute for Policy Integrity also highlights the declines in power sector carbon pollution emissions and the concomitant decreases in CPP compliance costs.[99] The report presents several recent economic analyses conducted by independent, non-governmental entities that estimate substantially lower compliance costs than EPA projected in 2015. For instance, a June 2016 analysis by M.J. Bradley & Associates, using the same electric sector model as EPA but updating several inputs to account for recent developments, found that compliance would cost up to 84% less than EPA originally estimated.[100] Another analysis by the American Petroleum Institute – also using the same electric sector model as EPA – projected that one compliance scenario would impose no costs in 2030, while another would cost 40% less than EPA's 2015 estimate.[101]

These analyses all indicate that the gap between projected emissions with and without the CPP has narrowed substantially since 2015 and the costs of compliance are much lower than previously anticipated. They are additional evidence that the CPP could have been *stronger,* and that the only reasonable course for EPA – if it proceeds with a rulemaking to replace the CPP – is to fortify the CPP with more ambitious emission reduction targets.

### B. Power Sector Trends Show Continued Decline in Coal-Fired Generation and Increased Retirements.

The low and falling costs of compliance for the CPP are no surprise in light of recent trends in the power sector, which show a persistent decline in coal generation and an ongoing shift towards a cleaner energy resource mix, driven in large part by low natural gas prices and improving wind and solar economics.

In fact, according to M.J. Bradley & Associates, in 2016, U.S. coal generation dropped to its lowest levels since the early 1980s, reaching 30% of total generation compared to 50% of

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[96] 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, Appendix 2 – Power Sector Trends (Jan. 2017), Attachment I, [Hereinafter "CPP Reconsideration Denial: Appendix 2"].
[97] *Id.*
[98] *Id.* at 42.
[99] Denise A. Grab *et al.*, Institute for Policy Integrity, New York University School of Law, *The Falling Cost of Clean Power Plan Compliance* (Oct. 2017), Attachment P.
[100] *Id.*; *see also* M.J. Bradley & Associates, *EPA's Clean Power Plan: Summary of IPM Modeling Results with ITC/PTC Extension* (June 2016), Attachment R.
[101] *See* Denise A. Grab *et al.*, Institute for Policy Integrity New York University School of Law, *The Falling Cost of Clean Power Plan Compliance* (Oct. 2017), Attachment P; *see also* American Petroleum Institute, Natural Gas Solutions: Power Generation, *EPA Clean Power Plan Compliance Pathways – Modeled Generation, Capacity and Costs* (2016).

total generation in 2005.[102] For the first time, in 2016, natural gas was the leading source of electricity generation at 34% of total generation.[103] That same year, the U.S. coal fleet operated at 53% utilization rate while natural gas combined cycle plants operated at an average capacity factor of 56%.[104]

Coal-fired units have also continued to retire at a rapid pace. Since 2010, more than 100 GW of U.S. coal capacity has announced plans to retire[105] – this represents almost one-third of all U.S. coal capacity, and most of these announced closures have already taken place. As of June 2017, nearly 63 GW of coal capacity has retired.[106] Most of these retiring plants are very old, and aging out of the coal-fleet will continue in the near future.[107] Meanwhile, renewable energy development has continued to surge. According to the Columbia University Center on Global Energy Policy, the increased competition from cheap natural gas has been by far the major contributor to the decline in U.S. coal generation – accounting for 49% of the decline.[108] Reduced demand for electricity and the growth of renewables accounted for 26% and 18% of the reduction in coal generation, respectively.[109]

### C. Costs of Renewable Energy Are Declining and Its Use Is Expanding.

The costs of wind and solar technologies have fallen dramatically in recent years. In many places, these zero emissions resources are out-competing fossil fuel-based electricity generation. According to the investment firm Lazard, the cost of generating power from new wind and solar projects has declined by 67% and 86%, respectively, since 2009.[110] In the past two years since the CPP was finalized, according to the same analysis, the cost of wind and solar power has fallen by 17% and 22%, respectively. Indeed, the average price of wind power

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[102] M.J. Bradley & Associates, *Coal-Fired Electricity Generation in the United States and Future Outlook* (Aug. 2017), Attachment Q.
[103] *Id.*
[104] *Id.*
[105] Since January this year, about 10 large coal plants have announced plans to close. See *Id.* at 1-2.
[106] *Id.*
[107] *See id.* at 4 (On average, units that announced plans to retire between 2010 and 2015 were 57 years old).; *see also* Declaration of Kevin P. Culligan in the D.C. Circuit opposing the CPP stay at 15 (citing aging out as the second factor, after natural gas prices, driving the shift away from coal towards a cleaner resource mix: "In the nearly five years preceding signature of the Rule, the average age of a retiring coal plant was 55 years old."), https://www.edf.org/sites/default/files/content/epas_response_in_opposition_to_motions_to_stay_cpp.pdf.
[108] Houser *et al.*, Columbia University School of International and Public Affairs Center on Global Energy Policy, *Can Coal Make a Comeback?* (Apr. 2017), http://energypolicy.columbia.edu/sites/default/files/Center%20on%20Global%20Energy%20Policy%20Can%20Coal%20Make%20a%20Comeback%20April%202017.pdf; *see also* Hibbard *et al.*, Analysis Group, *Electricity Markets, Reliability and the Evolving U.S. Power System* (June 2017), http://www.analysisgroup.com/uploadedfiles/content/insights/publishing/ag_markets_reliability_final_june_2017.pdf; *see also* Chang *et al.*, The Brattle Group, *Advancing Past "Baseload" to a Flexible Grid: How Grid Planners and Power Markets Are Better Defining System Needs to Achieve a Cost-Effective and Reliable Supply Mix*, (June 2017), http://www.brattle.com/system/publications/pdfs/000/005/456/original/Advancing_Past_Baseload_to_a_Flexible_Grid.pdf?1498246224.
[109] *See* Chang et al, *supra* note 108.
[110] Lazard, *Lazard's Levelized Cost of Energy Analysis – Version 11.0* (Nov. 2017), https://www.lazard.com/media/450337/lazard-levelized-cost-of-energy-version-110.pdf.

dropped to just $20 per megawatt-hour in 2016.[111] In 2017, the Department of Energy ("DOE") announced that the solar industry had hit the Sunshot target for utility-scale projects – an installation cost of $1 per watt – three years ahead of schedule.[112] When Xcel Energy put out its request for proposals in Colorado in 2017, it received an unprecedented amount of renewable energy bids, with a median bid price for wind of $18.10/MWh and a median for wind plus storage of $21/MWh – cheaper than the operating cost of all existing coal plants in Colorado.[113] Meanwhile, the median bid for solar was $29.50/MWh and the median for solar plus storage was $36/MWh – cheaper than 75% of Colorado's operating coal capacity.[114]

The policy landscape for wind and solar technologies has also changed considerably. In December 2015, four months after EPA finalized the CPP, Congress passed legislation that extended the Production Tax Credit for wind projects and the Investment Tax Credit for solar projects, placing both credits on a phase-down schedule.[115] At the State level, several States have also strengthened their Renewable Portfolio Standards in 2015 and 2016.[116]

These improving wind and solar economics, along with federal and State policy support and changing consumer preferences, have continued to drive renewable energy deployment well after the CPP was finalized. Together, wind and solar accounted for 63% of utility-scale capacity additions in 2016.[117] The U.S. solar industry alone added over 10 GW of solar capacity in 2016, a new annual record and double the capacity added in 2015.[118] Wind energy has experienced similar record growth and now has an installed capacity of more than 80 GW.[119]

Preliminary data from the Federal Energy Regulatory Commission ("FERC") also show continued deployment of wind and solar in 2017, with nearly 12 GW of new installed wind and solar capacity – roughly 50% of the total utility-scale capacity additions.[120] The Energy Information Administration ("EIA") expects renewable energy generation to increase from 15% of total generation in 2016 to about 17% in 2017.[121] By comparison, EPA's modeling of the final

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[111] Lawrence Berkeley National Laboratory, *2016 Wind Technologies Market Report* (Aug. 2017), https://emp.lbl.gov/sites/default/files/2016_wind_technologies_market_report_final_optimized.pdf.
[112] National Renewable Energy Laboratory, *U.S. Solar Photovoltaic System Cost Benchmark: Q1 2017*, (Sept. 2017), https://www.nrel.gov/docs/fy17osti/68925.pdf.
[113] *See* David Roberts, *In Colorado, A Glimpse of Renewable Energy's Insanely Cheap Future*, Vox (Jan. 16, 2018), https://www.vox.com/energy-and-environment/2018/1/16/16895594/colorado-renewable-energy-future.
[114] *Id*.
[115] As part of *The Consolidated Appropriations Act of 2016*, the Production Tax Credit (PTC) for onshore wind projects was extended at its full value of 2.3 cents/kWh through the end of 2016, and then will phase down to 80% of its full value in 2017, 60% in 2018, and 40% in 2019. The Investment Tax Credit (ITC) for solar projects was extended at its full value of 30% of project investment costs through the end of 2019, and will drop to 26% in 2020 and 22% in 2021. Without additional legislation, the PTC will expire after 2019, and after 2021, the ITC will drop to 10% of investment costs for utility-scale and commercial projects and will expire for residential projects.
[116] Lawrence Berkeley National Laboratory, *Renewable Portfolio Standards: 2017 Annual Status Report*, (July 2017) https://emp.lbl.gov/sites/default/files/2017-annual-rps-summary-report.pdf.
[117] Denise A. Grab *et al.*, Institute for Policy Integrity New York University School of Law, *The Falling Cost of Clean Power Plan Compliance* (Oct. 2017).
[118] *Id.*
[119] *Id.*
[120] Federal Energy Regulatory Commission, *Office of Energy Projects Energy Infrastructure Update For December 2017*, https://www.ferc.gov/legal/staff-reports/2017/dec-energy-infrastructure.pdf.
[121] *See* U.S. Energy Information Admin., *Short-Term Energy Outlook* (Feb. 6, 2018), https://www.eia.gov/outlooks/steo/report/electricity.php.

Clean Power Plan projected 21% renewable generation in 2030 under the CPP.[122] Indeed, recent modeling by M.J. Bradley & Associates shows that in 2030, renewable energy capacity is expected to reach levels consistent with projections under the CPP, even in the reference case without the CPP.[123] This provides further evidence that even deeper emission reductions than those required by the CPP are both feasible and cost-effective.

### D. Energy Efficiency Remains the Most Cost-effective Resource and Its Use Is Expanding.

In the CPP, EPA anticipated that entities would comply partly through investments in demand-side energy efficiency, a highly cost-effective means for reducing carbon pollution emissions from the power sector.

Demand-side energy efficiency measures help consumers save electricity, resulting in lower electric bills, less pollution, and a more reliable electric grid. Investments in energy efficiency are largely offset by the resulting electricity savings. In fact, analysis by the World Resources Institute found that State efficiency programs regularly save $2 for every $1 invested, and in some cases up to $5 for every $1 invested.[124]

States and consumers have continued to invest in energy efficiency programs in recent years, decreasing electric demand and contributing to the recent decline in power sector emissions. In 2015, State energy efficiency programs saved more than 26 million MWh – almost twice the amount saved in 2010.[125] Those savings were equivalent to almost one percent of total U.S. electric demand for 2015.[126]

A number of studies also show that there is ample room for energy efficiency programs to continue expanding. According to DOE's Lawrence Berkley National Laboratory ("LBNL"), aggressive deployment of economically cost-effective energy efficiency measures could reduce annual energy demand in the Western Interconnection by 18% in 2021 relative to a business as usual scenario.[127] For 2032, LBNL found technical potential for a 22% decrease in electricity demand above and beyond savings that would occur as a result of energy efficiency programs that are already in place.[128] A report by the National Academy of Sciences also found that 25 to 30% energy savings for the building sector could be achieved between 2030 and 2035 at a cost of just 2.7 cents per kWh saved.[129]

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[122] CPP RIA.
[123] M.J. Bradley & Associates, *EPA's Clean Power Plan: Summary of IPM Modeling Results with ITC/PTC Extension* (June 2016).
[124] *See* World Resources Institute, *Seeing Is Believing: Creating a New Climate Economy in the United States*, (Oct. 2014), http://www.wri.org/publication/seeing-believing-creating-new-climate-economy-united-states.
[125] Denise A. Grab *et al.*, Institute for Policy Integrity New York University School of Law, *The Falling Cost of Clean Power Plan Compliance* (Oct. 2017).
[126] *Id.*
[127] *See* Galen Barbose et al., *Incorporating Energy Efficiency into Western Interconnection Transmission Planning*, 19, 36 (Feb. 2014).
[128] *Id.*
[129] America's Energy Future Panel on Energy Efficiency Technologies, *Real Prospects for Energy Efficiency in the United States*, 7-8, 15-16 (2010).

These trends underscore that energy efficiency investments will continue to play a major role in decarbonizing the power sector, and that tremendous potential exists to further tap these cost-effective opportunities. Although EPA determined in the CPP that energy efficiency should not be part of the BSER for carbon pollution from existing power plants – a determination we do not question here – the increasing deployment of energy efficiency has positive implications for the overall cost and feasibility of achieving even deeper reductions than the CPP.

### E. Power Sector Companies and States Continue Momentum on Clean Energy.

Not only are market trends driving a reduction in fossil fuel-fired generation and increases in zero- or lower-emitting generation, but States and companies with an interest in reducing carbon pollution have taken steps to decarbonize their generating fleets through measures that are consistent with the CPP BSER.

Even during the current Administration, executives at a significant number of electric power companies that own or operate affected generating units have committed to continue deploying clean energy resources that reduce carbon dioxide emissions. Power companies owning more than 19.7% of U.S. generating capacity announced significant new renewable energy projects or carbon reduction commitments in 2017.[130] For instance, Duke Energy (with an overall portfolio of 52,700 MW) plans to reduce carbon emissions by 40% below 2005 levels by 2030.[131] Xcel Energy (17,000 MW) plans to reduce carbon emissions 60% by 2030 below 2005 levels.[132] DTE Energy (11,000 MW) plans to reduce carbon emissions 80% by 2050,[133] and Southern Company (46,000 MW) plans to construct 3,000 MW of new wind projects between 2018 and 2020.[134] And in 2018, American Electric Power set a goal to cut carbon emissions by 60% from 2000 levels by 2030 and 80% from 2000 levels by 2050,[135] while PPL Corporation announced a goal to cut the company's carbon dioxide emissions 70% from 2010 levels by 2050.[136]

Power company executives cite the falling cost of cleaner resources, changing consumer and investor preferences for clean energy, and environmental concerns as the major reasons for

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[130] Estimated from generating capacities of American Electric Power, Dominion, DTE, Duke Energy, Great River Energy, MidAmerican, NextEra, PacifiCorp, Portland General Electric, Southern Company, and Xcel Energy, against total installed U.S. generating capacity. *See* Edison Electric Institute, *Industry Data*, http://www.eei.org/resourcesandmedia/industrydataanalysis/industrydata/Pages/default.aspx.

[131] Dylan Brown, *Duke Stays Course on CO2 Cuts Despite Trump Politics*, Greenwire, (Apr. 27, 2017), https://www.eenews.net/greenwire/2017/04/27/stories/1060053707.

[132] Ben Fowke, *At Xcel, We'll Stay on a Clean Energy Path*, StarTribune, (June 14, 2017), http://www.startribune.com/at-xcel-we-ll-stay-on-a-clean-energy-path/428513313/.

[133] Hannah Northey, *Mich. Utility to Close Power Plants, Slash Emissions*, E&E News, (May 16, 2017), https://www.eenews.net/eenewspm/2017/05/16/stories/1060054642.

[134] Southern Company, *Southern Company Subsidiary Announces Strategic Wind Development Agreement*, PR Newswire, (Dec. 30, 2016), https://www.prnewswire.com/news-releases/southern-company-subsidiary-announces-strategic-wind-development-agreement-300384200.html.

[135] American Electric Power, *AEP's Clean Energy Strategy Will Achieve Significant Future Carbon Dioxide Reductions*, PR Newswire, (Feb. 6, 2018), https://seekingalpha.com/pr/17066680-aeps-clean-energy-strategy-will-achieve-significant-future-carbon-dioxide-reductions.

[136] PPL Corporation, *PPL Corporation sets goal to reduce carbon dioxide emissions*, PR Newswire, (Jan. 30, 2018), https://www.prnewswire.com/news-releases/ppl-corporation-sets-goal-to-reduce-carbon-dioxide-emissions-300590222.html.

these changes. For example, NextEra Energy (45,900 MW capacity) Chief Financial Officer John Ketchum has reported that "[w]e anticipate that improved wind and solar economics and low natural gas prices will continue to lead to additional retirements of coal, nuclear and less fuel-efficient oil and gas-fired generation units, creating significant opportunities for renewables growth going forward."[137] Southern California Edison has stated that it "will maintain an active role in supporting California's efforts to reduce greenhouse gas emissions, including support for renewable energy, transportation electrification, energy efficiency and innovative, clean energy technologies."[138] Exelon Corporation has said that "our customers want reliable, clean and affordable electricity and Exelon remains committed to helping drive the national transition to a low-carbon future."[139] And according to Calpine Corporation, carbon pollution reduction is consistent with the company's core principles and "makes a lot of business sense for us."[140]

States across the U.S. have also enacted *new* commitments to reduce carbon dioxide emissions under this Administration. These commitments include initiatives that span multiple States and large swathes of the U.S. population. For instance, the U.S. Climate Alliance reports, that at the time it published its report at the beginning of 2017, the fourteen States and Puerto Rico in their Alliance – which represent more than 36% of country's population – had pledged to reduce their economy-wide emissions by 26-28% below 2005 levels by 2025.[141] Also in 2017, the nine States comprising the Regional Greenhouse Gas Initiative (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont) proposed to build on the progress they have made over the past decade and reduce carbon emissions from the power sector an additional 30% by 2030 relative to 2020 levels.[142]

Many individual States have also made strong commitments to reduce greenhouse gases. For example, Colorado Governor John Hickenlooper signed an executive order committing his State to reduce its economy-wide greenhouse gas emissions by 26% below 2005 levels by 2025.[143] As part of that commitment, the State will also reduce its power sector emissions by 25% below 2012 levels by 2025, and by 35% below 2012 levels by 2030. These reduction goals are stronger than what would have been required by the CPP.[144] In issuing this policy, Governor Hickenlooper stated that "[c]lean energy is an economic engine for our state and for our nation."

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[137] NextEra, *NextEra Energy Partners' (NEE) CEO James Robo on Q1 2017 Results – Earnings Call Transcript*, Seeking Alpha, (Apr. 21, 2017), https://seekingalpha.com/article/4064238-nextera-energy-partners-nee-ceo-james-robo-q1-2017-results-earnings-call-transcript?part=single.

[138] Energywire, *Clean Power Plan: For many utilities, court action 'doesn't really change anything'* (Feb. 11, 2016), https://www.eenews.net/stories/1060032232.

[139] *Id.*

[140] NPR, *Texas Power Players Sit Out Political Opposition To Clean Power Plan* (Apr. 16, 2016), https://www.npr.org/2016/04/16/474462519/texas-power-players-sit-out-political-opposition-to-clean-power-plan.

[141] U.S. Climate Alliance, *2017 Annual Report: Alliance States Take the Lead* (2017) (The fourteen States are California, Colorado, Connecticut, Delaware, Hawaii, Massachusetts, Minnesota, New York, North Carolina, Oregon, Rhode Island, Vermont, Virginia, and Washington.), https://static1.squarespace.com/static/5936b0bde4fcb5371d7ebe4c/t/59bc4959bebafb2c44067922/1505511771219/USCA_Climate_Report-V2A-Online-RGB.PDF.

[142] RGGI Inc., *RGGI States Announce Proposed Program Changes: Additional 30% Emissions Cap Decline by 2030*, (Aug. 23, 2017), https://www.rggi.org/docs/ProgramReview/2017/08-23-17/Announcement_Proposed_Program_Changes.pdf.

[143] State of Colorado, Office of the Governor, *D 2017-015 Executive Order Supporting Colorado's Clean Energy Transition*, (July 11, 2017) https://www.colorado.gov/governor/sites/default/files/executive_orders/climate_eo.pdf.

[144] *Id.*

Similarly, Illinois enacted legislation in December 2016 that will reduce its greenhouse gas emissions, in part by mandating 4,300 MW of new wind and solar generation.[145] And Virginia is proposing to establish a program that will reduce carbon emissions from the power sector by 30% between 2020 and 2030.[146] City officials across the U.S. are also pledging to reduce emissions and accelerate clean energy deployment. At least 384 U.S. mayors have committed to "intensify efforts to meet each of our cities' current climate goals, push for new action to meet the 1.5 degrees Celsius target, and work together to create a 21st century clean energy economy."[147]

### F. Emission Reductions Greater Than Those in the CPP Can Be Implemented While Maintaining Reliability.

Although the Administrator's proposed repeal questions the impact of the CPP on electric system reliability, the evidence indicates that the implementation of the CPP would pose no threat to reliability – and, in fact, much more ambitious limits on carbon pollution could be smoothly integrated into the reliable planning and operation of the grid.

The changes anticipated from the CPP – shifts from higher-emitting generation to lower- and zero-emitting generation – have been ongoing for years without posing a problem to the reliability of the electricity system.[148] Indeed, the electric system incorporates various features that ensure reliability, including extensive planning, monitoring, and assessment requirements, mandatory reliability standards, and numerous remedies to address local or regional issues.[149] This extremely successful institutional framework would continue to ensure the reliability of the grid as States and power companies achieve the carbon pollution limits in the CPP.

In addition to the already-existing robust mechanisms for assuring reliability, EPA meticulously designed the CPP to ensure reliable electric generation, providing layers of protection and built-in redundancy to ensure against any possible compromises to the grid. First, EPA engaged in extensive consultation with agencies responsible for maintaining reliability, including the Federal Energy Regulatory Commission and DOE.[150] This engagement included four technical conferences and a commitment to continue coordinated efforts throughout the

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[145] Andrew Barbeau, EDF Blogs, *Illinois' Future Energy Jobs Bill Shows States are Taking the Lead to Build the Clean Energy Economy*, (Dec. 7, 2016), http://blogs.edf.org/energyexchange/2016/12/07/illinois-future-energy-jobs-bill-shows-states-are-taking-the-lead-to-build-the-clean-energy-economy/.

[146] Virginia State Air Pollution Control Board, *Tentative Agenda and Minibook: State Air Pollution Control Board Meeting*, (Nov. 16, 2017), http://www.townhall.virginia.gov/L/GetFile.cfm?File=C:%5CTownHall%5Cdocroot%5CMeeting%5C1%5C26694%5CAgenda_DEQ_26694_v1.pdf.

[147] Climate Mayors, *384 US Climate Mayors Commit to Adopt, Honor and Uphold Paris Climate Agreement Goals*, (June 1, 2017), https://medium.com/@ClimateMayors/climate-mayors-commit-to-adopt-honor-and-uphold-paris-climate-agreement-goals-ba566e260097.

[148] CPP Final Rule at 64,874.

[149] Craig Aubuchon, *et al*., Analysis Group, *Electric System Reliability and EPA's Clean Power Plan: Tools and Practices*, Doc. No.EPA-HQ-OAR-2013-0602-37015 at ES-1 (2015) ("[T]he standard reliability practices that industry and its regulators have used for decades are a strong foundation from which any reliability concerns about the Clean Power Plan will be addressed.").

[150] 80 Fed. Reg. at 64,671.

CPP's implementation.[151] Second, the compliance period does not commence until seven years after finalization of the rule and provides power plants with a long and forgiving averaging period within which to achieve the required emission reductions.[152] Third, the CPP allows a State to prescribe differing standards of performance on a plant-by-plant basis provided that the State's plan ensures that the fleet as a whole will satisfy the CPP's emission reduction targets. As such, the CPP allows for accommodation based on each State's unique circumstances.[153] States also have the flexibility to formulate compliance plans that suit their needs, including rate-based, mass-based, multi-state, and trading formats.[154] Fourth, States are required to demonstrate that their compliance plan considered reliability issues before EPA grants its approval.[155] Fifth, States have the option to propose amendments to approved plans in the event of unanticipated and significant reliability challenges.[156] Finally, the rule provides a reliability safety valve for individual sources that take effect if the plant's requirements under the State plan are inconsistent with maintaining reliability.[157]

During the rulemaking process, EPA modeled various illustrative plan approaches and found that under each scenario, "implementation of [the CPP] can be achieved without undermining resource adequacy or reliability."[158] The Agency reiterated this finding in its 2017 reconsideration denial when it concluded that "no approach to meet the final requirements need interfere with the ability of [the] sector to meet electricity demand."[159]

Recent reports also affirm the continued reliability of the bulk power system. The DOE Staff Report on Electricity Markets and Reliability – released on August 23, 2017 in response to Secretary of Energy Rick Perry's order to assess electricity markets and reliability in the face of the dynamic changes occurring within the U.S. power sector – concluded that electric reliability remains strong.[160] This conclusion is consistent with voluminous literature and evidence that shows there are no signs of deteriorating reliability on the grid today, and that continued growth in cleaner resources is fully compatible with sustained reliability. The North American Electric Reliability Corporation's ("NERC's") 2017 State of Reliability report found that over the past five years the trends in planning reserve margins were stable while other reliability metrics were either improving, stable, or inconclusive.[161] NERC also found that bulk power system resiliency

[151] *Id*. at 64,671, 64,874.
[152] *Id*. at 64,671.
[153] *Id*.
[154] *Id*.
[155] *Id*.
[156] *Id*.
[157] *Id*.
[158] EPA, Technical Support Document: Resource Adequacy and Reliability Analysis, Doc. No. EPA-HQ-OAR-2013-0602-36847, at 2 (Aug. 2015).
[159] CPP Reconsideration Denial: Appendix 2, at 129 (citing Sarah K. Adair, *et al*., Nicholas Institute for Environmental Policy Solutions, Duke University, *The Clean Power and Electricity Demand: Considering Load Growth in a Carbon-Constrained Economy* (Jan. 2016)).
[160] DOE, *Staff Report to the Secretary on Electricity Markets and Reliability* (Aug. 2017), https://energy.gov/sites/prod/files/2017/08/f36/Staff%20Report%20on%20Electricity%20Markets%20and%20Reliability_0.pdf.
[161] North American Electric Reliability Corporation, *State of Reliability 2017* (June 2017), http://www.nerc.com/pa/RAPA/PA/Performance%20Analysis%20DL/SOR_2017_MASTER_20170613.pdf.

to severe weather has continued to improve.[162] PJM, which has recently experienced both significant coal retirements and new deployment of clean energy resources, found that "the expected near-term resource portfolio is among the highest-performing portfolios and is well equipped to provide the generator reliability attributes."[163]

A wide range of literature further indicates that high renewable penetration scenarios are possible without compromising grid reliability, indicating that it is eminently feasible to achieve deeper carbon pollution reductions than required by the CPP. According to the Brattle Group, grid operators have been developing mechanisms to encourage greater operational flexibility to better integrate renewables while maintaining cost-effective and reliable electric service.[164] Studies also show that cleaner resources and new technologies being added to the system have, in combination, most if not all the reliability attributes provided by retiring coal-fired generation and other resources exiting the system. In fact, the evolving resource mix that includes the retirement of aging coal-fired capacity and the addition of new lower- and zero-emitting capacity can increase system reliability from a number of perspectives. For instance, available data indicate that forced and planned outage rates for renewable and natural gas technologies can be less than half of those for coal.[165] Renewable resources also help hedge against fuel supply and price volatility, contributing to increased resilience. Indeed, clean energy resources have demonstrated their ability to support reliable electric service at times of severe stress on the grid. In the 2014 polar vortex, for example, frozen coal stockpiles led to coal generation outages, while wind and demand response resources were increasingly relied upon to help maintain reliability.[166] More recently in 2017, wind energy contributed critical power during Hurricane Harvey, while W.A. Parish, one of America's largest coal plants, was forced to shutter two of its units after its coal piles were flooded.[167]

Recent comments from a diverse array of stakeholders opposing the DOE Grid Resiliency Pricing Rule proposal issued on September 29, 2017 further bolster the record that the shift away from coal-fired generation towards cleaner resources does not adversely impact grid reliability.[168] Contrary to the body of evidence in its own Staff report on electricity markets and reliability, DOE's proposal had asked FERC to intervene in wholesale markets to keep coal and nuclear plants online, arguing that certain units with 90-day on-site fuel provide necessary

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[162] *Id.*

[163] PJM Interconnection, *PJM's Evolving Resource Mix and System Reliability* (Mar. 2017), http://www.pjm.com/~/media/library/reports-notices/special-reports/20170330-pjms-evolving-resource-mix-and-system-reliability.ashx.

[164] Chang *et al., supra* note 108.

[165] Hibbard *et al., supra* note 108.

[166] PJM Interconnection, *Analysis of Operational Events and Market Impacts During the January 2014 Cold Weather Events* (May 2014), http://www.pjm.com/~/media/library/reports-notices/weather-related/20140509-analysis-of-operational-events-and-market-impacts-during-the-jan-2014-cold-weather-events.ashx.

[167] Benjamin Storrow, *Flooded Texas Coal Piles Dampen Reliability Arguments*, ClimateWire, Sept. 29, 2017, https://www.eenews.net/climatewire/2017/09/29/stories/1060062093.

[168] *See, e.g.*, Comments of MISO Transmission Owners, RM-18 (Oct. 23, 2017); Comments of ISO New England, Inc., RM18-1 (Oct. 23, 2017); Comments of Bipartisan Former FERC Commissioners, RM18-1 (Oct. 19, 2017); Multistate Comments of Attorneys General, State Agencies and State Consumer Advocates, RM18-1 (Oct. 23, 2017); Comments of Advanced Energy Management Alliance, RM18-1 (Oct 23, 2017); Comments of Public Interest Organizations, RM18-1 (Oct. 23, 2017).

reliability and resiliency services.[169] Commenters have noted that, given technological advancements, new variable renewable generation is capable of providing essential reliability services including voltage support, fast frequency response, and dynamic reactive power. In fact, in some cases, the bulk power system recovery performance is faster with high levels of variable renewable generation and low levels of thermal plant generation as compared to today's system.[170]

As part of this record, the Rhodium Group performed a detailed examination of outages which demonstrated that on-site fuel supply is not correlated with reliability. According to Rhodium Group, only 0.00007% of disturbances over the past five years were due to fuel supply problems and 0.00858% were due to generation inadequacy.[171] Rhodium Group found no evidence of any relationship between the generation share of coal and nuclear and the frequency or duration of outages experienced.[172] Conversely, Rhodium Group found that there was no relationship between the share of variable renewable generation and the frequency or duration of outages; in other words, there is no evidence to support the claim that renewables growth is eroding overall system reliability.[173] In fact, Rhodium Group notes that power companies in balancing authorities[174] with the highest share of renewable energy generation experienced the fewest outages in terms of both frequency and duration.[175]

And on January 8, 2018, FERC rejected the DOE proposal, affirming the continued reliability of the bulk power system.[176] According to FERC, "the extensive comments submitted by the RTOs/ISOs do not point to any past or planned generator retirements that may be a threat to grid resilience."[177]

This voluminous literature and evidence, as well as the many layers of reliability protection included in the CPP, conclusively support the Agency's original conclusions that the CPP poses no risk to grid reliability. Furthermore, the evidence described above indicates that deeper and faster emission reductions than those required by the CPP could be readily achieved without significant reliability impacts.

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[169] DOE, *Grid Resiliency Pricing Rule*, 82 Fed. Reg. 46,940 (Oct. 10, 2017).
[170] *See, e.g.*, Reply Comments of Michael Milligan, RM18-1 (Nov. 7, 2017).
[171] Houser *et al.*, Rhodium Group, *The Real Electricity Reliability Crisis*, (Oct. 3, 2017), http://rhg.com/notes/the-real-electricity-reliability-crisis.
[172] Larsen *et al.*, Rhodium Group, *Electric System Reliability: No Clear Link to Coal and Nuclear* (Oct. 23, 2017), Attachment X, http://rhg.com/notes/doe-nopr-ferc-comments.
[173] *Id.*
[174] A balancing authority is the responsible entity that integrates resource plans ahead of time, maintains load-interchange-generation balance within a balancing authority area, and supports interconnection frequency in real time. A balancing authority area is the collection of generation, transmission, and loads within the metered boundaries of the balancing authority. *See* North American Electric Reliability Corporation, *Glossary of Terms Used in NERC Reliability Standards* (Sep. 2014), https://library.e.abb.com/public/f091b8ae9dec300f85257d6500660234/pa_Stand_Glossary-2.pdf.
[175] *Id.*
[176] Federal Energy Regulatory Commission, Order Terminating Rulemaking Proceeding, Initiating New Proceeding, and Establishing Additional Procedures (Jan. 8, 2018). The Order terminates the DOE proposal proceeding and initiates a new proceeding to develop a common understanding of resilience that would enable a more holistic examination of the resilience of the bulk power system including transmission and distribution system impacts.
[177] *Id.*

## G. Other Evidence Indicates That More Ambitious Targets Than the CPP Would Be Achievable and Cost-effective.

Since the CPP was finalized in 2015, the ongoing market shift towards a cleaner electricity resource mix has narrowed the gap between projected emissions with and without the CPP. To be clear, these projected emission reductions are based on current economic trends and market forces – and may not be achieved without the long-term regulatory signal established by the CPP. But these trends also mean that more ambitious targets than the CPP can be achieved cost-effectively.

In 2015, EIA had projected that reference case power sector carbon pollution in 2030 without the CPP in place would be 10% below 2005 levels.[178] Since then, the market trends discussed above have resulted in reference case emission projections declining over time. In its 2017 Annual Energy Outlook, EIA projected that reference case emissions without the CPP in place would be 22% below 2005 levels in 2030.[179] And in its most recent 2018 Annual Energy Outlook, EIA projected reference case carbon pollution emissions without the CPP would be 28% below 2005 levels in 2030[180] – much closer to EPA's CPP target of 32% below 2005 levels by 2030.

A closer look at the BSER underlying the carbon pollution limits in the CPP affirms that it is eminently feasible to achieve faster and deeper reductions in carbon pollution. One of the building blocks EPA used when establishing the final CPP targets based on the BSER involved shifting generation to renewable energy (Building Block 3). Given the significant recent cost declines and increased deployment of renewable energy, the potential for Building Block 3 is much higher than previously estimated. In fact, in its modeling of the CPP, EPA relied on cost projections developed by the National Renewable Energy Laboratory ("NREL"), as published in its Annual Technology Baseline. NREL updates these cost projections each year to reflect the most recent technological progress. NREL's latest 2017 Annual Technology Baseline shows significant declines in the 2030 projected levelized cost of wind and solar compared to 2015 Annual Technology Baseline projections. Based on NREL's updated projections, onshore wind costs are 26% lower and utility scale solar photovoltaics are 47% lower than 2015 projections.[181] According to EIA's most recent projections, even without the CPP, renewable energy generation is projected to reach 1,055 TWh in 2030[182] – just shy of the approximately 1,200 TWh in 2030

[178] Energy Information Administration, Annual Energy Outlook 2015 (Apr. 2015), https://www.eia.gov/outlooks/archive/aeo15/index.cfm.
[179] Energy Information Administration, Annual Energy Outlook 2017 (Jan. 2017), https://www.eia.gov/outlooks/archive/aeo17/.
[180] Energy Information Administration, Annual Energy Outlook 2018 (Feb. 2018), https://www.eia.gov/outlooks/aeo/index.php.
[181] National Renewable Energy Laboratory, *Annual Technology Baseline*, https://atb.nrel.gov/electricity/data.html. Estimates are derived from mid-case projections in the 2017 version of the Annual Technology Baseline and an early draft of the 2015 version, which was what EPA relied on in its modeling. *See* EPA Base Casev.5.15 Using IPM Incremental Documentation, (Aug. 2015), https://www.epa.gov/sites/production/files/2015-08/documents/epa_base_case_v.5.15_incremental_documentation_august_2015.pdf.
[182] Energy Information Administration, *Annual Energy Outlook 2018* (Feb. 2018), https://www.eia.gov/outlooks/aeo/index.php.

total renewable energy used in Building Block 3 in the final CPP.[183] Indeed, EIA projects renewable energy would constitute 23% of the total generation in 2030[184] – higher than EPA's 2015 modeling projections of 21% renewable generation in 2030 under the CPP.[185] This further supports a stronger Building Block 3 and demonstrates that more ambitious targets than the CPP would be achievable and cost-effective.

Another building block EPA used when establishing the final CPP targets involved shifting generation from higher-emitting coal-fired sources to cleaner natural gas combined cycle units (Building Block 2). Since the CPP was finalized in 2015, natural gas prices have continued to decline, driving the ongoing shift towards higher natural gas utilization. Indeed, the average capacity factor of natural gas combined cycle plants reached 56% in 2016 while the average capacity factor of coal generators dropped to 53%.[186] By comparison, in 2008, natural gas combined cycle plants operated at an average capacity factor of 40% while the average capacity factor of coal generators was 73%.[187] In the PJM Interconnection, the shift towards natural gas has been even more pronounced, with natural gas combined cycle facilities operating at an average capacity factor of 62% in 2016 while coal units operated at a 33% average capacity factor.[188] Natural gas combined cycle capacity has also significantly increased since EPA finalized the CPP. In 2016, natural gas combined cycle in-service capacity reached roughly 240 GW,[189] compared to roughly 210 GW of existing capacity in 2012 used in Building Block 2 in the final CPP.[190] This means that even more natural gas generation is available to displace coal. Further, based on EIA's latest projections, the 2030 power sector delivered natural gas price without the CPP is projected to be $4.78/mcf ($2017) – roughly 30% lower than previously projected in 2015.[191] This all further supports a stronger Building Block 2 and indicates that more ambitious targets than the CPP would be achievable and cost-effective.

In its 2017 Reconsideration Denial, EPA also identified a range of measures – additional to those included in the CPP BSER – that can be used to meet emission reduction targets under the CPP based on technology advances and project updates since finalization of the CPP.[192]

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[183] *See* EPA Greenhouse Gas Mitigation Measures Technical Support Document (Aug. 2015), Attachment N. The 1,200 TWh renewable energy in 2030 number is derived using the incremental (above 2012) Building Block 3 generation potential of 706 TWh in 2030 plus renewable energy generation of 495 TWh in 2012.
[184] Energy Information Administration, *Annual Energy Outlook 2018* (Feb. 2018), https://www.eia.gov/outlooks/aeo/index.php.
[185] CPP RIA.
[186] M.J. Bradley & Associates, *Coal-Fired Electricity Generation in the United States and Future Outlook* (Aug. 2017), Attachment Q.
[187] *Id.*
[188] *Id.*
[189] See Energy Information Administration, *Electric Power Monthly* (Mar. 2017), Table 6.1, https://www.eia.gov/electricity/monthly/archive/march2017.pdf.
[190] *See* Energy Information Administration, *Annual Energy Outlook 2015* (Apr. 2015), https://www.eia.gov/outlooks/archive/aeo15/index.cfm; *see also* $CO_2$ Emission Performance Rate and Goal Computation Technical Support Document for CPP Final Rule.
[191] See Energy Information Administration, *Annual Energy Outlook 2018* (Feb. 2018), https://www.eia.gov/outlooks/aeo/index.php; Energy Information Administration, *Annual Energy Outlook 2015* (Apr. 2015), https://www.eia.gov/outlooks/archive/aeo15/index.cfm. In 2015, the power sector delivered natural gas price without the Clean Power Plan was projected to be $6.38/mcf ($2013) or $6.70/mcf ($2017).
[192]EPA, Basis for Denial of Petitions to Reconsider and Petitions to Stay the Clean Power Plan, Appendix 3 – Non-BSER CPP Flexibilities (Jan. 2017), Attachment J [Hereinafter "CPP Reconsideration Denial: Appendix 3"].

These include switching from coal to gas or another fuel, carbon capture and storage, efficiency improvements at gas turbines and integrated renewables – which are discussed in more detail in Section VI below, in addition to non-BSER renewables such as offshore wind and distributed solar as well as demand-side energy efficiency. According to EPA, application of such non-BSER measures to the 2012 CPP baseline data for each State results in an emissions estimate that is lower than the 2030 CPP goal for nearly every State.[193]

Applying EIA's 2014 Annual Energy Outlook carbon price side cases to the updated 2018 Annual Energy Outlook reference case without the CPP further illustrates the significant potential for much more ambitious targets than the CPP. Using the $10 per metric ton carbon price yields a 19% abatement beyond business-as-usual in 2030, which when applied to the 2018 Annual Energy Outlook reference case results in a 42% carbon pollution emission reduction below 2005 levels in 2030.[194] Using the $25 per metric ton carbon price yields a 63% abatement beyond business-as-usual in 2030 – this translates into a 73% emission reduction below 2005 levels in 2030, significantly more ambitious than EPA's 2030 emission reduction targets of 32% below 2005 under the CPP.[195] A 2015 study which looked at different scenarios for U.S. power plant carbon standards, using energy demand projections in the 2013 Annual Energy Outlook as the benchmark, also found that a $43 per ton carbon price in 2020 would yield 39.8% abatement beyond business-as-usual in 2020 or 49.2% below 2005 levels in 2020.[196] As discussed above, given the recent declines in renewable energy costs and decrease in natural gas prices, reductions in emissions are feasible at significantly less cost than previously projected. Since the costs of shifting to lower-emitting resources has fallen over the past few years, the power sector's responsiveness to a carbon price may be even stronger than these previous analyses indicate.

Recent modeling performed as part of the United States Mid-Century Strategy for Deep Decarbonization also illustrates the significant potential for clean energy deployment and decarbonization of the U.S. electricity sector.[197] This modeling shows that an effective carbon price that starts at $20 per metric ton in 2017 and increases at 5% per year, combined with successful innovation policies, would be sufficient to put energy carbon pollution emissions on a pathway consistent with the mid-century strategy vision, in the range of 80% below 2005 levels by 2050.[198] This would entail near-complete decarbonization of the electricity sector with wind and solar capacity additions of roughly 30 GW per year between 2016 and 2035[199] – significantly higher than the wind and solar maximum annual capacity growth factor of 17.8 GW used in Building Block 3 in the final CPP.[200]

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[193] *Id.* at 17.

[194] *See* Energy Information Administration, *Annual Energy Outlook 2018* (Feb. 2018), https://www.eia.gov/outlooks/aeo/index.php; Energy Information Administration, *Annual Energy Outlook 2014* (May 2014), https://www.eia.gov/outlooks/archive/aeo14/index.cfm. The $10 per metric ton carbon price side case starts at $10 and rises by 5% per year.

[195] *See id.* The $25 per metric ton carbon price side case starts at $25 and rises by 5% per year.

[196] Charles T. Driscoll, Jonathan J. Buonocore, Jonathan I. Levy, Kathleen F. Lambert, Dallas Burtraw, Stephen B. Reid, Habibollah Fakhraei and Joel Schwartz, US Power Plant Carbon Standards and Clean Air and Health Co-benefits (May 2015), Attachment T.

[197] The White House, United States Mid-Century Strategy for Deep Decarbonization (Nov. 2016).

[198] *Id.*

[199] *Id.*

[200] *See* $CO_2$ Emission Performance Rate and Goal Computation Technical Support Document for CPP Final Rule.

Together, the evidence described above indicates that more ambitious targets than the CPP would be achievable and cost-effective.

## IV. THE CLEAN AIR ACT REQUIRES EPA TO ESTABLISH EMISSION GUIDELINES THAT ACHIEVE MAXIMUM FEASIBLE CONTROL OF HARMFUL POLLUTION.[201]

As noted elsewhere in these comments, the ANPR strongly suggests that EPA – if it proposes a replacement for the CPP at all – intends to promulgate emission guidelines that are based on ineffective systems of emission reduction that would achieve little or no reduction in carbon pollution from existing power plants. Such an approach would be patently arbitrary and capricious, in part because it would reflect a total disregard for the urgency of mitigating the massive quantities of carbon pollution discharged by existing power plants, and the voluminous evidence indicating that the emission guidelines in the CPP are eminently achievable and at extremely modest cost (see section III). As discussed here, however, such an approach would also flout the core purposes of section 111 – to establish rigorous standards that achieve "maximum feasible control" of harmful pollution and give significant weight to the quantity of emission reductions achieved.

Section 111 is one of the foundational pillars of the CAA, whose primary purpose 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."[202] Under section 111, EPA must ensure that new sources (and, where appropriate, existing sources) are subject to a "standard of performance" that "reflects the degree of emission limitation achievable through the application of the *best* system of emission reduction which . . . the Administrator determines has been adequately demonstrated," taking into account costs, energy requirements, and nonair quality health and environmental impacts.[203]

In interpreting this basic requirement, the courts have recognized that EPA has substantial discretion in weighing the statutory factors that inform the selection of the "best system."[204] But the courts have also underscored that the statute's reference to the "best" system necessarily *requires* EPA to give weight to the amount of emission reduction achieved in establishing standards of performance. As the D.C. Circuit held in reviewing EPA's 1979 NSPS for fossil fuel fired steam generating units, there is "no sensible interpretation of the statutory words 'best . . . system' which would not incorporate the amount of air pollution as a relevant factor to be weighed when determining the optimal standard for controlling . . . emissions.''[205] EPA recognized in the CPP itself that "[t]he fact that the purpose of a 'system of emission reduction' is to reduce emissions, and that the term itself explicitly incorporates the concept of reducing emissions, supports the . . . view that in determining whether a 'system of emission

[201] This section responds to questions 2 and 3(a) from the ANPR. *See* 82 Fed. Reg. at 61,511.
[202] 42 U.S.C. § 7401.
[203] 42 U.S.C. § 7411(a)(1) (emphasis added).
[204] *See Lignite Energy Council v. EPA*, 198 F.3d 930, 933 (D.C. Cir. 1999) (citing *New York v. Reilly*, 969 F.2d 1147, 1150 (D.C. Cir. 1992)).
[205] *See Sierra Club v. Costle*, 657 F.2d 298, 326 (D.C. Cir. 1981).

reduction' is the 'best,' EPA must consider the amount of emission reductions that the system would yield."[206]

That Congress intended for section 111 standards to achieve meaningful reductions in emissions is not only evident in the statutory text; the courts have recognized that it is also clear from the legislative history. As the D.C. Circuit recognized in *Essex Chemical Corporation v. Ruckelshaus,* citing to the legislative history of the 1970 CAA Amendments, "Congress was most concerned [in section 111] that new plants – new sources of pollution – would have to be controlled to the *greatest degree practicable* if the national goal of a cleaner environment was to be achieved."[207] The legislative history for the 1977 CAA Amendments similarly reflects an explicit intention that section 111 standards "require achievement of the *maximum degree of emission reduction* from new sources."[208] And in *Sierra Club v. Costle,* the D.C. Circuit recognized that the "essential purposes" of the CAA included that "[section 111] standards must reduc[e] emissions as much as practicable."[209]

Although *Sierra Club* and *Essex Chemical Corporation* involved review of standards of performance for new sources, there is no reason to believe that the underlying Congressional purposes are different for existing sources. In the 1990 CAA Amendments, Congress provided that the *same* definition of "standard of performance" – incorporating the concept of a "best system of emission reduction" – applies to both new and existing sources. And as EPA recognized in 1975, when it first promulgated regulations implementing section 111(d) for existing sources, section 111 "requires *maximum feasible control of pollutants from new stationary sources* . . . . [Section 111(d)] reflected a decision in conference that a *similar approach* (making allowance for the costs of controlling existing sources) was appropriate for the pollutants to be controlled under section 111(d)."[210] Statutory text, legislative history, administrative precedent, and the overall purpose of section 111 therefore make unmistakably clear that in crafting emission guidelines for carbon pollution from existing power plants, EPA's goal must be to seek maximum feasible control of these harmful emissions.

An emission guideline for carbon pollution from existing power plants that fails to achieve meaningful emission reductions would not only be inconsistent with this overriding purpose of maximum feasible control, it would also violate a closely-related purpose of section 111, which is to "assure the use of available technology and to stimulate the development of new

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[206] CPP Final Rule at 64,721.

[207] *Essex Chem. Corp. v. Ruckelshaus*, 486 F.2d 427, 434 n.14 (D.C. Cir. 1973) (citing S. Rep. No. 1196, 91st Cong., 2d Sess. 16 (1970); Summary of the Provisions of Conference Agreement on the Clean Air Act Amendments of 1970, 116 CONG. REC. 42384, 42385 (1970)) (emphasis added).

[208] *See* H.R. Rep. No. 95-294, at 189.

[209] *Sierra Club v. Costle*, 657 F.2d 298, 325-326 (D.C. Cir. 1981). *See also Pacific Power Co. v. EPA*, 647 F.2d 60, 68 (9th Cir. 1981) (holding that Congress intended that new source emissions controlled under section 111 would be reduced "to a minimum").

[210] State Plans for the Control of Certain Pollutants From Existing Facilities, 40 Fed. Reg. 53,340, 53,342 (Nov. 17, 1975) (emphasis added); *see also id.* at 53,344 (stating that "section 111(d) requires *maximum feasible control* of welfare-related pollutants in the absence of" a reasoned basis for a less stringent approach, and that "EPA will promulgate plans requiring maximum feasible control if States fail to submit satisfactory plans for welfare-related pollutants.") (emphasis added).

technology."[211] Courts have long recognized that EPA can and must encourage new and less-polluting technologies by establishing rigorous standards under section 111. As the D.C. Circuit held in *Sierra Club v. Costle*, "[t]he statutory factors which EPA must weigh [when setting performance standards] are broadly defined and include within their ambit subfactors such as technological innovation."[212] In *Portland Cement Association v. Ruckelshaus*, the court likewise recognized that section 111 standards are forward-looking in nature, and can and should be based on reasonable projections of systems that can be expected to be available in the future.[213] These decisions rest, among other things, on ample legislative history indicating Congress' intent that section 111 standards drive the development and diffusion of innovative methods for reducing emissions.[214]

Moreover, the D.C. Circuit has explained that the technology-forcing purpose of section 111 should not only inform the selection of a "best system," it should also drive the determination of what standards are "achievable" using that system:

> Recognizing that the Clean Air Act is a technology-forcing statute, we believe EPA does have authority to hold the industry to a standard of improved design and operational advances, so long as there is substantial evidence that such improvements are feasible and will produce the improved performance necessary to meet the standard…. As a result, we uphold EPA's judgment that the standard can be set at a level that is higher than has been actually demonstrated over the long term by currently operating lime scrubbers at plants burning high sulfur coal.[215]

The court further recognized in *Sierra Club* that the undisputed legislative purposes of section 111 include that "standards should be stringent in order to force the development of improved technology."[216] As the *Sierra Club* decision suggests, EPA has appropriately crafted section 111 standards for the power sector in a manner that fulfills this technology-forcing purpose. The Congressional Research Service ("CRS"), in documenting the technology-forcing function that section 111 has historically played, has noted that EPA based its 1971 and 1979 NSPS for coal-fired electric generating units on flue gas desulfurization ("FGD") technology that was relatively cutting-edge and little-used at the time the standards were adopted. CRS observed

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[211] S. Rep. No. 95-127 at 171; *see also* H.R. Rep. No. 95-294, at189 ("[I]t is prudent public policy to require achievement of the maximum degree of emission reduction from new sources, while encouraging the development of *innovative technological means of achieving equal or better degrees of control*.").

[212] *Sierra Club*, 657 F.2d 298, 346 (D.C. Cir. 1981). *See also Portland Cement Ass'n v. EPA* (*"Portland Cement III"*), 665 F.3d 177, 190 (D.C. Cir. 2011) (EPA properly based the NSPS for new cement kilns on a recent and more efficient model, even though many older kilns still existed that did not utilize the same technology.).

[213] *Portland Cement Ass'n v. Ruckelshaus*, 486 F.2d 375, 391 (D.C. Cir. 1973) ("Section 111 looks toward what may fairly be projected for the regulated future, rather than the state of the art at present"); *id.* ("The Administrator may make a projection based on existing technology, though that projection is subject to the restraints of reasonableness and cannot be based on 'crystal ball' inquiry.").

[214] *See* S. Rep. No. 91-1196, at 16 (1970) (new source performance standards should reflect "the degree of emission control that has been or can be achieved through the application [of] technology which is available or normally can be made available. *This does not mean that the technology must be in actual, routine use somewhere*.") (emphasis added); *id.* at 17 ("Standards of performance *should provide an incentive for industries to work toward constant improvement in techniques* for preventing and controlling emissions from stationary sources.").

[215] *Sierra Club*, 657 F.2d at 364 (footnote omitted).

[216] *Sierra Club*, 657 F.2d at 325.

that EPA's authority to determine which technologies have been adequately demonstrated "has been used to authorize control regimes that extended beyond the merely commercially available . . . and thus are considered by many to have been 'technology-forcing.'"[217]

These overarching statutory purposes must inform EPA's selection of the "best system of emission reduction" for carbon pollution from existing power plants. Regardless of whether EPA ultimately interprets that term to embrace the specific BSER identified in the CPP, it has a legal obligation under section 111 to conduct a searching examination of all options available for reducing carbon pollution from existing power plants – and to select a "best system" and emission guideline that achieves maximum feasible control of these dangerous emissions. Given the abundant evidence that the emission reduction targets in the CPP are eminently achievable and at extremely low cost, it would clearly violate that obligation for EPA to opt for a BSER that achieves fewer or no emission reductions.

## V. THE PROPOSED REPEAL'S CONCLUSION THAT THE CAA SHOULD BE INTERPRETED TO PRECLUDE THE CPP IS UNLAWFUL AND ARBITRARY, AND CANNOT BE ASSUMED IN ANY PROPOSED REPLACEMENT RULE.[218]

The ANPR improperly relies on the proposed repeal's flawed conclusion that the CAA precludes the CPP BSER. The CPP's BSER rested upon a thorough analysis of legal requirements and was amply supported by record evidence. By contrast, the proposed repeal's conclusion that the CPP exceeds EPA's statutory authority is nonfinal, feebly supported, and legally flawed. By directly incorporating and relying upon the legal rationales in the proposed repeal, the ANPR inherits those flaws, resulting in an unlawful and arbitrary approach. The ANPR's express, repeated pronouncements that EPA is soliciting only comments that conform to the legal basis for the proposed repeal unreasonably presumes the outcome of that rulemaking and places an unjustified constraint on information received and considered by the Agency.

### A. The CPP BSER Is Lawful, and EPA's Proposed Interpretation – to the Extent it Precludes the CPP BSER – is Arbitrary and Unreasonable.

A central flaw in the proposed repeal is that EPA has misapprehended the CPP BSER and arbitrarily determined that its purportedly "new" interpretation of section 111 requires repeal of the CPP. As the ANPR states, EPA's proposed repeal concludes that the BSER must be limited to "measures that can be *applied to or at* a stationary source, at the source-specific level." Yet the CPP, properly viewed, consists precisely of such measures – insofar as it contemplates that high-emitting power plants will reduce their utilization in an amount that can be feasibly and cost-effectively taken up by cleaner sources. Moreover, the CPP provides for (and in fact,

[217] Larry Parker & James E. McCarthy, Cong. Res. Serv., R40585, Climate Change: Potential Regulation of Stationary Greenhouse Gas Sources Under the Clean Air Act 12 (2009). *See also* Final Brief of *Amici Curiae* Technological Innovation Experts Nicholas Ashford, M. Granger Morgan, Edward Rubin, and Margaret Taylor in Support of Respondents, *North Dakota v. EPA*, No. 15-1381, 23-31 (filed Feb. 6, 2017).

[218] This section responds to questions 2 and 5 from the ANPR. *See* 82 Fed. Reg. at 61,511.

requires) "source-specific" standards that can be met by individual power plants either through actions taken on-site to reduce emissions from that same plant (e.g., improved operating efficiency, co-firing, CCS, reduced utilization) or by purchasing credits or allowances that represent comparable measures undertaken elsewhere on the grid.

To the extent EPA concludes that its interpretation precludes the CPP BSER, however, that interpretation is clearly arbitrary and unreasonable. The rulemaking docket for the CPP contains robust support for the lawfulness of its BSER interpretation.[219] The CPP BSER is consistent with the text of section 111(a),[220] legislative history,[221] administrative precedent,[222] and statutory factors,[223] and is supported by the unique characteristics of the source category and pollutant that the rule addresses.[224]

*1. EPA's textual argument for reinterpreting the CAA to preclude the CPP fails.*

As EPA explained in the CPP, "'system' is not defined in the [CAA]," but using its "ordinary meaning," the phrase "'system of emission reduction' takes a broad meaning to serve a singular purpose: It is a set of measures that work together to reduce emissions."[225] Although Congress did not define the term "best system of emission reduction," EPA recognized that "its plain meaning is deliberately broad and is capacious enough to include" the CPP BSER. In the proposed repeal and ANPR, EPA has not offered any textual basis for limiting the definition of "system" or "system of emission reduction."

Instead, EPA's textual rationale for narrowing EPA's interpretation is that the standard of performance must be "for" a source, and the BSER must be achievable through the "application" of the BSER.[226] However, neither of these statutory terms in any way precludes the BSER adopted in the CPP. First, the requirement that a standard of performance be "for" a source refers to standards contained in implementation plans, and says nothing about what EPA can consider in the BSER that underlies those standards of performance. Moreover, nothing about the BSER adopted in the CPP prevents States from adopting standards of performance "for" any existing source; indeed, the uniform performance rates promulgated in the CPP were *designed* to be applied to individual power plants and could be directly adopted by States or by EPA as "standards of performance" in State and federal plans.

Contrary to EPA's claim that "application" "signals a physical or operational change to a source,"[227] the word itself implies no limitation based on physical attachment. The very CAA sections that EPA cites in support of its new interpretation in fact demonstrate that the statute uses *application* in reference to a broad range of measures including processes, methods,

[219] *See generally* CPP Final Rule at 64,758-87.
[220] *See id.* at 64,761-63.
[221] *See id.* at 64,763-66.
[222] *See* CPP Legal Memorandum at 95-116.
[223] *See* CPP Final Rule at 64,772-73.
[224] *Id.* at 64,769.
[225] *Id.* at 64,762.
[226] 82 Fed. Reg. at 48,039.
[227] *Id.*at 48,039-40.

systems, techniques, technology, and controls.[228] Furthermore, these sections contain no language implying that the measures must be limited to equipment that can be physically bolted on to each affected source. To the extent that these sections reference controls implemented on-site at each source, such language is noticeably absent from section 111.

*2. The CPP BSER accords with the legislative history of section 111.*

The CPP BSER fully accords with the legislative history of section 111, which reveals Congress's intent that EPA consider a broad range of emission reduction measures when determining the BSER. For example, the report accompanying the Senate's bill for the 1970 CAA Amendments provided that "standards of performance" should "reflect the greatest degree of emission control which the Secretary determines to be achievable through application of the *latest available control technology, processes, operating methods, or other alternatives*."[229] The Senate plainly contemplated a more expansive inquiry than EPA would allow in its proposed repeal. The Conference bill adopted the current formulation that the standard of performance must "reflect[] the degree of emission limitation achievable through the application of the best system of emission reduction." In agreeing to the Conference language, the Senate stated, "The [Conference] agreement authorizes regulations to require new major industry plants . . . [to] achieve a standard of emission performance based on the latest available control technology, processes, operating methods, and other alternatives," reflecting the same capacious language the Senate originally used to describe a "standard of performance."[230] This broad inquiry, well beyond mere add-on technology, would be accomplished by the federal government looking to the "best system of emission reduction" as the basis for the section 111 standards.

Subsequent legislative developments reinforce EPA's directive to conduct a broad inquiry into the BSER. In 1977, Congress mandated that a system of emission reduction for existing sources be "continuous."[231] In 1990, however, Congress removed that limitation,[232] again indicating that EPA's inquiry into the best system is appropriately broad. (In contrast to the requirements for new sources, the best system for existing sources *never* had to be "technological.")

*3. The CPP BSER is supported by substantial administrative precedent.*

In the CPP, EPA interpreted the BSER to include measures that EPA has long used as the basis for standards to limit air pollution – and that Administrator Pruitt now proposes to restrict. Under section 110(a)(2)(D) of the CAA, for example, EPA has adopted a series of rulemakings that limit interstate transport of $NO_x$ and $SO_2$ from the power sector by establishing state-wide emission budgets based on State or regional application of pollution control measures. In the

[228] *See id.* at 48,040 (citing 42 U.S.C. §§ 7412(d)(2), 7479(3), 7521(a)(3)(A)(i), 7521(a)(3)(D)). (EPA's citation to 7479(e) has been corrected to 7479(3)).
[229] S. 4358, 91st Cong. § 6(b) (1970) (emphasis added).
[230] 116 Cong. Rec. 42,384 (1970) (Senate Agreement to Conference Report on H.R. 17255). That same Senate statement also noted that the "conference agreement, as did the Senate bill, provides for national standards of performance on emission from new stationary sources," again confirming the analogy to the prior Senate version. *Id.* at 42,385.
[231] Clean Air Act Amendments of 1977, Pub. L. No. 95-95, § 109(c)(1)(A), 91 Stat. 685, 699-700.
[232] Clean Air Act Amendments of 1990, Pub. L. No. 101-549, § 403(a), 104 Stat. 2399, 2631.

case of the 1998 $NO_x$ SIP Call, these budgets were based on IPM modeling of a multi-state emissions trading system designed to achieve an average emission rate expressed in pounds per unit of heat input – taking into account changes in dispatch and other measures available to reduce aggregate $NO_x$ emissions from the power sector.[233] Similarly, EPA's 2011 Cross State Air Pollution Rule – upheld by the Supreme Court as a "permissible, workable, and equitable interpretation" of section 110[234] – established state-wide budgets for $NO_x$ and $SO_2$ that were based on power sector modeling of emission reductions achievable through "increased dispatch of lower-emitting generation" and fuel-switching, among other compliance options.[235] In both of these major power sector rulemakings, EPA established state-wide emission targets that reflected system-based measures to achieve aggregate emission reductions from the power sector, which is similar to the CPP BSER analysis of emission reductions available by shifting generation away from high-emitting power plants.

The explicit cross-reference to section 110 that appears in section 111(d) only underscores that the same types of standard-setting approaches that EPA has adopted for interstate air pollution are appropriate models for the CPP. The CAA provides that the procedure for establishing standards of performance for existing sources under section 111(d) is to be "similar" to that of section 110, and section 110 expressly provides that emission limitations and control measures can include "fees, marketable permits, and auctions of emissions rights." The direct link to section 110 thus further reinforces the appropriateness of such flexible approaches under section 111(d).

EPA has also applied averaging approaches extensively in setting emission standards for mobile sources and fuels. Under Title II of the CAA, EPA has long interpreted its authority to establish "emission standards" for motor vehicles to allow for average standards that apply to broad categories of vehicles and engines.[236] In promulgating its first particulate matter and $NO_x$ emission standards for heavy-duty vehicles in 1985, EPA defended the averaging concept as "fully consistent with the technology-forcing mandate of the Act" and essential to establishing rigorous standards for a diverse group of sources.[237] The D.C. Circuit specifically upheld EPA's use of averaging in those standards – noting the "absence of any clear evidence that Congress meant to prohibit averaging" and the reasonable policy arguments EPA advanced in favor of the approach.[238] Similarly, EPA's regulations phasing out lead in gasoline took the form of an

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[233] *See* Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transport of Ozone, 63 Fed. Reg. 57,356, 57,400-401 (Oct. 27, 1998) ("$NO_x$ SIP Call") (explaining approach to developing cost curves and state emission budgets).
[234] *EPA v. EPE Homer City Generation, L.P.*, 134 S. Ct. 1584, 1610 (2014).
[235] Federal Implementation Plans: Interstate Transport of Fine Particulate Matter and Ozone and Correction of SIP Approvals, 76 Fed Reg. 48,208, 48,252, 279-80 (Aug. 8, 2011).
[236] *See* Control of Air Pollution from New Motor Vehicles and New Motor Vehicle Engines; Gaseous Emission Regulations for 1987 and Later Model Year Light-Duty Vehicles, and for 1988 and Later Model Year Light-Duty Trucks and Heavy-Duty Engines; Particulate Emission Regulations for 1988 and Later Model Year Heavy-Duty Diesel Engines, 50 Fed. Reg. 10,606 (Mar. 15, 1985) (describing averaging system and noting that it is similar to the averaging system established for light-duty vehicles and trucks in 1983).
[237] *Id.*
[238] *See Nat. Resources Defense Council v. Thomas*, 805 F.2d 410, 425 (D.C. Cir. 1986) ("Lacking any clear congressional prohibition of averaging, the EPA's agreement that averaging will allow manufacturers more flexibility in cost allocation while ensuring that a manufacturer's overall fleet still meets the emissions reduction standards makes sense.").

average standard for the "total pool" of gasoline produced by each refiner; EPA's assumption that refiners would participate in a future inter-refinery credit trading system, which was integral to the stringency of the standard, was likewise upheld by the D.C. Circuit.[239] Thus, average standards such as those proposed in the CPP are a time-tested regulatory approach under the CAA and a reasonable application of the language of section 111. In the context of section 111 and greenhouse gas emissions, a flexible system that enables a wide variety of available solutions to achieve rigorous and cost-effective carbon pollution reductions manifestly fulfills the statutory criteria for the "best" system.

*4. The CPP BSER is consistent with the statutory factors of section 111(a)(1).*

Contrary to Administrator Pruitt's claim in the proposed repeal that the CPP "exceed[ed] the bounds of the statute," EPA also acknowledged and carefully accounted for the limitations that the statute imposes on the BSER. In particular, EPA identified four "[c]onstraints": (1) "the BSER must assure emission reductions from the affected sources," (2) "the BSER must be controls or measures that the [sources] themselves can implement," (3) the BSER must be "adequately demonstrated," and (4) the BSER must be the "'best,' 'taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements."[240]

EPA carefully explained how the CPP BSER satisfies each of these statutory factors. Factors (3) and (4) bear special emphasis because they rely on rigorous technical analysis that EPA performed for the CPP rulemaking, but that the Administrator essentially neglected in the proposed repeal and ANPR.

The D.C. Circuit has found that "[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."[241] Determining whether a system is "adequately demonstrated" necessarily entails examining how the affected sources operate, as well as the pollutant being addressed. In the CPP, EPA was guided by its understanding that "$CO_2$ is a global pollutant that is exceptionally well-suited to emission reduction efforts optimized on a broad geographic scale rather than on a unit-by-unit basis."[242] EPA also analyzed "[t]he physical properties of electricity and the highly integrated nature of the electricity system" and described the electricity sector's "well-established history of substituting one type of generation for

[239] *See Small Refiner Lead Phase-Down Task Force v. EPA*, 705 F.2d 506, 536 (D.C. Cir. 1983). Note that although section 211(g) of the Clean Air Act placed numerical limits on average lead standards for small refiners, that section made no mention of inter-refinery trading for purposes of standard-setting or compliance. *See* Clean Air Act Amendments of 1977, Pub. L. No. 95-95, § 223, 91 Stat. 685, 764 (1977). In addition, EPA's pre-1977 regulations for refiners established "total pool" average lead standards despite the absence of explicit authorization for such standards in the Act. *See* Clean Air Act Amendments of 1970, Pub. L. No. 91-604, § 211, 84 Stat. 1676, 1698 (1970). Those early standards were also upheld by the D.C. Circuit, *see Ethyl Corp. v. EPA*, 541 F.2d 1 (D.C. Cir. 1976), and Congress effectively ratified EPA's approach in 1977 by enacting a special provision for small refiners prescribing maximum levels of stringency for average lead limits.

[240] CPP Final Rule at 64,776-79.

[241] *Essex Chem. Corp. v. Ruckelshaus*, 486 F.2d 427, 433 (D.C. Cir. 1973).

[242] CPP Final Rule at 64,769.

another."[243] Based on its analysis, EPA lawfully and rationally incorporated generation-shifting – an "everyday" practice utilized by industry – into the CPP BSER.[244]

The Agency also thoroughly evaluated the costs of the rule along a variety of metrics.[245] EPA compared the costs of the CPP to the costs of other limits on air pollution from the power sector, the carbon price that power companies were assuming in their integrated resource plans, and "[i]n light of the severity of the observed and projected climate change effects on the U.S., U.S. interests, and U.S. citizens, combined with EGUs' large contribution to U.S. GHG emissions."[246] EPA analyzed costs on a source-by-source basis and for the industry as a whole,[247] finding, for example, that the CPP's compliance costs would "amount to a 4 percent increase in the cost of meeting electricity demand, while securing public health and welfare benefits that are several times greater."[248] EPA also assessed the CPP's impact on retail electricity rates and overall electricity bills.[249] Having conducted this thorough analysis, EPA deemed the costs reasonable.[250] EPA also calculated "that the monetized benefits of this rule are substantial and far outweigh the costs."[251] EPA specifically advised against a narrower, artificially constrained BSER interpretation such as that in the proposed repeal, noting that it "would permit consideration only of potential $CO_2$ reduction measures that are either more expensive . . . or measures capable of achieving far less reduction in $CO_2$ emissions."[252]

EPA extensively assessed the CPP's impact on energy requirements in the technical support document "Resource Adequacy and Reliability Analysis."[253] In that analysis, the Agency determined that "power system impacts of the final rule on system operations, under conditions preserving resource adequacy, are modest and manageable."[254] In particular, EPA noted the tremendous compliance flexibilities that the CPP affords to States and sources, the extended compliance timeframe, and the rule's reliability safety valve.[255]

In addition to the statutory factors informing the BSER discussed above, EPA explained why application of the BSER yielded an "achievable" emission limitation.[256] EPA carefully considered the D.C. Circuit case law on achievability in the comparable requirement for regulations under section 111(b).[257] For instance, "according to the Court, '[a]n achievable

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[243] *See, e.g., id.* at 64,777, 64,795-97, 64,803-04.
[244] *Id.* at 64,729.
[245] *See, e.g.,* CPP RIA, ch. 3 (Aug. 2015); CPP Final Rule at 64,749-51, 64,801-02, 64,810-11.
[246] CPP Final Rule at 64,750-51.
[247] *See id.*
[248] CPP RIA at 3-23.
[249] *See id.* at 3-35 to -40.
[250] *See* CPP Final Rule at 64,749-51.
[251] *Id.* at 64,682.
[252] *Id.* at 64,769.
[253] EPA, Technical Support Document: Resource Adequacy and Reliability Analysis, Docket ID No. EPA-HQ-OAR-2013-0602-36847 (Aug. 2015) [Hereinafter "Reliability TSD"]; *see also* 80 Fed. Reg. at 64,571 ("There is no reason to expect an adverse non-air environmental or energy impact from deployment of the combination of the three building blocks, whether considered on a source-by-source basis, on a sector-wide or national basis, or both.").
[254] Reliability TSD at 1.
[255] *See id.* at 1-2.
[256] 42 U.S.C. § 7411(a)(1).
[257] *See* CPP Final Rule. at 64,722.

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.'"[258]

EPA provided several reasons to support its determination that the CPP BSER yielded an achievable standard: the BSER "may be implemented through a range of methods, including" credits and trading; the BSER measures have significant "headroom"; and the standards "apply on an annual or longer basis, so that short-term issues need not jeopardize compliance."[259] Moreover, for the nationally applicable performance rate, EPA used the least stringent regional rate, thereby ensuring that the rate would be achievable in every region.[260]

In the CPP, EPA also explained why the BSER was the "'best,' 'taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements."[261] EPA explained the substantial judicial precedent, including from the Supreme Court, designating it as the "expert agency" to balance "competing interests . . . . Along with the environmental benefit potentially achievable, our Nation's energy needs and the possibility of economic disruption must weigh in the balance."[262] The D.C. Circuit has also advised that "section 111 regulations concerning the electric power sector 'demand a careful weighing of cost, environmental, and energy considerations.'"[263] Indeed, EPA gave significant weight to each of those factors in the CPP.

In addition to considering "nonair quality health and environmental impact[s]," EPA should analyze the effects of a BSER on air quality.[264] Congress's first enumerated purpose of CAA Title I (which includes section 111) 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."[265] Administrator Pruitt must avoid a BSER that would have the perverse consequence of increasing dangerous air pollution, including criteria pollutants – a danger that could arise due to the rebound effect of a poorly designed BSER (see section VI.A). In the CPP, EPA described the rebound effect as it pertained to carbon pollution,[266] but a BSER's effect on other health-harming pollutants is also a rational component of the inquiry into the "best" system.

Given the cited findings above – as well as voluminous additional analysis not discussed here – EPA determined that the CPP BSER was "best."[267] As it did when analyzing the factors above, EPA made this determination "[i]n light of [the] characteristics of the utility power sector,

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[258] *Id.* (quoting *Essex Chem. Corp.*, 486 F.2d at 433–34).
[259] *Id.* at 64,752.
[260] *See id.*; *see also id.* at 64,742.
[261] *See id.* at 64,777-79..
[262] CPP Final Rule at 64,778 (quoting *American Electric Power Co. v. Connecticut*, 131 S. Ct. 2527, 2539–40 (2011)).
[263] *Id.* at 64,778 (quoting *Sierra Club v. EPA*, 657 F.2d 298, 406 (D.C. Cir. 1981)).
[264] *See id* at 64,751 (noting that the CPP was "expected to reduce emissions of non-$CO_2$ air pollutants such as $SO_2$, NOx, and mercury.").
[265] 42 U.S.C. § 7401(b)(1).
[266] *See* CPP Final Rule at 64,745.
[267] *Id.* at 64,769.

as well as the characteristics of $CO_2$ pollution."[268] In particular, EPA noted "[t]he fungibility of electricity, coupled with the integration of the utility power sector," and "that $CO_2$ is particularly well-suited for [measures in the CPP BSER] because it is a global, not local, air pollutant."[269] EPA observed that some commenters had advocated for a narrower BSER interpretation but determined, "Imposing such a restrictive interpretation—one which is not called for by the statute—would be inconsistent with CAA section 111's specific requirement that standards be based on the 'best' system of emission reduction and . . . would be inconsistent with Congressional design that the CAA be comprehensive and address the major environmental issues."[270]

*5. The Clean Power Plan is broadly supported.*

In litigation over the merits of the CPP, a broad coalition of Americans submitted filings to the U.S. Court of Appeals for the D.C. Circuit supporting the rule. Supporters included 18 States,[271] 60 municipalities,[272] power companies,[273] sustainable business organizations,[274] public health organizations,[275] faith communities,[276] and many more.[277] EPA's proposal to repeal the CPP was met with renewed affirmations of support for the rule.[278]

## B. The Repeal Proposal on which the ANPR is Premised Is Unlawful on Additional Grounds, and Accordingly Cannot Be the Basis for this ANPR.

Administrator Pruitt's proposal to repeal the CPP is legally infirm for reasons additional to, and independent of, the proposal's reliance on flawed and inadequate statutory analysis and startlingly inadequate factual review. As EDF and a coalition of other environmental and health organizations noted in initial comments filed in the repeal rulemaking on January 29, 2018, Administrator Scott Pruitt's participation in the rulemaking renders that rulemaking (including any final repeal rule resulting from it) unlawful because of a profusion of statements Pruitt has made demonstrating that he has an unalterably closed mind with respect to the CPP repeal

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[268] *Id.*
[269] *Id.*
[270] *Id.* (citing *King v. Burwell*, No. 14–114 (2015) (slip op., at 21) (''But in every case we must respect the role of the Legislature, and take care not to undo what it has done.'')).
[271] *See* Brief for State & Municipal Respondent-Intervenors, *West Virginia v. EPA*, No. 15-1363 (D.C. Cir. Apr. 22, 2016).
[272] *See id.*; *see also* Brief of *Amici Curiae* the National League of Cities; the U.S. Conference of Mayors; and 54 cities, counties, and Mayors in Support of the U.S. Environmental Protection Agency, *West Virginia v. EPA*, No. 15-1363 (D.C. Cir. Apr. 1, 2016).
[273] *See* Final Brief of Intervenors Calpine Corp. et al. in Support of Respondents, *West Virginia v. EPA*, No. 15-1363 (D.C. Cir. Apr. 22, 2016).
[274] *See Amici Curiae* Brief of Sustainable Business Organizations in Support of Respondent, *West Virginia v. EPA*, No. 15-1363 (D.C. Cir. Apr. 1, 2016).
[275] *See* Brief of the American Thoracic Society et al. as *Amici Curiae* in Support of Respondents, *West Virginia v. EPA*, No. 15-1363 (D.C. Cir. Apr. 1, 2016).
[276] *See* Brief of *Amici Curiae* Catholic Climate Covenant et al. in Support of Respondents, *West Virginia v. EPA*, No. 15-1363 (D.C. Cir. Apr. 1, 2016).
[277] *See* EDF, List of Supporters of the Clean Power Plan in Court, https://www.edf.org/sites/default/files/content/list_of_supporters_of_the_clean_power_plan_in_court.pdf.
[278] *See* EDF, Comments Opposing Scott Pruitt's Rollback of the Clean Power Plan: October 2017—February 2018, (Feb. 20, 2018), http://blogs.edf.org/climate411/files/2018/02/Comments-Opposing-Scott-Pruitt.pdf.

proposal – including various statements that describe the repeal of the CPP as a fait accompli, despite the fact that the public comment process does not close for months. As our January 29 comments demonstrate, Pruitt's statements improperly and illegally render the public comment process a hollow exercise that cannot possibly affect the outcome; he has violated established constitutional and statutory principles designed to protect the fundamental fairness of the rulemaking process, including the public's right to participate meaningfully.[279] Exhaustive comments submitted in the CPP repeal docket by a coalition of State and local governments on January 9, 2018, similarly demonstrate that Administrator Pruitt's participation in the CPP Rulemaking violates constitutional standards and federal ethical rules.[280] Since these submissions were filed, Administrator Pruitt has continued to make statements that constitute obvious violations of the fundamental principle that administrators cannot preside over rulemakings as to which they have an "unalterably closed mind." On January 31, 2018, he told a group of State officials that "we're getting rid of" the CPP.[281]

Wholly apart from the proposal's substantive flaws, finalizing the repeal proposal would be unlawful because of Administrator Pruitt's participation. Therefore, premising this ANPR upon the assumption that the repeal proposal is lawful is, for this reason as well, legally misguided and likely to lead to further confusion and delays in implementing EPA's statutory obligation to protect the public from harmful power plant carbon dioxide emissions.

### C. In the ANPR, EPA Inappropriately Assumes the Legal Conclusion Of Its Proposed CPP Repeal.

Repeatedly throughout the ANPR, EPA states that it is soliciting only those comments that conform to the interpretation of section 111 in the Agency's recently proposed repeal of the CPP. For example, EPA states that it "is requesting comment on how the program should be implemented assuming adoption of that proposed interpretation"[282]; "is soliciting information on systems of emission reduction that are in accord with the legal interpretation discussed in the CPP repeal proposal"[283]; and "solicits comment . . . on the Best System of Emission Reduction (BSER) in this context under the statutory interpretation contained in the proposed repeal of the CPP."[284]

With this narrow focus, EPA has set in motion a thoroughly misguided comment solicitation. Pursuant to a separate, ongoing rulemaking, EPA is currently accepting public comment about its legal interpretation of the BSER. Through that rulemaking, the Agency is required to evaluate the administrative record objectively and reach a conclusion that reflects the

[279] *See* Comments on EPA Administrator Scott Pruitt's Improper Prejudgment of the Outcome of Proposed Repeal of Clean Power Plan, (Jan. 29, 2018), Docket No. EPA-HQ-OAR-2017-0355-17195, Attachment U.
[280] *See* States and Cities, Comments on EPA Administrator Scott Pruitt's Improper Prejudgment of Outcome of Proposed Repeal of Clean Power Plan, (Jan. 9, 2018), Docket No. EPA-HQ-OAR-2017-0355-7861, Attachment Y.
[281] Niina Heikkinen, *Pruitt Publically Lauds Trump After 2016 Criticisms Resurface*, E&E News, (Feb. 1, 2018), https://www.eenews.net/climatewire/2018/02/01/stories/1060072579 (quoting the Administrator as saying, "The Clean Power Plan, that was an overreach that was stayed by the Supreme Court. We're getting rid of that and providing a substitute").
[282] 82 Fed. Reg. at 61,512.
[283] *Id.* at 61,511.
[284] *Id.* at 61,509.

facts and the law. At the same time, EPA is proceeding with this ANPR on the express premise that its proposed BSER interpretation strictly circumscribes the available options. Either the Agency has recklessly foreclosed the very measures that it previously considered the "best" before finalizing any legal basis for doing so, or EPA has already prejudged the outcome of the proposed CPP repeal, rendering that proceeding a formalistic charade.

Either way, EPA would be gravely mistaken to limit measures it is considering for replacing the CPP to those countenanced by the proposed repeal. As discussed above, determining a BSER for a source and pollutant is a fact-intensive inquiry. Congress charged EPA, as the expert agency, with the essential task of weighing all of the relevant factors and determining which system is "best." In the proposed repeal, the Agency invents a preliminary step: contriving an interpretation of "best system of emission reduction" that it believes would drastically limit the available pollution-reduction measures, before commencing its analysis of the problem at hand. The contrast with EPA's rigorous analysis when developing the CPP is stark. For the CPP, EPA carefully evaluated the BSER factors that Congress embedded in the statute and evaluated a full suite of potential systems of emission reduction. With the proposed repeal and ANPR, EPA seeks to impose an extra-statutory constraint that – by limiting the scope of its BSER inquiry – would, if applied as EPA appears determined to apply it, severely diminish its analysis of the factors that Congress actually directed it to consider.

EPA must perform a full analysis of the affected sources and pollutant in light of the statutory factors. Interpreting "BSER" to exclude a large set of pollution-reduction measures may be a convenient shortcut to the Agency's desired outcome, but it falls far short of the work that Congress directed it to perform.

## VI. IF EPA DETERMINES THAT THE CLEAN POWER PLAN CANNOT BE IMPLEMENTED, A REPLACEMENT RULE MUST BE BASED ON A "BEST SYSTEM" THAT REFLECTS EVALUATION OF THE FULL SUITE OF EMISSION REDUCING OPTIONS THAT EXISTS AND THAT ACHIEVES MAXIMUM FEASIBLE CONTROL.[285]

As explained above, EPA is wrong to assume the legal conclusion of its proposed repeal, and to limit itself to a narrow range of site-constrained options when developing a replacement. Even under EPA's proposed reading of the statute, numerous available measures are capable of achieving substantial emissions reductions – including measures that reflect the core features of the CPP BSER. As EPA recognized in the CPP, some of these options are neither as cost-effective nor widely-utilized as the measures that are reflected in the CPP BSER. The record for the CPP also indicates it is highly likely that, in practice, owners and operators of power plants will utilize the generation-shifting measures reflected in the CPP *regardless* of the "best system" that EPA adopts in a replacement rule.[286] Nevertheless, EPA must thoroughly consider all available options, including reduced utilization, and ensure that whatever "best system" it adopts

[285] This section responds to questions 1(b), 2, and 3(a) from the ANPR. *See* 82 Fed. Reg. at 61,511.
[286] *See, e.g.*, CPP Final Rule at 64,728.

fulfills the statutory imperative to establish carbon pollution limits that achieve maximum feasible emissions control and adequately addresses the urgent threat of climate change.[287]

Notably, the ANPR considers only *two* of the options discussed below – heat rate improvements and carbon capture and sequestration ("CCS"), giving only glancing consideration to CCS – even though EPA has previously evaluated other options, such as natural gas co-firing and conversion, as part of the CPP rulemaking record and Prevention of Significant Deterioration (PSD) permitting guidance. As discussed above, the ANPR also completely fails to consider the possibility that the CPP BSER itself – which contemplates that existing power plants would reduce their utilization by an amount that is commensurate with Building Blocks 2 and 3 – comports with EPA's new proposed interpretation of section 111(a)(1). The blinkered assessment of on-site systems of emission reduction that appears in the ANPR would be wholly inadequate if EPA proceeds with a rulemaking to replace the CPP. Indeed, EPA's obligation to engage in a searching examination of available systems of emission reduction is all the heavier if it voluntarily disrupts the feasible, cost-effective framework reflected in the CPP.

## A. Discussion of On-Site Options.

### *1. Co-Firing and Conversion to Natural Gas.*

Increased co-firing with natural gas at existing coal-fired steam electric generating units, or wholesale conversion of those units to natural gas, is an adequately demonstrated and potentially cost-effective way of reducing carbon pollution and can yield significant reductions in co-pollutants. Even though the Agency extensively considered this option in developing the CPP, EPA neglects to even mention it in the ANPR.

*Technical Feasibility:* The technology to co-fire natural gas or convert a coal-fired utility boiler to burn natural gas has been well-established for decades and is commercially available. In fact, natural gas co-firing is currently used for a variety of reasons, including for emissions control, to make up for the low energy content of Western coals, and to assist with startup. According to Andover Technology Partners, natural gas has been used as early as the 1990s as a means for NOx emissions control through a process known as reburning.[288] Natural gas co-firing is common at facilities that converted from Eastern to Western coal, where it is used to make up for the low Btu values of Western coals in boilers originally designed to combust Eastern coals.[289] Natural gas is also frequently co-fired in coal-fired utility boilers during start-up as gas igniters heat up the furnace in order to allow ignition of the coal. Analysis by Andover shows that facilities that start up on gas have the ability to burn at least 10% of the heat input on gas through the gas igniters at no additional capital cost, and in some cases the boiler is designed to accept higher levels of gas without additional modifications.[290]

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[287] *See supra* Section IV.

[288] Andover Technology Partners, Natural Gas Conversion and Cofiring for Coal-Fired Utility Boilers (2014), Attachment B.

[289] EDF, Comments of Environmental Defense Fund on EPA's Proposed Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Generating Units, at 143 (Dec. 1, 2014), Attachment F [Hereinafter "EDF CPP Comments"].

[290] Andover Technology Partners, Natural Gas Conversion and Cofiring for Coal-Fired Utility Boilers (2014), Attachment B.

Power companies have also been converting coal-fired units to burn natural gas as a primary fuel for over a decade.[291] Although conversion of a boiler to operate primarily on natural gas involves some physical modifications to the facility, these are often relatively modest. Coal-to-gas conversion projects can usually be accomplished without replacing the existing boiler, and often entail only construction of the natural gas delivery infrastructure – if not already available – and modifications to burners and ducts.[292] According to Andover, many such projects can be completed during periods when a plant is offline for maintenance and, excluding any pipeline construction, most projects take only a few months to complete.[293]

During the development of the CPP in 2013, EPA evaluated the distance of natural gas pipelines to coal plants to assess the potential for coal-to-gas conversions. EPA found that 25% of the existing coal fleet was within 25 miles of a natural gas pipeline.[294] Since then, there has been significant development of natural gas infrastructure. In 2015, the DOE looked at natural gas use in the U.S. under a carbon policy for power plants and found that new interstate pipelines would likely not be necessary even under a high natural gas demand case, due in part to natural gas pipelines being underutilized.[295] A 2015 report by the Advanced Energy Economy Institute, which included modeling by ICF International, also found that compliance with the CPP, even under high gas usage scenarios, would only modestly increase gas infrastructure needs. The report noted ongoing changes in the U.S. natural gas market that are driving increases in pipeline infrastructure independent of the CPP.[296]

According to a 2014 report by Andover Technology Partners included in the record for the CPP, at least 24 announced coal-to-gas conversions or co-firing projects in 19 States are expected to be completed by 2020.[297] Some studies have suggested that there could be more than 50 such conversions in 26 States at various stages of planning and development.[298] In its January 2017 Reconsideration Denial, EPA reported over 12 GW of capacity across 19 States that have switched their primary fuel from coal to natural gas.[299] Examples of plants that have converted from coal to natural gas include four coal-fired units at Southern Company's Ernest C. Gaston

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[291] *See, e.g.*, Black & Veatch, A Case Study on Coal to Natural Gas Fuel Switch (2012) (describing the well-understood process for converting a coal-fired unit to run entirely on natural gas).
[292] Babcock & Wilcox, Natural Gas Conversions of Existing Coal-Fired Boilers (2010).
[293] Andover Technology Partners, Natural Gas Conversion and Cofiring for Coal-Fired Utility Boilers (2014), Attachment B.
[294] *See* EPA Documentation for Base Case v.5.13: Emission Control Technologies, Chapter 5 and Table 5-22, https://www.epa.gov/airmarkets/documentation-base-case-v513-emission-control-technologies.
[295] Department of Energy, Natural Gas Infrastructure Implications of Increased Demand from the Electric Power Sector (Feb. 2015), Attachment E, https://energy.gov/sites/prod/files/2015/04/f22/QER%20Analysis%20-%20Natural%20Gas%20Infrastructure%20Implications%20of%20Increased%20Demand%20from%20the%20Electric%20Sector.pdf.
[296] Advanced Energy Economy, Impacts of the Clean Power Plan on U.S. Natural Gas Markets and Pipeline Infrastructure (June 2015).
[297] Andover Technology Partners, Natural Gas Conversion and Cofiring for Coal-Fired Utility Boilers (2014), Attachment B; *see also* EDF CPP Comments at 135-136.
[298] *See* Sourcewatch, *Coal Plant Conversion Projects*, (last visited Feb. 23, 2018), https://www.sourcewatch.org/index.php/Coal_plant_conversion_projects.
[299] CPP Reconsideration Denial: Appendix 3, at 19.

station near Wilsonville, Alabama and two coal-fired units at Appalachian Power's Clinch River Power Plan in Virginia.[300]

*Cost:* Natural gas co-firing has long been recognized as a cost-effective option for coal-fired boilers to reduce emissions of criteria and hazardous pollutants. In the final Carbon Pollution Standards for new, modified, and reconstructed electric generating units, EPA also found natural gas co-firing to be cost-effective for achieving carbon emission limitations. EPA estimated that the LCOE for a new supercritical pulverized coal to meet the final standard of performance was lower using co-firing compared to partial carbon capture and storage (CCS) – $92/MWh for 34% natural gas co-firing compared to $99/MWh for 16% partial CCS.[301]

Indeed, the fact that many conversion projects have recently been completed or are currently underway demonstrates that costs are reasonable. According to Andover, many power companies are undertaking coal-to-gas conversions because they sometimes represent the most economical option for complying with emission limitations.[302]

While the cost of fuel-switching boilers is minimal for units that are already designed to burn natural gas, the cost of more extensive retrofits is still moderate.[303] In its proposed Carbon Pollution Standards for Modified and Reconstructed Electric Generating Units, EPA estimated the costs of avoided carbon pollution from a conversion project to be in the range of $75 to $83 per metric ton.[304] EPA estimated that conversion to natural gas would increase a unit's fuel costs by approximately $30/MWh, increase capital costs by $5/MWh, and reduce fixed costs by 33% and variable operating costs by 25%.[305]

There is evidence however to suggest that EPA's cost estimates are unrealistically high. According to Andover, EPA's capital cost estimates include all possible modifications that might be necessary as a result of a coal-to-gas conversion, rather than the more modest modifications that are typically required at the average plant. Andover's survey of coal to gas conversions found that typical capital costs are close to $3/MWh, roughly 40% lower than EPA's estimate.[306] Moreover, recent natural gas price projections show lower natural gas prices than previously projected.[307]

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[300] *Id.* at 3; *see also* Scott Gossard, *Coal-to-Gas Plant Conversions in the U.S.*, Power Engineering (June 18, 2015), http://www.power-eng.com/articles/print/volume-119/issue-6/features/coal-to-gas-plant-conversions-in-the-u-s.html.
[301] GHG NSPS Final Rule, at Table 9. EPA assumed a natural gas price of $6.19/MMBtu – higher than more recent natural gas price projections.
[302] Andover Technology Partners, Natural Gas Conversion and Cofiring for Coal-Fired Utility Boilers (2014), Attachment B.
[303] EDF CPP Comments at 140.
[304] 79 Fed. Reg. at 34,982.
[305] EPA, GHG Abatement Measures Technical Support Document, at 6-4 (June 2014), Attachment M.
[306] Andover Technology Partners, Natural Gas Conversion and Cofiring for Coal-Fired Utility Boilers (2014), Attachment B.
[307] EPA's analysis used $5.36/MMBtu for natural gas, *see* GHG Abatement Measures Technical Support Document. EIA's most recent 2018 Annual Energy Outlook projects natural gas prices will remain well below $5/MMBtu through 2030, *see* U.S. Energy Information Administration, *Annual Energy Outlook 2018*, (Feb. 6, 2018) https://www.eia.gov/outlooks/aeo/pdf/AEO2018_FINAL_PDF.pdf .

EPA also assumed that a unit converting to natural gas would need to build a 50-mile pipeline at a cost of $50 million.[308] EPA's analysis shows that building even a long pipeline is typically a relatively small part of the cost of converting a unit to burn natural gas.[309] In other words, units can undergo conversion at reasonable cost even when they are located at a significant distance from existing pipeline infrastructure. In addition, for most units, the cost of building a pipeline is likely to be less than EPA assumed.

Even where retrofit costs are significant, the conversion to natural gas is cost-effective and can be achieved in a manner than enables electricity consumers to save money as a result of reductions in a unit's fixed and variable operating costs.[310] Conversion to natural gas would likely reduce the energy requirements of the unit because natural gas units have lower parasitic loads. Unit conversion also reduces electricity demand for fuel preparation which includes coal transport, crushing, and pulverizers. The reduction in parasitic load in turn leads to an increase in net output.[311]

*Environmental and Health Impacts:* Co-firing with or switching to natural gas has significant potential for reducing carbon emissions from coal-fired steam electric generating units. EPA's analysis for the proposed CPP showed that 10% natural gas co-firing at a utility boiler could lead to an emission rate of 2,021 lbs $CO_2/MWh_{net}$, roughly 4% lower than 100% coal firing.[312] Fifty percent natural gas co-firing could lower the emission rate to 1,673 lbs $CO_2/MWh_{net}$, representing a 21% reduction.[313] Switching to 100% natural gas at fossil steam units could reduce the $CO_2$ emission rate by 42.8%.[314] Indeed, according to case studies by Andover, five units that have already completed conversions have reported average 38% reduction in $CO_2$ emission rates.[315]

In the proposed CPP, EPA also reasonably estimated that converting to 100% natural gas would significantly reduce a unit's emissions of sulfur dioxide ("$SO_2$"), NOx, and PM2.5.[316] The five completed conversion projects documented in the Andover report show average emission rate reductions of 99% for $SO_2$ and 48% for NOx.[317] These pollutants' serious health impacts are well documented. According to EPA, the value of the health benefits associated with these

[308] GHG Abatement Measures Technical Support Document (June 2014) at 6-4.
[309] EPA's analysis shows that increased fuel costs are responsible for most of the cost of natural gas conversion, see GHG Abatement Measures Technical Support Document (June 2014) at 6-4 to 6-5.
[310] *See e.g.* Testimony of Alan Mihm before the Wisconsin Public Service Commission (Aug. 20, 2013) (supporting Wisconsin Electric Power Company's application to convert the Valley power plant from coal to gas, estimating that the cost of the conversion would be $62 million and "rates for electric customers will go down by .31%, for a net savings of $10.2 million in 2016").
[311] EDF CPP Comments at 142.
[312] GHG Abatement Measures Technical Support Document (June 2014) at 6-6, Table 6-1.
[313] EDF CPP Comments at 143.
[314] CPP Reconsideration Denial: Appendix 3 at 16.
[315] Andover Technology Partners, Natural Gas Conversion and Cofiring for Coal-Fired Utility Boilers, 3 (2014), Attachment B.
[316] GHG Abatement Measures Technical Support Document (June 2014) at 6-6, Table 6-2. EPA estimated that 100% natural gas conversion would reduce $SO_2$ emissions by 3.1 $lb/MWh_{net}$, $NO_x$ by 2.04 $lb/MWh_{net}$, and PM2.5 by 0.2 $lb/MWh_{net}$.
[317] Andover Technology Partners, Natural Gas Conversion and Cofiring for Coal-Fired Utility Boilers (2014).

reductions are estimated to be between $67/MWh_{net}$ and $150/MWh_{net}$ – a factor of at least two times the cost associated with conversion.[318]

Switching to natural gas firing at existing units also has substantial non-air health and environmental benefits. For instance, coal-to-gas conversion eliminates an existing unit's production of coal combustion residuals or coal ash, an industrial waste that contains toxic substances such as arsenic, selenium, and cadmium. Conversion to natural gas also reduces on-site water quality impacts.[319]

*2. Carbon Capture and Storage on Coal and Natural Gas.*

CCS has been successfully implemented at multiple projects around the world during the past few decades, and EPA should consider CCS as a potential BSER for existing coal and natural gas electric generating units.[320] This system may be particularly appropriate as a BSER for subcategories of units that are located near geologic sequestration sites or existing $CO_2$ pipeline networks.

*Technical Feasibility:* In promulgating New Source Performance Standards for carbon pollution from new, modified, and reconstructed power plants, EPA discussed in great detail both the technology and feasibility of CCS to limit carbon pollution emissions from new fossil fuel-fired electric generating units.[321] EPA found that CCS has been adequately demonstrated in full-scale operations at steam electric generating units, and is the system that achieves the greatest degree of emission reduction from those units at acceptable cost. EPA therefore determined that the BSER for new steam generating units is a highly efficient supercritical pulverized coal boiler using partial post-combustion CCS technology to meet the final emission limit of 1,400 lb $CO_2/MWh_{gross}$.[322] EPA estimated that this standard could be met by capturing and storing approximately 16% of the $CO_2$ produced at a bituminous plant and 23% of the $CO_2$ produced at a sub-bituminous or dried lignite plant.[323]

For existing steam generating units, retrofit CCS is also broadly available across the U.S. A 2010 study by DOE's National Energy Technology Laboratory (NETL) evaluated the feasibility of retrofitting capture technology at existing power plants, using aerial and satellite images of various power plant sites, and concluded that no sites were totally infeasible for retrofit.[324] The Clean Air Task Force commissioned Charles River Associates to model the CPP

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[318] GHG Abatement Measures Technical Support Document (June 2014) at 6-7, Table 6-3, Attachment B. Even with a steep 7% discount rate, EPA estimated the health benefits of reducing co-pollutants through 100% natural gas conversion to be between $61/MWh_{net}$ and $140/MWh_{net}$. EPA estimated the value of the health benefits associated with 10% natural gas co-firing to be between $6.5/MWh_{net}$ and $15/MWh_{net}$. *Id.*

[319] EDF CPP Comments at 14.

[320] There are currently 17 large-scale CCS facilities operating globally and an additional four coming on stream in 2018. *See* Global CCS Institute, *The Global Status of CCS: 2017*, http://www.globalccsinstitute.com/sites/www.globalccsinstitute.com/files/uploads/global-status/1-0_4529_CCS_Global_Status_Book_layout-WAW_spreads.pdf.

[321] *See* GHG NSPS Final Rule; Literature Survey of Carbon Capture Technology Technical Support Document.

[322] *Id.*

[323] *Id.*

[324] *See* IEAGHG, Retrofitting $CO_2$ Capture to Existing Power Plants (May 2011) at 84, 86, http://ieaghg.org/docs/General_Docs/Reports/2011-02.pdf; *see also* Clean Air Task Force, Comments on EPA's

using more accurate and updated assumptions about CCS that reflect real world information.[325] Modeling results demonstrated that 10 GW or more of carbon capture with enhanced oil recovery (EOR) sequestration would be built in 3 States by 2030 and an additional 6 GW would be built in the rest of the continental U.S.[326] Another study by well-regarded power engineering experts at Carnegie Mellon University concluded that up to 60 GWs of coal-fired generation might be amenable to CCS – roughly 20% of the coal-fired fleet.[327]

Since finalizing the New Source Performance Standards and the CPP, at least one additional retrofit project on an existing steam generating unit has been completed: the Petra Nova project, which is a commercial-scale post-combustion carbon capture project at Unit #8 of NRG Energy's W.A. Parish generating station. The project is designed to capture approximately 90% of the $CO_2$ from a 240 MW slip-stream of the 610 MW W.A. Parish facility – roughly 35% of the plant's total carbon pollution emissions. The project was originally envisioned as a 60 MW slip-stream demonstration and received DOE Clean Coal Power Initiative funding on that basis. However, the project was later expanded to the larger 240 MW slip-stream in order to capture greater volumes of $CO_2$ for EOR. No additional federal funding was obtained for the expansion. The Petra Nova project started operation in January 2017 and will capture approximately 1.6 million tons of $CO_2$ each year.[328]

Another project that further demonstrates the feasibility of retrofitting CCS to an existing power plant is the Boundary Dam Unit 3 CCS project in Canada which is operated by SaskPower.[329] Recent data shows that since operation began in October 2014, the unit has captured over 1.8 million metric tons of $CO_2$.[330] CCS is also being utilized at other non-utility industrial sources. In April 2017, the world's first large-scale bioenergy with CCS facility was launched into operation in Illinois.[331]

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Proposed Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Generating Units, at 38-39 (Dec. 1, 2014), Attachment D [Hereinafter "Clean Air Task Force CPP Comments"].

[325] *See* Clean Air Task Force CPP comments.

[326] *See id.* Charles River Associates replicated EPA's proposed Clean Power Plan policy case using updated CCS assumptions to evaluate CCS in Texas, Oklahoma, and Mississippi. These three states were chosen due to the kinds of EOR activities currently underway there, which are representative of EOR activity taking place elsewhere in the country. These states are also in close physical proximity to one another making modeling simpler.

[327] Hai, Haibu, Yang, Ou, and Edward S. Rubin, U.S. Coal-Fired Power Plants via $CO_2$ Capture, Utilization, and Storage (May 2015), http://www.cmu.edu/epp/iecm/rubin/PDF%20files/2015/Pages%20from%20Zhai_Rubin_CCUSretrofits_ES&T_2015.pdf; *see also* CPP Reconsideration Denial: Appendix 3, at 16.

[328] *See* NRG, *Petra Nova – WA Parish Generating* Station, http://www.nrg.com/generation/projects/petra-nova/; Umair Irfan, *World's Largest Carbon Capture Retrofit On Track To Open*, (Oct. 4, 2016), http://www.eenews.net/climatewire/2016/10/04/stories/1060043791; Chris Mooney, *America's First 'Clean Coal' Plant Is Now Operational — and Another Is on the Way*, Washington Post, (Jan. 10, 2017); https://www.washingtonpost.com/news/energy-environment/wp/2017/01/10/americas-first-clean-coal-plant-is-now-operational-and-another-is-on-the-way/?utm_term=.69047055d77e; *see also* CPP Reconsideration Denial: Appendix 3.

[329] CPP Reconsideration Denial: Appendix 3 at 4.

[330] *See* Global CCS Institute, *The Global Status of CCS: 2017*, http://www.globalccsinstitute.com/sites/www.globalccsinstitute.com/files/uploads/global-status/1-0_4529_CCS_Global_Status_Book_layout-WAW_spreads.pdf; SaskPower, *BD3 Status Update: December 2017* (Jan. 8, 2018), http://www.saskpower.com/about-us/blog/bd3-status-update-december-2017/.

[331] SaskPower, *BD3 Status Update: December 2017* (Jan. 8, 2018), http://www.saskpower.com/about-us/blog/bd3-status-update-december-2017/.

Opportunities to store captured $CO_2$ are also widely available across the country. In the Carbon Pollution Standards rulemaking, EPA discussed in great detail the geographic availability of geologic sequestration,[332] and since EPA finalized the Carbon Pollution Standards and the CPP, DOE has published additional information that continues to show that geologic sequestration is available throughout most of the United States.[333] This data identifies 39 States with potential onshore and offshore deep saline formation storage resources; EOR operations are currently being conducted in 12 States with an additional 17 States having geology that may be amenable to EOR operations.[334] The data also show 20 States within 100 km of an active EOR location and 13 States that have operating $CO_2$ pipelines.[335] DOE also estimates potential storage capacity of approximately 2,420 billion metric tons to more than 21,299 billion metric tons of $CO_2$ in the U.S. from deep saline formations, oil and gas reservoirs, and un-mineable coal seams.[336] This includes estimates for onshore storage and offshore storage in federal waters. Deep saline formations offer the largest geologic sequestration potential and DOE estimates that areas of the U.S. with appropriate geology have a sequestration potential of at least 2,182 billion metric tons of $CO_2$ in deep saline formations.[337]

According to the Pipeline and Hazardous Materials Safety Administration, there were 5,233 miles of $CO_2$ pipeline operating in the U.S. in 2015 – roughly a 62% increase in $CO_2$ pipeline miles since 2004.[338] Many States have also adopted a legal infrastructure to facilitate CCS.[339]

*Cost:* In the New Source Performance Standard, EPA found that the cost of a new supercritical pulverized coal boiler unit with partial CCS was comparable to the cost of new baseload generating technologies – other than natural gas combined cycle – such as nuclear.[340]

The decision of whether or not to retrofit a plant with CCS depends on several factors including close proximity to EOR sites or pipelines, the costs of capturing $CO_2$, transporting it by pipeline, and the revenue that a power plant owner receives for selling the $CO_2$ to the oil field. NETL estimated the cost of capture to be just over $70 per metric ton of $CO_2$ at an existing pulverized coal power plant and close to $90 per metric ton of $CO_2$ at an existing natural gas combined cycle plant.[341] Based on their CPP modeling, the Clean Air Task Force concluded that CCS-EOR carbon pollution reductions are economically feasible and would result in small but

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[332] *See* the final rulemaking for the Carbon Pollution Standards (80 Fed. Reg. 64,510) and the "Geographic Availability" technical support document.
[333] *See* CPP Reconsideration Denial: Appendix 3 at 6.
[334] *Id.*
[335] *Id.*
[336] *See id.* at 7.
[337] *See id.* at 8.
[338] *See id.* at 9.
[339] *See id.* at 10.
[340] *See* GHG NSPS Final Rule at 64,510.
[341] *See* Kristin Gerdes, *NETL Studies on the Economic Feasibility of the $CO_2$ Capture Retrofits for the U.S. Power Plant Fleet*, U.S. Dep't of Energy, (Jan. 9 2014), http://netl.doe.gov/File%20Library/Research/Energy%20Analysis/Publications/NETL-Retrofits-Overview-2014-01-09-rev2.pdf.

meaningful decreases in total system costs in the regions encompassing Texas and Oklahoma, where CCS is retrofit.[342]

*Emission Reductions:* CCS on existing coal and natural gas generating units has the potential to yield significant carbon pollution reductions. The Clean Air Task Force modeling showed that CCS-EOR retrofits could reduce carbon pollution emissions by nearly 85 million metric tons per year, or about 14% of the total annual reductions achieved nationwide in 2030 by the CPP, as compared to 2012 emissions.[343] In its January 2017 Reconsideration Denial, EPA estimated that 90% CCS applied to 20% of fossil steam units could yield an 18% $CO_2$ emission rate reduction for fossil steam from 2012 levels.[344] EPA also estimated that a combination of switching to 100% natural gas at 80% of the fossil steam units and applying 90% CCS at 20% of fossil steam units could result in a 52.3% emission rate reduction for fossil steam from 2012 levels.[345]

*3. On-Site Integration and Utilization of Renewable Energy Technologies.*

Power companies have been experimenting with on-site renewable energy integration and co-location with fossil fuel-fired generation for the past decade, and EPA should explore this option for reducing carbon pollution emissions at affected units.

Concentrated Solar Power (CSP) is currently one of the renewable energy technologies with the highest potential for integration with existing fossil fuel-fired power plants. The two types of CSP technology that are available for integration are: (1) parabolic trough power plants which consist of a solar field filled with hundreds or thousands of solar collector assemblies, and (2) power tower systems where a large number of flat, sun-tracking mirrors known as heliostats focus sunlight onto a receiver at the top of a tall tower. A heat transfer fluid heated in the receiver is used to heat a working fluid, which is then used in a conventional turbine generator to produce electricity.

A study by DOE's National Renewable Energy Laboratory showed that in 16 States, parabolic trough CSP technology could contribute to about 1% to total energy generation and power towers could contribute to up to 2.2%.[346] NREL found that the total potential carbon pollution emissions avoided in those 16 States was 11.5 million metric tons from parabolic trough augmentation and 30 million metric tons from power tower augmentation at existing plants.[347] In addition to reducing carbon pollution emissions, parabolic trough and power tower augmentation were projected to contribute to lower $SO_2$ and NOx emissions.[348]

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[342] *See* Clean Air Task Force CPP comments.
[343] *Id.*
[344] *See* CPP Reconsideration Denial: Appendix 3, at 16, Table 5.
[345] *Id.*
[346] National Renewable Energy Laboratory, Solar-Augment Potential of U.S. Fossil-Fired Power Plants (Feb. 2011), Attachment W, https://www.nrel.gov/docs/fy11osti/50597.pdf. The NREL study followed up on a 2009 study by the Electric Power Research Institute (EPRI) and examined the use of CSP to augment power at coal and natural gas combined cycle plants in 16 states in the southeast and southwest.
[347] *Id.* at 20, Table 6.
[348] *Id.*

One demonstration of renewable energy integration is the Colorado Integration Solar Project.[349] The project was a hybrid CSP/coal plant using parabolic trough solar technology. A parabolic trough solar field provided thermal energy to produce supplemental steam for power generation at Xcel Energy's Cameo Station's Unit 2 (approximately 2 MW equivalent) in order to decrease the overall consumption of coal, reduce emissions from the plant, improve plant efficiency, and test the commercial viability of CSP integration. The plant was used for testing purposes until the coal plant was retired and the CSP plant was decommissioned.[350] Another demonstration is the Florida Power and Light Martin Next Generation Solar Energy Center.[351] This 75 MW project also uses parabolic trough technology and is the first hybrid solar facility in the world to connect to an existing natural gas combined cycle power plant. Construction began in December 2008 and was completed in 2010 and the facility continues to operate today.[352]

Co-located renewable energy resources also provide a unique opportunity for fossil fuel-fired generating units to take advantage of renewable energy generation. Examples of such projects include the Clean Path Energy Center project which involves a 680 MW natural gas combined cycle and a 70 MW solar photovoltaic (PV) array,[353] Tampa Electric Company's Big Bend Solar facility, which began commercial operation in February 2017 and includes a 23 MW solar PV array adjacent to Tampa Electric's Big Bend Power Station,[354] and Xcel Energy's Comanche Solar Project, which became operational in 2016 and includes a 156 $MW_{dc}$/120 $MW_{ac}$ solar project located next to Xcel's Comanche Generating Station.[355] The Comanche Solar Project has a 25-year power purchase agreement with Xcel Energy. The agreement was awarded as part of a competitive bid process where the project was found to be more cost-effective than natural gas on a dollar per megawatt hour basis.[356]

Tampa Electric's Big Bend Solar facility is expected to provide environmental savings of up to 30,000 tons of $CO_2$ every year[357] and Xcel's Comanche Solar Project is expected to result in 3.5 million tons of $CO_2$ reduction over its 25-year lifecycle.[358]

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[349] *See* CPP Reconsideration Denial: Appendix 3, at 11.
[350] *Id.*; *see also* NREL, Colorado Integrated Solar Project, (Nov. 21, 2013), https://www.nrel.gov/csp/solarpaces/project_detail.cfm/projectID=75.
[351] *See* CPP Reconsideration Denial: Appendix 3, at 11.
[352] *Id.*; *see also* NREL, Martin Next Generation Solar Energy Center, (Jan. 25, 2013), https://www.nrel.gov/csp/solarpaces/project_detail.cfm/projectID=267; Florida Power & Light, *Solar Energy Centers*, https://www.fpl.com/clean-energy/solar/energy-centers.html.
[353] *See* CPP Reconsideration Denial: Appendix 3, at 11.
[354] *Id.* at 12; *see also* Tampa Electric, *Tampa Electric Completes Bay Area's Largest Solar Project*, (Feb. 15, 2017), http://www.tampaelectric.com/company/mediacenter/article/index.cfm?article=897.
[355] *See* CPP Reconsideration Denial: Appendix 3, at 12.
[356] *See id.*; *see also* Community Energy Solar, *Comanche Solar*, https://communityenergysolar.com/project/comanche-solar/; NovatusEnergy, *Novatus Energy Acquires the 156 MW Comanche Solar Project in Colorado* (May 16, 2017), http://www.novatusenergy.com/novatus-energy-acquires-the-156-mw-comanche-solar-project-in-colorado/.
[357] Tampa Electric, *Tampa Electric Completes Bay Area's Largest Solar Project* (Feb. 15, 2017), http://www.tampaelectric.com/company/mediacenter/article/index.cfm?article=897.
[358] *See* Community Energy Solar, *Comanche Solar*, https://communityenergysolar.com/project/comanche-solar/; NovatusEnergy, *Novatus Energy Acquires the 156 MW Comanche Solar Project in Colorado* (May 16, 2017), http://www.novatusenergy.com/novatus-energy-acquires-the-156-mw-comanche-solar-project-in-colorado/.

*4. Coal Rank Improvements and Drying.*

Coal rank improvements and drying can contribute to lower carbon pollution emissions and should be considered by EPA.

Coal-fired power plants generally burn one of three types of coal: lignite, sub-bituminous, and bituminous. These different coal types or ranks have different properties (such as heating value, carbon and moisture content) that affect the carbon emission intensity of the coal. In general, lignite emits more carbon pollution per unit of heat input, followed by sub-bituminous coal, and bituminous coal with averages of 216.3, 211.9, and 205.3 lbs $CO_2$/MMBtu respectively.[359] In addition, due to the inherent moisture in sub-bituminous and lignite coals, all else being equal a bituminous coal-fired boiler is more efficient than a corresponding boiler burning sub-bituminous or lignite coal. Therefore, switching from a low to a high-rank coal will lower emissions.[360]

Low-rank coals are often used because of their low cost per unit of heat input relative to bituminous coal and their low sulfur content. However their high moisture content, typically 25 to 40% with lignite having the highest moisture content, can be a major disadvantage. As fuel moisture decreases, the heating value of the fuel increases so that less coal needs to be fired to produce the same amount of electricity. Drier coal is also easier to handle, convey, and pulverize, therefore reducing the burden on the coal-handling system. A boiler designed for dried coal is also smaller and has lower capital costs than a comparable boiler designed to burn coal that has not been dried. The pre-combustion drying of low-rank coals can therefore improve overall efficiency and several advanced coal drying technologies are either already or nearly commercially available.

One such example is Great River Energy which developed a coal drying technology for low-rank coals in partnership with the DOE as part of the DOE's Clean Coal Power Initiative. The technology has been successfully demonstrated on a pulverized coal-fired boiler burning lignite at the utility's Coal Creek Station and is now commercially available under the trade name DryFining™.[361] The DryFining™ process passes warm cooling water from the steam turbine exhaust condenser through an air heater where ambient air is heated before being sent to a fluidized bed coal dryer. At the Coal Creek Station, this process increased the energy content of lignite from 6,200 to 7,100 Btu/lb, thereby decreasing the fuel input into the boilers by 4% with a corresponding decrease in carbon pollution emissions.[362] Net gains in overall efficiency of 2 to 4% were also reported in addition to reductions in emissions of mercury, $SO_2$, and $NO_x$.[363]

RWE Power in Germany is also developing a fluidized bed drying technology for lignite, called WTA. A prototype commercial-scale drying plant using this process began operation in

[359] EPA, Available and Emerging Technologies for Reducing Greenhouse Gas Emissions From Coal-Fired Electric Generating Units (Oct. 2010), Attachment G.
[360] *Id.*
[361] *Id.*
[362] *Id.*
[363] *Id.*

2009 at the utility's Nederaussem Power Station site, with net gains in cycle efficiency on the order of 4 percentage points reported.[364]

Other coal drying technologies for low-rank coals in various stages of development include attrition milling of coal followed by air drying, compressing heated coarse crushed coal to squeeze out water, and heating wet coal under pressure.[365]

*5. Natural Gas Combined Cycle Heat Rate Improvement.*

Heat rate or efficiency improvements at existing natural gas combined cycle (NGCC) plants can be an effective way to both decrease the $CO_2$ emission rate and increase the potential output of those units.

The utilization of NGCC units has increased over the past few years due in large part to low natural gas prices. As such, NGCC units will likely experience more frequent maintenance intervals and may find investment in improvements more economically attractive than in the past when capacity factors were lower. Technology has also improved. Many NGCC units were installed more than a decade ago. Newer NGCC units utilize advanced materials that allow for operation at higher temperatures and higher efficiencies. New designs for seals or other components also reduce losses and improve performance.

A recent report by Andover Technology Partners demonstrates that there are several technologies that offer potential for improving heat rates at existing NGCC units.[366] One method to improve the heat rate of the gas turbine involves turbine inlet cooling. Turbine inlet cooling technologies have been installed at over 400 facilities, with about half in the U.S.[367] While the benefits are greatest in warm climates, these technologies have also been installed in more moderate climates. For instance, General Electric's SPRINT technology can improve turbine heat rates and increase output by as much as 17% on hot days, although more typical conditions showed a 9% increase in output.[368]

Another promising approach that is offered by various turbine manufactures and vendors involves upgrading gas turbine components. For instance, General Electric has developed improved brush seals for the compressor shaft that can increase output by about 1% and improve heat rate by about 0.5%. Replacing high pressure packing seals on the turbine with brush seals can also improve performance, typically 0.3% in output and 0.2% heat rate.[369] New turbine blade materials and designs that reduce the need for bleed air to cool the turbine blades can improve heat rate by about 20%. Comprehensive upgrades can yield power increases of 16 to 26% and heat rate improvements of 4.5 to 11%.[370]

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[364] *Id*.
[365] *Id*.
[366] Andover Technology Partners, Improving Heat Rate on Combined Cycle Power Plants (Dec. 2016), Attachment A.
[367] *Id*.
[368] *Id*.
[369] *Id*.
[370] *Id*.

In addition to improving the heat rate of the gas turbine, there are several approaches that can be used to improve the heat rate of the steam system. These include steam turbine upgrades, condenser cleaning, and rebuilding of feed pumps. Installing variable speed drives for pumps and fans can also improve heat rates by reducing parasitic load. There are also operating and maintenance practices can also help minimize losses in the steam system.

Comments by General Electric on the proposed CPP identified several technologies that cumulatively have the potential to decrease the $CO_2$ emission rate of an existing NGCC unit by approximately 4%, while also increasing output.[371] Case studies where upgrades have been applied also demonstrate that output from existing NGCC units can be increased by more than 5% while decreasing fuel use by 1% to 3%.[372]

*6. Coal Heat Rate Improvement.*

EPA's building block one estimate for heat rate improvements at coal-fired units in the final CPP does not reflect fully demonstrated potential and cannot be used alone to satisfy the BSER.

Opportunities to reduce a coal unit's emissions through on-site efficiency improvements are readily available and have been documented in numerous studies by Sargent and Lundy, NETL, Resources for the Future, and others. These analyses have demonstrated a potential to achieve efficiency improvements that significantly exceed EPA's conservative estimate of 2.1% to 4.3% (depending on the interconnection region) in the final CPP. For instance, one NETL assessment determined that a 10% improvement in fleet-wide efficiency is a reasonable average efficiency target based on a combination of aggressive refurbishment and improved operation maintenance.[373] NETL's consultations with industry experts validated this conclusion, identifying over 50 opportunities to improve thermal efficiency and finding that there is headroom for efficiency improvements among all plants including those that currently operate at below average, average, and above average efficiency levels.[374]

However, in light of the other emission reduction options identified in these comments (and the "rebound" risk described below), even a more aggressive assessment of heat rate improvement potential would be insufficient, standing alone, to constitute the BSER. In the final CPP, EPA determined that the "quantity of emission reductions achievable through heat rate improvement measures was insufficient for these measures alone to constitute the BSER."[375] Given that natural gas conversion can achieve a reduction in emission rates of approximately

[371] *See* CPP Reconsideration Denial: Appendix 3, at 11; *see also* Comments of The General Electric Company, Carbon Pollution Emission Guideline for Existing Stationary Sources: Electric Utility Generating Units (Dec. 1, 2014).
[372] *See* CPP Reconsideration Denial: Appendix 3 at 11; *see also* Major Upgrade of Oregon Power Plant Completed, Power Engineering (July 22, 2016), http://www.power-eng.com/articles/2016/07/major-upgrade-of-oregon-power-plant-completed.html?cmpid=enl-poe-weekly-july-26-2016&cmpid=enl_PE_Weekly_2016-07-26&eid=294698054&bid=1478248; Russell Ray, Making Old New Again (Mar. 22, 2016), http://www.power-eng.com/articles/print/volume-120/issue-3/features/making-old-new-again.html.
[373] EDF CPP Comments at 131-132.
[374] *Id.*
[375] CPP Final Rule at 64,745.

40%, and that CCS can achieve even higher rates of emission reduction, EPA must similarly reject heat rate improvements as the sole basis for the BSER even if it significantly increases its assessment of heat rate improvement potential.

In addition, if EPA evaluates heat rate improvements as a potential element of the BSER in a replacement for the CPP, it must consider the potential for such improvements to result in increased dispatch of steam generating units and associated increases in emissions. In fact, according to a 2015 study which assessed different scenarios for U.S. power plant carbon standards, coal heat rate improvements alone would increase coal-fired power plant generation and result in minimal national carbon pollution emission improvements and an increase in national $SO_2$ emissions compared to a reference case with no policy.[376] In the final CPP, EPA further determined that applying just heat rate improvements to high-emitting plants could lead those plants to increase operations at the expense of less-polluting plants, reducing the potential emission reductions from such measures.[377] A recent study by scientists at Syracuse and Harvard Universities also shows that, compared to doing nothing, replacing the CPP with a narrower option would make air quality worse and endanger more lives, on top of the 3,500 premature deaths and $33 billion in health costs already estimated.[378] According to the study, the deterioration in air quality under a heat-rate only approach would be caused by emissions rebound at coal-fired power plants.[379]

*7. Reductions in Utilization.*

If it moves forward with this rulemaking, the Agency must consider reductions in utilization from fossil fuel fired power plants as an available system of emission reduction, as it is adequately demonstrated, cost-effective, and fits within EPA's proposed interpretation. As discussed above, reduced utilization is the foundation of the CPP BSER and meets EPA's proposed statutory reinterpretation. As such, the proposed repeal of the CPP should be abandoned. If it is not, reduced utilization must nonetheless be a core focus of any subsequent BSER inquiry because it best satisfies the statutory requirements of securing emission reductions considering cost and impacts on energy, and reflects the actual operation of the power sector.

Reduced utilization plainly meets the Agency's cramped interpretation of its authority in the proposed repeal, which reads section 111(a)(1) "as being limited to emission reduction measures that can apply 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

[376] Charles T. Driscoll, Jonathan J. Buonocore, Jonathan I. Levy, Kathleen F. Lambert, Dallas Burtraw, Stephen B. Reid, Habibollah Fakhraei and Joel Schwartz, US Power Plant Carbon Standards and Clean Air and Health Co-Benefits (May 2015), http://harvardforest.fas.harvard.edu/sites/harvardforest.fas.harvard.edu/files/publications/pdfs/Driscoll_NatClimChange_2015.pdf.
[377] *Id.* (discussing potential "rebound" in pollution following heat rate improvements).
[378] 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/.
[379] *Id.*

source at another location."[380] Under this narrow interpretation, reductions in utilization by an individual source is plainly an "operational change" than an owner or operator can implement at an individual source, and is not a measure that "the source's owner or operator can implement on behalf of the source at another location."

Reduced utilization is clearly an adequately demonstrated system of emission reduction, as EPA has already used it in permitting for stationary sources under the CAA, and the Agency has previously found that reduced utilization is adequately demonstrated in the final CPP.[381] Indeed, permitting authorities have included such measures in sources' PSD permits for years.[382]

Additionally, reductions in utilization are a highly cost-effective means of reducing carbon emissions from coal-fired power plants, as EPA determined in the final CPP.[383] If combined with heat-rate improvements, reductions in utilization or utilization caps would have the added benefit of preventing a rebound effect.[384] Because reduced utilization meets all requirements of a permissible system of emission reduction and fulfills the statutory factors better than the alternatives, the Agency must consider it in any subsequent proposal.

### B. If EPA Permits Designated Sources to Comply Using Trading, Averaging, and Other Compliance Flexibilities, Those Flexibilities Must Be Reflected in the BSER Inquiry and Taken Into Account When Evaluating the Costs of the BSER.

As EDF intends to discuss in further detail in comments on EPA's proposed repeal of the CPP, EPA's proposed interpretation of the term "best system of emission reduction" arbitrarily fails to consider the implications that such an interpretation would have for the availability of averaging, trading, and other flexible compliance mechanisms under section 111(d). Numerous commenters on the CPP – including many entities that ultimately challenged the CPP in court – urged EPA to affirm that State plans submitted under section 111(d) can utilize emissions averaging or trading systems, noting that such compliance flexibilities enable cost-effective

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[380] 82 Fed. Reg. 48,039.

[381] CPP Final Rule at 64,782 n.602 (noting that "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").

[382] In 2010, the Wisconsin Department of Natural Resources issued a PSD permit to the Rockgen Energy Center that required each of the turbine processes to operate no more than 3,800 hours in any 12 consecutive months, while also limiting the number of hours that these turbines fired with distillate fuel. More recently, in 2014, EPA Region 6 issued a PSD permit for the Antelope Elk Energy Center that limited the turbine to 4,572 operational hours on a 12-month rolling basis in order to achieve a BACT standard of 1,304 lbs of $CO_2$/MWh. EPA does not question its prior finding in the ANPR, and therefore it must consider reduced generation as a system of emission reduction in its repeal. *See also supra* Section V.A (discussing how reductions in utilization have been incorporated into other EPA standards, how the method has been used successfully to reduce carbon emissions by States and companies, and how it reflects actual operation of the power sector).

[383] CPP Final Rule at 64,782.

[384] EPA solicits comment on how to combat the potential rebound effect in its ANPR. 82 Fed. Reg. at 61,514 ("The EPA solicits comments on this potential 'rebound effect,' on whether the EPA should consider it in a potential future rulemaking, and on any available measures that the Agency can take to minimize any potential effect."). Capping utilization would be one method to combat this rebound effect.

reductions in emissions and have been successfully utilized by power companies under other CAA programs.[385] Yet EPA's proposed interpretation would hold that the "best system of emission reduction" can only encompass measures "that apply at, to, and for a particular source" or constitute a "physical or operational change to a source."[386] EPA's view is that this proposed interpretation would rule out systems of emission reduction that encompass shifts in generation to cleaner sources.[387] If ultimately adopted, EPA's interpretation could rule out compliance through averaging and trading systems, which allow sources to meet emission standards by taking advantage of emission reductions that occur at other sources and that result from measures implemented by other entities. Indeed, this precise concern was discussed in detail by a power company that filed an *amicus* brief in defense of the CPP in the D.C. Circuit, in response to the petitioners' arguments – which are virtually identical to those in the CPP repeal proposal – that the "best system" cannot encompass shifting of generation away from highly-polluting power plants.[388]

If EPA nonetheless determines that averaging, trading, and similar flexibilities *can* be used for compliance under section 111(d), EDF believes that determination has two important consequences for the development of emission guidelines for carbon pollution from power plants. First, it would be logically inconsistent and arbitrary for EPA to recognize that such mechanisms are available for *compliance* while, at the same time, determining that they *cannot* be considered in determining the "best system" and establishing emission guidelines. If a source can lawfully meet a "standard of performance" by obtaining credits representing reduced emissions from *other* affected sources, there is no logical reason why such transactions – and the emission-reducing activities that those transactions represent – should not be considered as a potential "system of emission reduction" when crafting the emission guideline. Allowing trading and averaging for compliance, while ruling out such techniques in setting standards, would be like calculating a golfer's handicap assuming that she only has a putter in her bag, while allowing the golfer to play using the full bag of clubs. As EPA put it in its brief defending the CPP in the D.C. Circuit,

> Petitioners seek to have it both ways . . . . if states can properly craft standards designed to accommodate and encourage the use of generation-shifting as a suitable pollution-control strategy, then EPA can likewise reasonably interpret the phrase "system of emission reduction" to encompass the same suitable strategy. Section 111 does not dictate the provision of maximum flexibility for the purpose of achieving the most minimal emission limitation.[389]

Because allowing cross-source averaging and trading for compliance would logically require that such measures be considered in defining the "system of emission

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[385] CPP Final Rule at 64,733 n.380; CPP Legal Memorandum at 14-18.
[386] 82 Fed. Reg. at 48,037.
[387] As explained *supra*, EDF believes EPA's view is incorrect and that the current BSER reflected in the Clean Power Plan would, in fact, comport with EPA's proposed interpretation of section 111(a)(1).
[388] *See* Brief of *Amicus Curiae* Dominion Resources, Inc. in Support of Respondent, *West Virginia v. EPA,* No. 15-1363 at 15 (filed Apr. 1, 2016) ("[A]ny constraint on the scope of the term 'standard of performance'—such as limiting it to 'inside-the-fence' abatement measures and prohibiting trading and averaging among sources (including through the use of market-based credits)—would function as a direct constraint on state authority and, ultimately, on compliance flexibility for regulated power plants."), Attachment C.
[389] Respondent EPA's Final Brief, *West Virginia v. EPA,* No. 15-1363 at 48-49 (filed Apr. 22, 2016).

reduction," EPA would unavoidably have to consider the BSER reflected in the CPP if it were to determine that averaging and trading were permitted for compliance under section 111(d).

Second, to the extent EPA's emission guideline encourages or allows States to craft plans that incorporate averaging and trading programs, it would be arbitrary not to consider how such mechanisms would affect the costs of the BSER (even if the BSER consisted of physical modifications adopted at individual sources, such as co-firing or CCS). This is implicit in the text of section 111(a)(1), which requires that, in selecting the "best system" EPA take into account "the cost of achieving *such reduction*."[390] Where EPA expects that "such reduction" would be achieved primarily through the use of allowance trading or averaging of emission reduction credits rather than implementation of the BSER at each individual source, EPA should therefore take into account the *actual* cost of those "real-world" reduction strategies in determining the BSER. If EPA were to blind itself to those compliance mechanisms in assessing the costs of the BSER, it would arrive at an inaccurate (and almost certainly inflated) assessment of costs and establish standards that are far weaker than those that could be achieved in practice – contrary to section 111's manifest purpose of achieving "maximum feasible control" of harmful pollution.

This approach is consistent with the D.C. Circuit's recognition in *Sierra Club v. Costle* that "section 111 gives EPA authority when determining the best technological system to weigh cost, energy, and environmental impacts *in the broadest sense at the national and regional levels and over time* as opposed to simply at the plant level in the immediate present."[391] Indeed, in the 1979 NSPS for coal-fired electric generating units at issue in *Sierra Club*, EPA assessed the cost, energy, and environmental impacts of the flue gas desulfurization system it had selected as the BSER by using a national-scale econometric model of the power system. As the court explained, this model took into account changes in new plant construction and utilization that would result from the adoption of the particular standard of performance based on that BSER – to wit, the model took into account how the power system would *actually* respond to the promulgated NSPS.[392] EPA's finding, based on this modeling, that "uniform control is expected to result in greater reliance on old plants and less utilization of new plants than will variable control" was a key factor underlying its selection of the BSER. The court upheld this approach, finding that "to exercise [its] discretion [under section 111] EPA *must* examine the effects of technology on the grand scale in order to decide which level of control is best."[393]

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[390] 42 U.S.C. § 7411(a)(1).
[391] *Sierra Club*, 657 F.2d at 330 (emphasis added).
[392] *Sierra Club*, 657 F.2d at 335-36 ("Under the cost minimization model the higher the costs of pollution controls required by the NSPS, the more utilities will delay the retirement of older plants which do not have to comply with the NSPS, and the more utilities will be discouraged from building and operating new plants which must meet the NSPS. Since uniform control is costlier than variable control, uniform control is expected to result in greater reliance on old plants and less utilization of new plants than will variable control, which in turn leads to higher emissions.").
[393] *Id.* at 330 (emphasis added).

## VII. SECTION 111 UNAMBIGUOUSLY ASSIGNS A CENTRAL ROLE TO EPA IN SETTING EMISSION GUIDELINES, WHICH INCLUDES SETTING BINDING EMISSION LIMITS ON FACILITIES.[394]

In the ANPR, EPA broadly solicits comment on the "extent of involvement and roles of EPA in developing emissions guidelines."[395] EPA then repeatedly suggests that its role under 111(d) may be limited to "establishing procedures"[396] for States to submit plans, and that the Agency possesses discretion to promulgate guidelines that do not include binding emission limits.[397] This reading of section 111(d) flouts the plain text of Section 111, the 1975 Subpart B regulations implementing section 111(d), as well as the Agency's "longstanding view that its review of [State] plans under section 111(d) is substantive."[398]

Despite EPA's suggestion to the contrary in the ANPR, section 111(d) plainly contemplates a "substantive" role for EPA in determining the stringency of state plans. Under this framework, the Agency determines the BSER for a given source category and specific pollutant, along with the concomitant degree of emission limitation achievable through the application of that system.[399] Following this initial determination, EPA may then approve a State plan as "satisfactory" *only if* it achieves the requisite degree of emission reductions, and otherwise complies with the requirements of the CAA.[400] A final rule that permits States to achieve anything less than maximum feasible control under section 111(d) would be inappropriate and unlawful, especially in this context, where the Agency is under an obligation to take meaningful action to address climate change.[401]

### A. Section 111 Plainly Contemplates a Central Role for EPA in Determining the Stringency of Emission Guidelines for Existing Sources.

While the ANPR suggests that EPA's role under Section 111(d) is merely procedural or ministerial,[402] the plain text of section 111 precludes such a reading of the statute. Section 111(a)(1) plainly provides that it is the *Administrator*, not States, who determines the BSER and corresponding degree of achievable emission reduction:

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[394] This section responds to questions 1 and 3(b) from the ANPR. *See* 82 Fed. Reg. at 61,511.
[395] 82 Fed. Reg. 61,507, 61,510 (Dec. 18, 2017).
[396] *Id.* at 61,509 ("As the plain language of the statute provides, the EPA's authorized role under section 111(d)(1) is to develop a procedure for States to establish standards of performance for existing sources.").
[397] *Id.* at 61,511 ("The EPA also solicits comment on an approach where the EPA determines what systems may constitute BSER without defining presumptive emission limits and then allows the States to set unit-by-unit or broader emission standards based on the BSER while considering the unique circumstances of the State and the EGU.").
[398] CPP Legal Memorandum, at 22.
[399] *See* 42 U.S.C. § 7411 (a)(1).
[400] EPA has previously determined that the statute unambiguously requires EPA to disapprove State plans if they do not achieve the adequate amount of emissions reduction that EPA sets in its guidelines. Conversely, EPA must approve a State plan so long as it meets all applicable requirements of the Act. CPP Legal Memorandum at 22-28 ("Thus, based on the dictionary meaning of 'satisfactory' and the structure of the Act, Congress has spoken directly to the issue. 'Satisfactory' means 'meet all applicable requirements of the Act.'").
[401] See *supra* Section II.A.
[402] 82 Fed. Reg. at 61,511 ("The EPA's authorized role under CAA section 111(d) is to establish a procedure under which States submit plans establishing standards of performance for existing sources.").

> The term "standard of performance" means 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 non-air quality health and environmental impact and energy requirements) the *Administrator determines has been adequately demonstrated*.[403]

This definition confirms that EPA determines the BSER through consideration of the relevant factors, and that this diagnosis *includes* a prescription of "the degree of emission limitation achievable" under the system. Notably, this provision explicitly applies to both new and existing sources.[404] And the D.C. Circuit has determined that the BSER analysis by necessity encompasses an assessment of how stringently to apply the BSER.[405] Therefore, EPA cannot lawfully determine the BSER under section 111(d) without prescribing emission limits for State plans.

Further evidence that EPA is to play a central, substantive role in discharging its obligation under this section is found in EPA's authority to determine whether State plans are "satisfactory" under section 111(d)(2). Section 111(d)(2) provides the Administrator with explicit authority to determine whether State plans are "satisfactory":

> (2) The Administrator shall have the same authority—
>
> > (A) to prescribe a plan for a State in cases where the State fails to submit a satisfactory plan as he would have under section 110(c) [42 U.S.C. § 7410(c)] in the case of failure to submit an implementation plan, and
> >
> > (B) to enforce the provisions of such plan in cases where the State fails to enforce them as he would have under sections 113 and 114 [42 U.S.C. §§ 7413 and 7414] with respect to an implementation plan.[406]

EPA has consistently interpreted this provision to mean that "some substantive criterion" must be available to facilitate the Administrator's review of State plans.[407] Significantly, Section 111(d)(2) contains an explicit cross-reference to 110(c), which contains the statutory description of the process for approving State plans under a different CAA program.[408] Because section 111(d)(2) provides EPA with the "same" authority as the Administrator has under section 110(c),

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[403] 42 U.S.C. § 7411(a)(1) (emphasis added).
[404] *Id.* § 7411(a) ("For purposes of this section . . .").
[405] *Sierra Club*, 657 F.2d at 326.
[406] 42 U.S.C. § 7411(d)(2).
[407] 40 Fed. Reg. 53,340, 53,342 (Nov. 17, 1975).
[408] When Congress added section 111(d)(2) to the CAA, section 110(c) read:

> The Administrator shall, after consideration of any State hearing record, promptly prepare and publish proposed regulations setting forth an implementation plan, or portion thereof, for a State if—(1) the State fails to submit an implementation plan for any national ambient air quality primary or secondary standard within the time prescribed, (2) the plan, or any portion thereof, submitted for such State is determined by the Administrator not to be in accordance with the requirements of this section, or (3) the State fails, within 60 days after notification by the Administrator or such longer period as he may prescribe, to revise an implementation plan as required pursuant to a provision of its plan referred to in subsection (a)(2)(H).

Clean Air Amendments of 1970, Pub. L. 91-604, § 4, 84 Stat. 1682 (1970).

the most sensible interpretation of section 111(d) is that the Administrator should have authority to engage in substantive review of State plans – just as the Administrator reviews State implementation plans under section 110 to ensure they will be sufficient to attain the National Ambient Air Quality Standards.

This means a "satisfactory" plan under this section is one that complies with all applicable portions of the CAA – including the degree of emissions limitation achievable through the application of the BSER.[409] Indeed, EPA has previously interpreted 111(d)(2) as requiring EPA to ensure that State plans achieve *at least* the amount of emission reduction achievable through the application of the BSER.[410]

An interpretation where EPA only approves State plans based on procedural criteria unrelated to emission reductions would also run counter to the structure of the CAA, where EPA typically sets a *floor* for pollution standards that States must meet, but States remain free to go above these standards. Congress included this structure in several provisions of the CAA, including the NAAQS program that is explicitly cross-referenced in section 111(d).[411]

Congressional understanding during the 1977 CAA Amendments reinforces this understanding of EPA's role under section 111(d). During that amendment process, Congress added the RUL provision to the text of section 111(d).[412] If Congress understood EPA to be limited to approving State plans based solely on procedural criteria, the RUL language would be unnecessary. In addition to being inconsistent with congressional understanding during the 1977 CAA Amendments, exclusive State authority over existing source standards would be contrary to the purpose of the 1970 CAA Amendments "to provide for a more effective program to improve the quality of the nation's air."[413]

When promulgating the implementing regulations for this section in 1975, EPA explicitly *rejected* an approach where the Agency would limit its role in approving State plans under 111(d) to merely considering procedural criteria:

> [I]t 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 of the Act requiring

[409] *See supra* n.398.
[410] *See* CPP Legal Memorandum at 22 ("[T]o ensure that the plans are 'satisfactory' under section 111(d)(2), EPA must be assured that the plans would achieve at least the amount of emission limitation that the application of the BSER would achieve."); *id.* at 28 ("[T]he term 'satisfactory plan' should be interpreted to mean a plan that meets all applicable requirements of the Act, including but not limited to section 111(d), subpart B, and these emission guidelines.").
[411] 42 U.S.C. § 7410; 42 U.S.C. § 7416.
[412] 42 U.S.C. § 7411 ("In promulgating a standard of performance under a plan prescribed under this paragraph, the Administrator shall take into consideration, among other factors, remaining useful lives of the sources in the category of sources to which such standard applies.").
[413] Clean Air Amendments of 1970, Pub. L. No. 91-604, 83 Stat. 1676, 1676.

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.[414]

This reading is reinforced by the fact that Section 111(d) *requires* the Agency to take meaningful action to address the urgent problem of climate change,[415] and requires EPA to consider the amount of pollution reduction any guideline would achieve.[416]

In the ANPR, EPA asks whether revisions to the implementing regulations would be appropriate in this context.[417] As discussed here, the 1975 regulations properly reflect EPA's substantive role in ensuring that state plans meet the requirements of the statute. Any revisions to these implementation regulations that depart from that statutorily required, time-tested role would be unlawful and unreasonable.

### B. EPA Must Set Binding Emission Limits on Facilities.

Similarly, EPA cannot plausibly claim that it possesses the discretion to set emission guidelines without binding, presumptive emission limits, as it suggests in the ANPR.[418] A central aspect of EPA's role under section 111(d) is determining "the degree of emission limitation achievable" through the application of the BSER. A non-binding emission guideline for this source category and pollutant would be contrary to the structure of section 111(d) as described above, the statutory purpose and structure of the CAA as a whole, and EPA's reasonable interpretation of its authority embodied in its 1975 regulations interpreting section 111(d). Failing to prescribe presumptive emission limits would also have a number of adverse practical effects: it would place a substantially greater implementation burden on the States, would exacerbate regulatory uncertainty for the industry by leading to inconsistent and unpredictable State plans, and would create the very "race to the bottom" and competitive distortions among the States that the CAA was designed to avoid.[419]

As mentioned above, any section 111(d) guideline that permitted States to allow emissions exceeding the federally prescribed emission limit would conflict with the plain text of section 111. Under section 111(d)(1)(A), States must establish "standards of performance" for existing sources. The definition for "standard of performance" under this section provides those standards shall reflect "the degree of emission limitation achievable" through application of the BSER. An EPA emission guideline document that did not include emission limits would contradict the plain text of section 111(a)(1), which provides that the Administrator *shall* determine "the degree of emission limitation achievable." If a State plan failed to secure the

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[414] 40 Fed. Reg. at 53,343.
[415] *See supra* Section II.
[416] *See supra* Section IV.
[417] 82 Fed. Reg. at 61,511 ("The EPA also solicits comment on whether any other changes to the implementing regulations are appropriate.").
[418] *Id.*
[419] Indeed, in *Sierra Club v. Costle*, the D.C. Circuit and all parties challenging the rule agreed that one of the requirements in section 111 was "[t]he standards must not give a competitive advantage to one State over another in attracting industry." 657 F.2d at 325. *See also Alaska Dep't of Envt'l Conservation v. EPA*, 540 U.S. 461, 486 (2004) (EPA's federal supervisory authority helps guard states against the threat of pollution from more permissive neighboring states); H.R. Rep. No. 91-1146, at 3 (June 3, 1970) (noting that one of the purposes of the CAA was to guard against a "race to the bottom" where States "compete with each other in trying to attract new plants and facilities without assuring adequate control" of pollutant emissions).

"degree of emission reduction achievable," then it similarly would fall outside of the statutory definition of standard of performance, and therefore would not meet the requirement that the State "establish[] standards of performance for existing sources."[420] EPA cannot subsequently approve a State plan that fails to set emissions limitations as "satisfactory," as it would contradict the language of section 111, and fail to meet the prerequisite that a satisfactory plan meet all applicable requirements of the CAA.[421]

In addition to violating the statutory definition of "standard of performance," a process under 111(d) where EPA could determine that a plan is "satisfactory" without defining in advance what standards of performance reflect the degree of emission reduction achievable through the BSER would be arbitrary.

The cross-reference to section 110, where EPA prescribes NAAQS that States then implement, is strong indication that Congress expected EPA to provide real guidance and set baseline expectations of stringency for the States. While courts have never had occasion to consider EPA's role in approving State plans under section 111, analogies may be drawn from interpretations of EPA's authority to oversee State plans under the NAAQS program. Courts have consistently rejected an approach where EPA is limited to a ministerial approval of State Plans under the CAA.[422]

EPA's implementing regulations from 1975 underscore the implausibility of a 111(d) rule where EPA defines the BSER "without defining presumptive emission standards."[423] During the 1975 rulemaking, EPA received several comments questioning the Agency's authority to set substantive guidelines.[424] EPA correctly rejected these comments and demonstrated that it possessed the authority to set binding guidelines.[425] Additionally, the Agency's regulations provide that EPA-promulgated guidelines shall include "[i]nformation on the degree of emission reduction which is achievable with each system,"[426] and separately requires EPA to provide "[a] description of systems of emission reduction which, in the judgment of the Administrator, have been adequately demonstrated."[427] This shows that EPA correctly viewed that the Agency *must* determine both the BSER, and the degree of emission limitation achievable under the application of that system.

EPA now claims that it has "discretion" to make the emissions guidelines non-binding, and points to two provisions of the subpart B regulations to justify its authority.[428] But the regulations EPA cites contradict EPA's claim. Section 60.24(c) of title 40 of the C.F.R. provides that "emission standards shall be no less stringent than the corresponding emission guidelines," which plainly assumes that the emission guidelines will provide some form of stringency, i.e., an

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[420] 42 U.S.C. § 7411(d)(1).
[421] See *supra* footnote 398.
[422] *See, e.g., North Dakota v. EPA*, 730 F.3d, 750, 760-61 (8th Cir. 2013) (holding that EPA is charged with "more than the ministerial task of routinely approving SIP submissions" under CAA § 169A); *Alaska Dep't of Envtl. Conservation v. EPA*, 540 U.S. 461 (2004); *Oklahoma v. EPA*, 723 F.3d 1201 (10th Cir. 2013).
[423] 82 Fed. Reg. at 61,511.
[424] 40 Fed. Reg. 53,342.
[425] *Id.*
[426] 40 C.F.R. § 60.22(b)(3).
[427] *Id.* § 60.22(b)(2).
[428] 82 Fed. Reg. at 61,509 ("That is to say, in those circumstances where the Agency, in an exercise of discretion, chooses to make its emission guideline binding . . .").

emission limit. EPA therefore cannot invoke section 60.24(d) of the implementing regulations to argue that it has authority to make the regulations non-binding, because the Agency has already made the determination that greenhouse gases, including carbon dioxide emissions, threaten the public health and welfare.[429]

Indeed, EPA has emphasized the unusual gravity and urgency of the climate change threat and the need to move quickly to reduce greenhouse gas emissions. EPA designed the CPP, including its implementation schedule, in light of what it found to be an "urgent need for actions to reduce GHG emissions."[430] In 2015, the Agency repeatedly expressed the urgency of emissions reductions, noting that the time-sensitive nature of this need was supported by new scientific assessments since 2009 that confirmed and strengthened the need to act quickly,[431] and that it is consistent with the purposes of the CAA to protect against such urgent and severe threats to public health and welfare. The Agency subsequently reaffirmed these findings in the Denial of Petitions for Reconsideration of the CPP.[432] EPA does not question these prior findings in the ANPR,[433] and notes that it will not reopen consideration of the endangerment finding in the subsequent rulemaking. In light of this record, EPA cannot plausibly claim that somehow greenhouse gas emissions from stationary sources do not also contribute to the threat to public health and welfare identified in the endangerment finding.

Failing to prescribe a binding, presumptive emission limit as part of an emission guideline would not only be contrary to the statute and EPA's long history of administrative precedent under section 111(d) – it would also pose important practical problems for States, power companies, and the public. By providing no guidance to states as to what level of emission reduction EPA deems achievable under the BSER, such an emission guideline would place a significant new administrative and analytical burden on the states and leave the states with complete uncertainty as to whether their plans will be "satisfactory" to EPA. It would, further, encourage states to "game" the process by submitting weak plans to EPA – creating the very "race to the bottom" in emission standards that the CAA was enacted to prevent, and increasing the likelihood of market distortions and inconsistencies across states in a sector whose day-to-day operations are highly integrated and interconnected. And it would increase uncertainty for power companies by making it impossible to predict the stringency of a state plan in advance – or to assess whether a particular state plan, once established, will be "satisfactory" to EPA. All of these impacts would not only work to the detriment of states and power companies, they would also harm the public interest in pollution reduction and increase costs to ratepayers.

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[429] EPA, Endangerment and Cause or Contribution Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496 (Dec. 15, 2009) (". . . the greenhouse gas air pollution that endangers public health and welfare under CAA section 202(a)"), *upheld at Coalition for Responsible Regulation Inc. v. EPA*, 684 F.3d 102 (D.C. Cir. 2012).

[430] CPP Final Rule at 64,937.

[431] *Id*. at 64,675, 64,677, 64,684, 64,686.

[432] CPP Reconsideration Denial at 21 ("The science regarding the impacts of climate change has continued to advance since publication of the Clean Power Plan.").

[433] 82 Fed. Reg. at 61,509 ("Nothing in this ANPRM should be construed as addressing or modifying the prior findings made under titles I and II of the CAA discussed in the preceding paragraphs with respect to endangerment and the requirements under 111.").

### C. Section 111(d) and Subpart B Regulations Do Not Allow States to Depart from EPA's Emission Guidelines in a Way that Would Undermine Their Health and Environmental Benefits.

Assuming that EPA correctly determines it must set binding emission limitations under 111(d), it cannot subsequently achieve the same effect of a non-binding emission guideline by allowing States to inappropriately invoke the RUL provision or 60.24(f) variance. Both provisions were designed to accommodate a narrow set of situations where an existing facility would be forced to install expensive retrofit technology. The RUL provision and variance provision under the Subpart B regulations do not alter the basic structure of section 111, where EPA must determine the BSER and set binding emission guidelines that reflect the "degree of emission limitation achievable."

#### *1. Section 111(d)'s Remaining Useful Life Provision Does Not Alter EPA's Obligations.*

The RUL provision simply requires that States be allowed to *consider* RUL in developing their State plans. It does not dictate *how* RUL should be considered. Much less does it diminish EPA's role in ensuring that standards meet section 111 requirements, including achieving maximum feasible control of regulated pollution. The text of the RUL provision, which reads that States shall be permitted to consider RUL "among other factors," supports this reading.[434]

It is also clear that Congress did not intend for the RUL provision to serve as a broad mechanism for exempting existing sources or undermining section 111(d) standards. Congress designed the RUL provision to apply to a narrow set of situations where facilities near retirement could be required to make extensive capital investments on expensive retrofit technology. For example, during the 1977 CAA Amendments, Congress required that new sources install actual controls to reduce emissions, in order to reduce reliance of those sources on cleaner fuels. This freed up those fuels, in turn, for existing sources to use to reduce their level of emissions.[435] In allowing existing sources to reduce their emissions by purchasing cleaner fuels, Congress recognized that sources with "relatively short remaining useful lives" could stay in operation instead of shutting down while still achieving emission reductions.[436]

Additionally, when Congress amended the CAA in 1977, it also added a RUL provision to the regional haze program of the CAA.[437] The legislative history surrounding these amendments show Congress was particularly concerned about costs imposed on plants built before 1962,[438] and Congress ultimately provided an *explicit* exemption for plants that were built before 1962.[439] This shows that Congress viewed the RUL provision, which it also adopted in the

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[434] 42 U.S.C. § 7411(d)(1) ("Regulations of the Administrator under this paragraph shall permit the State in applying a standard of performance to any particular source under a plan submitted under this paragraph to take into consideration, among other factors, the remaining useful life of the existing source to which such standard applies.").
[435] H. Rep. 95-294 at 185, 1977 CAA Leg. Hist. at 2652.
[436] H. Rep. 95-294 at 186, 1977 CAA Leg. Hist. at 2653.
[437] CPP Legal Memorandum at 36.
[438] H. Rep.to accompany H.R. 6161, 1977 CAA Leg. Hist.at 2480; see also H.R. 6161, § 116, 1977 CAA Leg. Hist.at 3237.
[439] CPP Legal Memorandum at 36.

169A context, was something *other than* an exemption.[440] Where Congress intended to provide an exemption for existing sources, it did so explicitly.

As discussed in detail above, if EPA promulgates a rule that allows flexible options to reduce emissions for compliance purposes, but excludes those very same options from the standard setting, it would be arbitrary. Assuming that EPA does adopt some form of compliance flexibility in the final rule, such as crediting or trading, that kind of emission guideline would plainly satisfy the RUL provision without any additional features. Under such an approach, facilities would not be forced to install any retrofit technology at all, and could instead comply by purchasing credits. Indeed, it would be arbitrary and unlawful for EPA to approve departures from a federal emission guideline based on RUL where compliance flexibilities are available that would obviate the need for an adjustment based on RUL. Not surprisingly, during two previous rulemakings under two Administrations of different parties, EPA determined that such an approach would satisfy the RUL provision.[441]

If EPA does not allow for compliance flexibilities in a replacement rule, EPA should carefully limit the invocation of the RUL provision in State plans consistent with its mandate to ensure that all plans establish "standards of performance" that reflect the degree of emission reduction "achievable" through the BSER. One precedent for such guidance is the mechanism EPA has adopted to weigh RUL in the regional haze program.[442] In EPA's guidance on best available retrofit technology ("BART") determinations, RUL is merely "one element of the overall cost analysis."[443] A facility's age only affects the BART determination where the amortization period is longer than its RUL. Moreover, the claimed RUL must be guaranteed through federal- or state-enforceable restrictions.[444] A State may allow a facility to continue operating beyond this date, but only if full BART (i.e., not taking into account RUL) is installed within five years of the date EPA approves the State implementation plan.[445] Thus, owners cannot circumvent the BART requirement by providing an inaccurately short estimate of RUL. EPA, if it decides to let facilities depart from the BSER, *must* provide for a similar set of limitations on the use of the RUL provision, to ensure that it is not used to undermine health and environmental benefits. Moreover, given the wealth of opportunities available to achieve emission reductions from existing power plants, EPA must require that states evaluate options for "making up" any reductions that are foregone as the result of application of a RUL provision.

*2. EPA Cannot Lawfully Allow States to Invoke the Subpart B Variance Regulations To Achieve Less Protective State Plans.*

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[440] H. Rep. to accompany H.R. 6161, 1977 CAA Leg. Hist.at 2480; *see also* H.R. 6161, § 116, 1977 CAA Leg. Hist.at 3237.

[441] 70 Fed. Reg. 28,606 at 28,616-17 (finding that a cap-and-trade program would meet all relevant factors of section 111, including the RUL provision); CPP Final Rule at 64,734-35 ("Trading also supports the EPA's approach to the 'remaining useful life' provision in section 111(d)(1) because with trading, an affected EGU with a limited remaining useful life can avoid the need to implement long-term emission reduction measures and can instead purchase ERCs or other tradable instruments, such as mass-based allowances, thereby allowing the state to meet the requirements of this rule.").

[442] Regional Haze Regulations and Guidelines for Best Available Retrofit Technology (BART) Determinations; Final Rule, 70 Fed. Reg. 39,104, (July 6, 2005).

[443] 40 C.F.R. Appendix Y to Part 51, at 39,193-70.

[444] *Id.*

[445] *Id.*

Nor can EPA allow for limitless State departure from the emission guideline by invoking the variance provision contained within the Subpart B regulations. Again, the Agency is under a statutory obligation to achieve meaningful reductions of carbon pollution from the power sector. EPA cannot invoke this variance provision to establish standards that do not reflect the degree of emissions limitations achievable through the application of the BSER. Indeed, EPA does not have to allow for variances at all under this provision,[446] and it could simply decide to prohibit States to depart from the emission limitation set in its emission guideline, as EPA did when promulgating the CPP. If the Agency chooses to allow variances for its emission guideline here, it must provide a reasoned explanation for that action, taking into account that the Agency is under an obligation to achieve meaningful reductions, and acknowledging that EPA has previously determined not to invoke this variance for the same pollutant and source.

Even if EPA does allow for variances under this provision, the Subpart B regulations cannot override the statutory language, which plainly requires States to establish "standards of performance" that reflect the degree of emission limitation "achievable" through the BSER. Similar to our analysis of the RUL provision above, that mandate means that any variances should be carefully limited. For example, if EPA allows for compliance flexibilities for affected units here, that scheme would obviate the need for factors 1 and 2 of section 60.24(f).[447] Facilities can use trading and other compliance mechanisms to avoid significant investments and compliance flexibilities can help facilities that would not otherwise be able to physically install emission limiting technology to comply with the emission guideline.

If compliance flexibilities are not permitted under a replacement rule, EPA must impose deadlines after which facilities must either implement the BSER or retire – consistent with the approach EPA has adopted under the regional haze program. EPA must also provide States with concrete guidance so they can decide which facilities may be eligible for a variance under this provision. And EPA must require that states evaluate opportunities to "make up" lost emission reductions resulting from invocation of the variance provision.

## VIII. RESPONSES TO MISCELLANEOUS REQUESTS FOR COMMENT.[448]

EPA requests comment on several additional miscellaneous issues in the ANPR including (1) Deadlines for submission and approval of State Plans,[449] and (2) The interaction of any replacement rule with the NSR Program under the CAA.[450]

### A. The Timeline for Submission and Approval of State Plans Should Be No Longer than the CPP's Timeline.

[446] 40 C.F.R. § 60.24(f) ("Unless otherwise specified in the applicable subpart on a case-by-case basis for particular designated facilities or classes of facilities. . .").
[447] *See* 40 C.F.R. § 60.24(f)(1)-(2).
[448] This section responds to questions 1, 1(a), and 4 from the ANPR. *See* 82 Fed. Reg. at 61,511.
[449] 82 Fed. Reg. at 61,511.
[450] 82 Fed. Reg. at 61,519.

The timeline for submission and approval of State plans under a replacement should reflect the need to act expeditiously given the pressing nature of climate change and should be no longer than the timeline set out in the CPP, if not substantially shorter. The CPP timeframe, which was designed by EPA in response to State input, allowed States more than adequate time to create and submit their plans.

EPA's default implementing regulations provide for State plans to be submitted nine months after EPA publishes final guidelines, unless otherwise stated. [451] Under the CPP, States were granted additional time to prepare: States had one year to submit State plans from publication of the final rule and had the option of obtaining a two-year extension to submit plans by September 6, 2018, three years after the final rule was published.[452] This timeline was designed to accommodate comments from States about the amount of time they required to formulate and submit plans.[453] EPA took these comments into consideration and extended its proposed timeline, which initially required State plans to be submitted 13 months after the final rule was published and, for States submitting individual, as opposed to multi-state, plans, allowed only a one-year extension of this deadline.[454] Accordingly, this timeframe already reflects a generous amount of time for State preparation and is significantly longer than the default timeframe or even the proposed timeframe.

Because States have considerable expertise in submitting state plans under various CAA programs and have already been on notice for a section 111(d) rule regulating carbon emissions from the power sector, the timeline for State plan submission in a replacement should conform to or move faster than the CPP's proposed timeline. EPA noted in the CPP that "states have already begun taking [steps] towards plan development" and States have "extensive experience with similar state plan submission deadlines under CAA section 110 SIPs." As described below, the deadlines EPA provided for State plan submission were generous in light of these factors. Because States have had even more time and notice to prepare for a section 111(d) rulemaking since the CPP was finalized, and because there is a need to move forward urgently with implementation of carbon pollution limits for power plants, it would be appropriate for EPA to adopt a shorter timeline in a replacement rule.[455] Further, the CPP timeline reflected the fact that EPA had provided States with a range of options for designing compliance frameworks, and that the choice and design of those frameworks might take some time. A standard with fewer implementation flexibilities, such as one that simply required States to incorporate emission standards into source permitting requirements, should require less time for State plan design. The overriding concern in implementing the Act must be securing reductions of harmful pollutants as rapidly as possible.

1. *States Have Experience and Expertise with Similar Timelines Under Other Clean Air Act Programs.*

[451] 40 C.F.R. § 60.23(a)(1).
[452] CPP Final Rule at 64,662, 64,855.
[453] *Id.* at 64,855.
[454] *Id*.
[455] *Id*.

State employees responsible for implementing the CPP have said the expertise they have developed from experience implementing clean air programs meant that they were well prepared to submit State plans in compliance with the CPP's generous timeline. For example, David Thornton, Assistant Commissioner for Air Policy at the Minnesota Pollution Control Agency, concluded that the CPP's timeline was "sufficient to allow for effective energy planning," and noted that: "[The CPP's] planning window is comparable to that provided by the CAA for many SIPs that address National Ambient Air Quality Standards (NAAQS). Some of these SIPs can require extensive levels of control across a far broader range of sources than the electric power sector, as well as significant amounts of modeling and other technical support."[456]

States have a history of successfully complying with similar timelines under other CAA programs. [457] For example, "section 111(d) planning. . . is very similar to the planning processes states regularly undertake under Section 110 of the CAA to meet federal ambient air quality standards for criteria pollutants."[458] Other rules regulating emissions from the power sector with shorter or comparable timelines include EPA's $NO_x$ SIP Call,[459] EPA's Regional Haze Program,[460] and EPA's Clean Air Interstate Rule.[461] As noted above, many State employees have themselves emphasized that experience with Section 110 and Section 111(d) plans, in addition to other clean air rules, will allow them to act swiftly in response to a new 111(d) rule.[462]

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[456] Joint Addendum: Exhibits in Support of Movant Respondent-Intervenors' Responses. in Oppositionn to Motions for Stay at A153-A154, *West Virginia v. EPA*, No 15-1363 (D.C. Cir.), ECF No. 1587530 (declaration of David Thornton, Minnesota Pollution Control Agency) [Hereinafter "Joint Addendum"].

[457] *Id.* ("[T]he planning window is comparable to other CAA state planning programs.").

[458] *Id.* at A16-A18 (declaration of Edith Chang, California Air Resources Board).

[459] 63 Fed. Reg. 57,356 (Oct. 27, 1998). This rule implemented a cap and trade program to reduce emissions of $NO_x$ from power plants and other large combustion sources and required state plans be submitted 12 months from signature of the notice on the final NOx SIP Call.

[460] 64 Fed. Reg. 35,714 (July 1, 1991). This rule requires states to submit SIPs one year from EPA's designation for areas designated attainment or unclassifiable for $PM_{2.5}$ and three years from EPA's designation for areas designated nonattainment for $PM_{2.5}$.

[461] 70 Fed. Reg. 25,162 (Mar. 20, 2005). This rule, regulating soot and smog from power plants, required SIPs be submitted 18 months after the final rule was signed.

[462] Joint Addendum at A40-A41 (declaration of Stuart Clark, Washington State Department of Ecology) ("Washington has developed previous CAA implementation plans in significantly less time than the three-plus years the CPP allots for states to develop compliance plans."); *id.* at A75-A77 (declaration of Robert Klee, Connecticut Department of Energy and Environmental Protection) (Connecticut has experience with SIP submissions for NAAQs, regional haze plans, reasonably available control measures under Ozone NAAQs, transformation of the state's vapor recovery program, 2014 RACT submission, Regional Haze 5-year Progress Report, submitted in just five months, NOx SIP, promulgated in just 12 months, which demonstrates Connecticut "has the capacity to develop plans that require multi-year complex planning, coordination with EPA and regulatory, and legislative changes in a relatively short period of time" and the "timeframes for the Clean Power Plan are adequate."); *id.* at A96-A97 (declaration of Douglas L. McVay, Rhode Island Department of Environmental Management) ("Rhode Island has decades of experience complying with other federal Clean Air Act rules that require comprehensive state planning to achieve compliance, including state implementation plans to achieve the National Ambient Air Quality standards for criteria air pollutants," and "RGGI states, including Rhode Island, are well equipped and will be able to comply with state planning requirements of the Clean Power Plan in a timely fashion."); *id.* at A107-A108 (declaration of Dick Pedersen, Oregon Department of Environmental Quality) (explaining CPP's compliance plan is similar to planning process for other Clean Air Act requirements including Section 110 SIP submission under Section 110, and Oregon has expertise from formulating three specific area plans to achieve national emissions standards for particulate matter and ozone within EPA deadlines"); *id.* at A120-A127 (declaration of Jared Snyder**,** New York State Department of Environmental Conservation) (discussing New York's expertise from implementing energy sector regulations, participating in RGGI, and developing NAAQs SIPs allows New York to comply with CPP timelines);

Edith Chang, Deputy Executive Officer of the California Air Resources Board ("ARB") also agreed that, "[p]lan submission and implementation timelines under the Clean Power Plan . . . afford states more than ample time."[463] Ms. Chang highlighted that:

> ARB has implemented many highly complex state programs that are more sweeping than the Clean Power Plan in significantly less time. . . . California's experience is not unique in this regard. In my view, the decades of experience which states have accrued in successfully developing and implementing Clean Air Act compliance plans, the wide array of possible plan designs, and the extended implementation and compliance timelines of the Clean Power Plan all render compliance planning entirely manageable for the Air Resources Board, as well as for other states that wish to submit their own plans. Experience with the Clean Air Act to date strongly suggests that state plans of this sort will be effective and can be implemented smoothly, just as has generally been true for pollution control planning under the Act.[464]

*2. States Had Already Taken Steps to Comply with the CPP, Allowing for Shorter Timelines.*

Many States had already begun to move forward on the CPP, and these efforts will likely be useful in allowing them develop State plans on a shorter timeline than otherwise. EPA found during the CPP rulemaking that States would be able to "hit the ground running," once the final rule was published, since States were "having conversations about how programs may be structured, who may oversee those programs, and what agencies and logistics will be involved."[465] In confirmation of this finding, in affidavits submitted to the D.C. Circuit just six weeks after the CPP was published, State officials described extensive efforts that they had undertaken or were undertaking to advance implementation. For example, Washington State Department of Ecology held stakeholder meetings and listening sessions and convened a technical meeting to discuss how the rule would impact the Northwest's power generation system.[466] States participating in the Regional Greenhouse Gas Initiative ("RGGI") began RGGI-wide stakeholder meetings and engaged discussions about CPP compliance in coordination with

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Joint Addendum at A142 (declaration of Martin Suuberg, Massachusetts Department of Environmental Protection) (discussing Massachusetts's "decades" of experience complying with Clean Air Act rules and preparation of SIPs for NAAQS and other 111(d) programs will allow compliance with CPP); *id.* at A155-156 (declaration of J. David Thornton, Minnesota Pollution Control Agency) (discussing Minnesota's experience with SIPs for NAAQS, regional haze, and other Section 111(d) requirements support their "ability to effectively plan for and comply with [the CPP]").

[463] *Id.* at A16 (declaration of Edith Chang, California Air Resources Board).

[464] *Id.* at A16-A18 (declaration of Edith Chang, California Air Resources Board).

[465] EPA's Responses to Public Comments on the EPA's Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, Chapter 6 at 15 (Aug. 2015).

[466] Joint Addendum at A35-A36 (declaration of Stuart Clark, Washington State Department of Ecology).

RGGI.[467] Other States took similar steps[468] and observed the adequacy of the CPP's timeline.[469] Even though a replacement may differ from the CPP in certain respects, this groundwork will still allow States to more quickly comply with its requirements.

### B. The Replacement Should Not Weaken or Narrow the New Source Review Program.

The replacement should not weaken or limit the scope of the NSR Program, a core pillar of the CAA that protects communities from increases in harmful air pollution that may result from modifications to major pollution sources such as power plants. The CAA requires modified existing major stationary sources of air pollution to obtain preconstruction permits before beginning construction, and this requirement has long co-existed with section 111(d) emission guidelines without any special tailoring. Nothing in the ANPR suggests any reason why existing power plants that are subject to section 111(d) carbon pollution limits should not have to comply with time-tested protections against increases in harmful air pollution.

In the CPP, EPA itself carefully evaluated the potential NSR implications of the rule and adopted a flexible approach that was designed to operate alongside and without is to the existing NSR program – demonstrating that there is no need to weaken NSR in order to implement carbon pollution limits for power plants. EPA noted in the CPP that a State's 111(d) plan might impose requirements requiring an affected EGU to undertake physical or operational changes to improve its efficiency that would result in an increase in the unit's dispatch and an increase in the unit's annual emissions, and this may trigger NSR preconstruction permitting requirements.[470] However, EPA also noted that it anticipated very few instances of this occurring, and States had flexibility to design plans that avoid triggering NSR, for example by reducing demand or by increasing utilization of renewable energy.[471] EPA also adjusted the CPP's timelines to allow sufficient time for States to gather necessary permits.[472] Although the mere fact that section 111(d) emission guideline might trigger NSR would not by any means constitute a reason to amend NSR protections, there is simply no basis for EPA to conclude that a properly designed emission guideline would have that effect.

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[467] *Id.* at A91-A92 (declaration of Douglas L. McVay, Rhode Island Department of Environmental Management).
[468] *Id.* at A106 (declaration of Dick Pedersen, Oregon Department of Environmental Quality) ("The Department of Environmental Quality (DEQ) has begun working closely with the Oregon Department of Energy (Energy Department) and the Oregon Public Utility Commission (PUC) to develop the state's compliance plan. These agencies have held individual and open forum meetings with stakeholders, including an initial, open stakeholder meeting on October 27, 2015, that included representatives from power companies, environmental organizations, and ratepayer organizations. The group discussed stakeholder input received to date, criteria for evaluating compliance options, conceptual compliance scenarios, and the proposed process that will be used to develop Oregon's plan."); *id.* at A169-A170, (declaration of Craig A. Wright, New Hampshire Department of Environmental Services) (discussing steps to hold stakeholder meeting and notify affected power plants and interested parties); CPP Final Rule at 64,857 (EPA noting numerous actions by states to begin preparing for CPP compliance).
[469] Joint Addendum at A135 (declaration of Jared Snyder**,** Climate Change, New York State Department of Environmental Conservation) ("I am confident that the State will be able to meet the deadlines established for state submittals under the Clean Power Plan."); *id.* at A142 (declaration of Martin Suuberg, Massachusetts Department of Environmental Protection) ("I anticipate that Massachusetts will be able to comply with the state planning requirements of the Section 111(d) Rule in a timely fashion").
[470] CPP Final Rule at 64,920.
[471] *Id*.
[472] *Id*.

Additionally, any attempt to make broadly applicable changes to NSR would need to go through a separate rulemaking to be addressed on its own merits, and should not occur in a section 111(d) rulemaking for power plants. If EPA decides to make changes to NSR, that rulemaking would need to consider all of the relevant statutory factors and the full consequences for public health and the environment, not merely the impact of NSR on a replacement for the CPP. Changing NSR through a 111(d) rulemaking would deprive the public of proper notice that EPA was contemplating these changes, and risk a resulting process that fails properly to weigh considerations that may not surface in the context of NSR's interaction with a replacement for the CPP.