March 16, 2026

VIA CERTIFIED AND ELECTRONIC MAIL

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Re: New Source Performance Standards Review for Stationary Combustion Turbines and Stationary Gas Turbines, Docket No: EPA-HQ-OAR-2024-0419, 91 Fed. Reg. 1910 (Jan. 15, 2026).

Pursuant to Section 307(d)(7)(B) of the Clean Air Act,[1] the Clean Air Task Force, Environmental Defense Fund, Natural Resources Defense Council, and Sierra Club ("Petitioners") respectfully petition the Environmental Protection Agency ("EPA") for reconsideration and strengthening of its Final Rules ("Final Rule" or "Rule") adopting New Source Performance Standards for Stationary Combustion Turbines, which protect the public from nitrogen oxide (NOx) emissions.[2] Because judicial review of the rule is available by the filing of a petition for review within 60 days of rule publication on January 15, 2026, the grounds for the objections arose "within the time specified for judicial review." Clean Air Act § 307(d)(7)(B).

Reconsideration is warranted because the objections raised in this petition are of central relevance to the outcome of the Final Rule, and address aspects of the rule where EPA failed to provide adequate notice and opportunity for public comment. Our objections are of "central relevance" to

[1] 42 U.S.C. § 7607(d)(7)(B).
[2] 91 Fed. Reg. 1910 (Jan. 15, 2026)

the outcome of this rule, 42 U.S.C. § 7607(d)(7)(B), because—consistent with EPA's interpretation of that term—they present "substantial support for the argument that the regulation should be revised." *Chesapeake Climate Action Network, et al. v. EPA*, 952 F.3d 310, 322 (D.C. Cir. 2020). Indeed, our objections go to one of the fundamental purposes of the Final Rule: to reduce health-harming emissions from combustion turbines. Moreover, each of these issues involve aspects of the Final Rule that differed substantially from the proposed rule. As such, "it was impracticable to raise such objection[s]" during the public comment period. 42 U.S.C. § 7607(d)(7)(B). But to the extent that Section 7607(d)(7)(B) criteria are not met, EPA should exercise discretionary authority to reconsider the Rule so that the serious errors and missteps identified herein are corrected.

Although reconsideration is warranted, Petitioners reserve the right to seek immediate judicial review on all of the issues raised herein, and do not concede that they failed to raise with reasonable specificity and exhaust any issues or claims during the public comment period.[3]

[3] *See Comments of Sierra Club, Environmental Defense Fund, Clean Air Task Force, and Clean Wisconsin on EPA's Review of New Source Performance Standards for Stationary Combustion Turbines and Stationary Gas Turbines*, Dkt. No. EPA-HQ-OAR-2024-0419-0061 (Mar. 15, 2025), https://downloads.regulations.gov/EPA-HQ-OAR-2024-0419-0061/attachment_1.pdf (hereinafter "Pet. Rulemaking Comments").

Contents

I. EPA's Failure to Quantify and Consider Health Benefits is Unlawful and Arbitrary

In the proposal, EPA quantified the present value of its proposed standards' health benefits as ranging from $107 million to $505 million, applying a 2% discount rate. *Regulatory Impact Analysis for the New Source Performance Standards Review for Stationary Combustion Turbines* 61 tbl.22 (Nov. 2024), EPA-HQ-OAR-2024-0419-0005 [hereinafter Proposed Rule RIA]. But in the Final Rule, EPA abruptly abandoned its longstanding practice of evaluating the quantified health benefits – a decision it made without any advance notice or solicitation of comment, and without reasoned explanation.

EPA did not provide an opportunity to comment on this approach in the Proposed Rule. Its choice to abandon its established practice of quantifying human health benefits, and to ignore those health benefits in making regulatory decisions in the Final Rule, runs afoul of substantive and procedural Clean Air Act requirements. These errors are "of central relevance to the outcome of the rule" and warrant reconsideration. 42 U.S.C. §7607(d)(7)(B). Despite lack of notice, Petitioners and others emphasized the importance of the Rule's health benefits in comments.

Protecting public health and welfare is the central purpose of section 111. *See* 42 U.S.C. § 7411(b)(1); *Am. Lung Ass'n v. EPA*, 985 F.3d 914, 993 (2021) ("Control of emissions from existing sources before they harm people and the environment is the central purpose of Section 7411(d) of the Clean Air Act"); *id.* at 993-95. Here, EPA finalized a rule that is projected to forego nearly all of the expected NOx reductions associated with the proposed rule and even has the potential to *increase* NOx emissions compared to the previous 2006 Rule. *See infra* Table 3 (reflecting estimated increases in years 2027, 2028, 2029, 2030, 2031). EPA cites cost-savings and reductions in emissions of other pollutants as a basis for weakening the NOx standards from the proposal. 91 Fed. Reg. at 1962. At the same time, EPA chose not to quantify or monetize health impacts, citing uncertainty. *Economic Impact Analysis for the New Source Performance Standards Review for Stationary Combustion Turbines* 34-36 (Jan. 2026), EPA-HQ-OAR-2024-0419-0237 [hereinafter Final Rule EIA].

As detailed below, EPA's failure to adequately assess the health impacts of its standards as a relevant factor in its assessment of the BSER criteria was arbitrary. In addition, EPA's decision to abandon its rigorous, peer-reviewed methodology for quantifying impacts given alleged uncertainty is arbitrary.

A. EPA's Justification for Abandoning SCR-Based Standards and Failing to Analyze Associated Health Impacts is Unlawful and Arbitrary

CAA section 111(a)(1) provides that performance standards are to reflect "the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated." 42 U.S.C. § 7411(a)(1). EPA evaluated two technologies as potential components of the best system of emissions reduction ("BSER"): combustion controls and post-combustion selective-catalytic reduction ("SCR").

Based on its analysis of the section 111 factors, EPA proposed SCR in combination with combustion controls as the BSER for several subcategories (*see* Table 1). As acknowledged by EPA in the proposal, SCR is more protective than combustion control technology alone and is already widely adopted as an emissions control strategy for many types and sizes of stationary combustion turbines. EPA explained that 100 percent of all new combined cycle units and approximately 75 percent of all new simple cycle units in the power sector installed SCR in the 5 years preceding the proposal. 89 Fed. Reg. at 101,326.

As part of its analysis of non-air quality health, environmental, and energy considerations under section 111, EPA found that SCR could result in increases of ammonia emissions given the ammonia reagent needed to operate SCR. EPA also explained that SCR reduces the efficiency of a combustion turbine through the auxiliary/parasitic load requirements, which would result in increases of carbon dioxide emissions. EPA ultimately found that the non-air quality health and environmental impacts and energy requirements of SCR are acceptable for stationary combustion turbines. 89 Fed. Reg. at 101,306, 101,330, 101,332, 101,334.

EPA reversed course in the Final Rule and finalized SCR as a component of the BSER for a single subcategory. 91 Fed. Reg. 1910. In addition, EPA weakened the standard for large, low-utilization, high efficiency turbines compared to the 2006 Rule. (compare Table 1 and Table 2, below).

Table 1: Proposed New or Reconstructed Gas Plant Standards *CC means combustion controls only, SCR means combustion controls *and* SCR, and DFC means diffusion flame controls. EPA standard is in lb/MMBtu, table shows PPM equivalent for convenience.

Capacity Factor & Base Load Rating	≤ 250 MMBtu/h	> 250 MMBtu/h and ≤ 850 MMBtu/h	> 850 MMBtu/h
≤ 20 percent		25 ppm (CC)	15 ppm (CC)
> 20 percent		3 ppm (SCR)	3 ppm (SCR)
≤ 40 percent	25 ppm (CC)		
> 40 percent	3 ppm (SCR)		

Table 2: Final New or Reconstructed Gas Plant Standards

Utilization & Base Load Rating	≤ 50 MMBtu/h	> 50 MMBtu/h and ≤ 850 MMBtu/h	> 850 MMBtu/h
Low		25 ppm (CC)	25 ppm (CC) (high efficiency) 9 ppm (CC) (low efficiency)
High		15 ppm (CC)	5 ppm (SCR)
Any	25 ppm (CC)		

As a basis for reversing course on SCR, EPA cited cost considerations[4] and increases in potential ammonia emissions and "other" pollutants.[5] EPA noted that these increases in emissions "support the conclusion" that SCR does not qualify as the BSER for large turbines and "tip[s] the scale away" from qualifying SCR as the BSER for small and medium combustion turbines. 91 Fed. Reg. at 1937-38. However, EPA fails to demonstrate why the Rule's decrease in ammonia emissions outweighs the increase in NOx resulting from EPA's decision to finalize less stringent standards than proposed. Indeed, the analysis EPA presented in the Proposed Rule RIA – which quantified both the health benefits of NOx reductions as well as ammonia-related disbenefits – indicates that the SCR-based standards in the proposed rule would result in substantial overall health benefits.[6] Compared to the Proposal, in 2032 alone the Final Rule results in 178 tons less of ammonia emissions, but an increase of 2,363 tons of NOx (*See* Tables 3, 4). Notably, between 2027 and 2032, the Final Rule's standards may even result in an *increase* of NOx emissions relative to the previous standards that had been in effect since 2006 (*See* Table 3).

Table 3: Estimated NOx Impacts in Proposal and Final Rule

NOx Emissions (tons)	Proposal[7]	Final[8]
2027	-198	41 to 88
2028	-714	−26 to 68
2029	-1,229	−94 to 47
2030	-1,744	−161 to 27
2031	-2,259	−229 to 5
2032	-2,659	−296 to −15

Table 4: Estimated Ammonia Impacts in Proposal and Final Rule

Ammonia Emissions (tons)	Proposal[9]	Final[10]
2027	-21	-1
2028	-65	-12
2029	-108	-22
2030	-152	-33
2031	-196	-44
2032	-232	-54

EPA's decision to decrease other pollutants at the expense of thousands of tons of NOx emissions, in the absence of *any* readily quantifiable information about the relative health impacts of these pollutants, fails to consider an "important aspect of the problem." *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983). Cost and tons reduced alone cannot be used as an effective metric to compare whether harms from one pollutant outweigh harms from

[4] Petitioners' discuss EPA's cost considerations below in section II.
[5] In the proposal, EPA detailed potential increases in carbon emissions. In the Final Rule, EPA broadly asserts potential increases in formaldehyde emissions. 91 Fed. Reg. at 1937.
[6] *See* Proposed Rule RIA at 61 (comparing monetized benefits from NOx reductions with disbenefits from ammonia emissions).
[7] 89 Fed. Reg. at 101,350.
[8] 91 Fed. Reg. at 1962.
[9] 89 Fed. Reg. at 101,350.
[10] 91 Fed. Reg. at 1963.

another. And EPA's vague assertions that ammonia slip "tip[s] the scale away" from a more protective BSER, when the actual health impacts of NOx and ammonia emissions are readily susceptible to quantification and comparison (as EPA demonstrated in the Proposed Rule), is clearly arbitrary. That EPA's quantified analysis of health benefits for the Proposed Rule found that the health benefits of greater NOx reductions clearly outweigh ammonia disbenefits makes EPA's failure to explain its weighing of these two pollutants in the Final Rule even more arbitrary. By finalizing a Rule that demonstrates a potential *increase* in NOx emissions and failing to analyze associated health impacts, EPA failed to "articulate a satisfactory explanation" and set forth a "rational connection between the facts found and the choice made." *State Farm*, 463 U.S. at 43 (quoting *Burlington Truck Lines, Inc. v. United States*, 371 U.S. 156, 168 (1962)). EPA ultimately failed to account for the important health impacts that § 111 requires it to consider. *Sierra Club v. Costle*, 657 F.2d 298, 326 (D.C. Cir. 1981) (EPA must treat the amount of air pollution as a relevant factor under § 111); 42 U.S.C. § 7411(b)(1)(A) (statute's protective purpose to address pollution that endangers public health and welfare).

B. EPA's Stated Basis for Refusing to Quantify Health Impacts is Arbitrary

In the Final Rule, EPA abruptly abandoned without reasoned explanation its longstanding practice of reporting the quantified health benefits projected to result from Clean Air Act emission standards. In declining to project or consider the health benefits associated with the weaker standards established in the Final Rule, EPA disregarded decades of guidance from experts, its own formal economic analysis guidelines and a large body of empirical evidence documenting a strong relationship between pollution exposure, mortality and morbidity.

EPA's choice to abandon its established practice of quantifying human health benefits is arbitrary and runs afoul of substantive and procedural Clean Air Act requirements. These errors are "of central relevance to the outcome of the rule" and warrant reconsideration. 42 U.S.C. § 7607(d)(7)(B). Had EPA properly reported and considered available information concerning monetized benefits, that information could have informed its selection of appropriate best systems of emission reduction—resulting in more protective NOx standards for combustion sources.

i. Background on EPA's Methodology

For decades, EPA has built and refined the scientific infrastructure to answer a fundamental question: what is the cost, in human lives and suffering, of industrial pollution within the air we breathe? Over the years, EPA, working in close collaboration with outside experts, has developed and improved a rigorous suite of peer-reviewed and robust methodologies to quantify and monetize the public health benefits of air pollution reductions. These methodologies have been used to aid policymakers and the public in understanding the health impacts of EPA's regulatory actions in countless rulemakings across administrations of both parties.

Since 1993, EPA has maintained a practice of quantifying public health benefits as fully as possible within regulatory impact analyses. That practice has been required by Executive Order 12,866, which directs that agencies "assess all costs and benefits of available regulatory alternatives" with such costs and benefits to include both "quantifiable measures" "to the fullest extent that these can

be usefully estimated," as well as "qualitative measures . . . that are difficult to quantify, but nevertheless essential to consider." Exec. Order No. 12,866, 58 Fed. Reg. 51,735 (Oct. 4, 1993).

To meet the requirements of Executive Order 12,866, EPA has formally memorialized benefits quantification methodologies through its Guidelines for Preparing Economic Analyses. U.S. EPA., *Guidelines for Preparing Economic Analyses* (2024) [hereinafter Guidelines]. EPA most recently revised and published in 2024 a third edition of the Guidelines. The Guidelines as revised "establish a sound scientific framework for performing economic analyses of environmental regulations and policies." US EPA, Landing Page for *Guidelines for Preparing Economic Analyses, 3rd Edition,* https://www.epa.gov/environmental-economics/guidelines-preparing-economic-analyses-3rd-edition (last updated Dec. 1, 2025). They describe the very "best practices for economic analysis grounded in the economics literature." U.S. EPA, *Guidelines for Preparing Economic Analyses, 3rd Edition* at 1-1 (Dec. 2024), https://www.epa.gov/system/files/documents/2024-12/guidelines-for-preparing-economic-analyses_final_508-compliant_compressed.pdf. And they ensure "high-quality analyses and consistency" in how "economic analyses are prepared, performed and reported." *Id.*

Among other things, the Guidelines include detailed guidance regarding how to prepare mortality risk valuation estimates (*see* Guidance Appendix B). The Guidelines also contain detailed guidance for how to address and account for analytic uncertainty, which is inherent in all benefit cost analyses. *See* Guidelines at 5-29 to 5-34. The Guidelines, for example, explain that in assessing and presenting uncertainty, analysis should generally present outcomes or conclusions based on the most plausible values and perform sensitivity analysis on key assumptions. *Id.* at 5-29. The Guidelines also address how to communicate uncertainty in the analysis. *Id.* at 11-13.

The Guidelines as most recently revised underwent extensive external peer review prior to finalization. All chapters of the Guidelines underwent external peer review either through EPA's Science Advisory Board or through independent review by external experts.

Consistent with its Guidelines and its long-standing practice in Clean Air Act rulemakings, EPA released with its proposed rule a regulatory impact analysis that assessed the monetized benefits related to avoided premature mortality and morbidity associated with reduced exposure to NOx as a precursor to ozone and PM2.5. *See* Proposed Rule RIA. EPA generally calculated health benefits by estimating counts of air pollution-attributable cases of adverse health outcomes and assigning dollar values to those counts. *Id.* at 27-28. EPA constructed those estimates by adapting primary research—specifically air pollution epidemiology studies and economic value studies—from similar contexts. *Id.* EPA extensively described the scientific bases for its estimates and explained how it addressed uncertainty in the proposal. *Id.* at 30-31, 34-41.

Each one of these steps relied on well-established resources and methods that EPA has repeatedly used in Clean Air Act rulemakings across administrations, that utilize transparent and rigorous means for identifying and accounting for uncertainties, and that have undergone rigorous review by the Science Advisory Board and the Clean Air Scientific Advisory Committee ("CASAC"). In identifying specific health-related impacts associated with PM2.5 and ozone, for example, EPA expressly relied upon the most recent Integrated Science Assessments ("ISAs") prepared for

review of the National Ambient Air Quality Standards ("NAAQS"), each of which underwent external review by the CASAC and subsequent EPA revision and improvement. *Id.* at 28, 32. Likewise, EPA's approach to quantifying and monetizing the health impacts associated with changing concentrations of these pollutants is grounded in its 2023 Technical Support Document ("TSD"), *Estimating PM2.5- and Ozone-Attributable Health Benefits*, which was updated for the 2023 proposed reconsideration of the PM2.5 NAAQS. Proposed Rule RIA 27-31 (citing *Technical Support Document for the 2022 PM NAAQS Reconsideration Proposal RIA: Estimating PM2.5- and Ozone-Attributable Health Benefits* (2023), https://www.regulations.gov/document/EPA-HQ-OAR-2019-0587-0063 [hereinafter 2023 TSD]. This TSD was further revised and improved in June 2024, just months before the Proposed Rule, in response to an SAB review that concluded the TSD's approaches are "scientifically robust and appropriate for regulatory analyses."[11]

Notably, this TSD includes an entire chapter exhaustively discussing the various sources of uncertainty associated with quantifying and valuing PM2.5 and ozone-related health impacts, as well as the multiple techniques the Agency has incorporated into its analysis to assess and characterize those uncertainties. *Estimating PM2.5- and Ozone-Attributable Health Benefits: 2024 Update* 103 (2024), https://www.epa.gov/system/files/documents/2024-06/estimating-pm2.5-and-ozone-attributable-health-benefits-tsd-2024.pdf [hereinafter 2024 TSD]. For example, for PM2.5 risks, the TSD discusses EPA's use of Monte Carlo methods to quantitatively assess statistical uncertainties with respect to health risks and economic valuation of health harms; statistical techniques and use of sensitivities to assess confounding factors and other sources of uncertainty in the key health studies used to evaluate mortality risk; and consideration of a variety of studies featuring alternative risk estimates for non-mortality health impacts. *Id.* at 103-118. The TSD contains a similar discussion of multiple methods used to characterize uncertainty for ozone-related health impacts, *id.* at 119-127, as well as an explanation of how EPA has used sensitivity analysis and other techniques to evaluate uncertainties associated with cross-cutting factors such as the baseline incidence of health conditions that are exacerbated by PM2.5 and ozone, the "lag" between air pollution exposure and health effects, and other sources of uncertainty. *Id.* at 128-147.

Finally, the Proposed Rule RIA describes how EPA has used this approach to quantifying and valuing health impacts from PM2.5 and ozone as the basis for a simplified or "reduced form" methodology to estimate health impacts based on the average health benefits of reducing these pollutants on a per-ton basis. Proposed Rule RIA at 37, 74. EPA has most recently documented this benefit-per-ton approach in a 2023 TSD, which incorporated revisions and improvements in response to a 2021 review by the SAB, as well as updated emissions inventories and the most recent ISAs for PM2.5 and ozone. *Technical Support Document: Estimating the Benefit per Ton of Reducing Directly-Emitted PM2.5, PM2.5 Precursors and Ozone Precursors from 21 Sector*s 6 (2023) (Doc ID EPA-HQ-OAR-2024-0419-0013, attach. 105); Proposed Rule RIA at 73-74. In the Proposed Rule RIA, EPA explained that it was using national estimates of benefits-per-ton for NOx due to the time constraints of the rulemaking and uncertainty as to where new sources would

[11] EPA Science Advisory Board, *Review of BenMAP and Benefits Methods,* EPA-SAB-24-003, Transmittal Letter (2024), https://sab.epa.gov/ords/sab/f?p=114:0:17107614755045:APPLICATION_PROCESS=REPORT_DOC:::REPORT_ID:1124.

be constructed. EPA acknowledged that the use of BPTs is subject to uncertainty, and provided both a qualitative description of the sources of uncertainty as well as quantitative information about how BPTs for different sectors compare with each other as well as with "full-form" air quality modeling. Proposed Rule RIA at 40, 42-43. To further characterize the uncertainty around its estimates, EPA presented alternative estimates of the health impacts associated with the rule based on BPTs for three different source categories (industrial boilers, oil and gas facilities, and electric generating units). *Id.* at 44.

In sum, the analysis of ozone and PM2.5-related health impacts presented in the Proposed Rule RIA was consistent with EPA's well-established methodologies and agency-wide guidelines for regulatory analyses; rested on a vast body of public health science and EPA technical resources that have undergone peer review and/or review by EPA's external advisory boards; and thoroughly explained both the assumptions and approaches used as well as the nature and extent of relevant uncertainties.

ii. EPA's choice to abruptly abandon its longstanding policy regarding calculation of environmental benefits is arbitrary.

EPA's decision in the Final Rule to abruptly abandon this well-established and scientifically robust approach to evaluating health impacts is arbitrary. Where benefits are practicable to quantify through scientific methods, but difficult to quantify with precision, the appropriate response is to assign a value and disclose the nature of the uncertainty as EPA did at the proposal stage. By continuing to quantify compliance costs in precise dollar terms while casting aside any quantification of health benefits, EPA has produced a systematically skewed regulatory impact analysis that overstates net costs and precludes fair comparison of regulatory alternatives. *Cf. Ctr. for Biological Diversity v. NHTSA*, 538 F.3d 1172, 1198 (9th Cir. 2008) (where an agency uses a cost-benefit analysis, it "cannot put a thumb on the scale by undervaluing the benefits and overvaluing the costs of more stringent standards").

EPA's abrupt reversal on benefits quantification also flouts established administrative law principles. When an agency reverses a longstanding policy, it must acknowledge it is changing course and, in some cases, provide a more "detailed" and reasoned justification than in a circumstance where it is operating on a blank slate. *FCC v. Fox Television Stations, Inc*., 556 U.S. 502, 515-16 (2009). Here, EPA's stated justification for declining to report and consider hundreds of millions of dollars in potential quantified health benefits—set forth in a few short paragraphs of the preamble—falls far short of that standard.

As an initial point, EPA fails in the Final Rule to acknowledge the extent to which it is changing course and the nature of the scientific foundation and support for its prior approach. In the brief passage that EPA devotes to the announced policy change, EPA does not once even reference its peer-reviewed, twelve-chapter, four-hundred-plus page Guidelines for Economic Analyses or begin to explain why its numerous specific departures from the specific recommendations therein are justified (even though to this day EPA commits to adhering to those guidelines on its website). EPA provides no explanation as to why its long-standing methods for evaluating and presenting uncertainties around its health impacts estimates are no longer appropriate. Nor does EPA

acknowledge that nearly all aspects of its prior approach have been extensively vetted and endorsed by EPA's Science Advisory Board. Nor does EPA explain why it is violating the requirement in Executive Order 12,866 compelling the Agency to quantify health benefits to the fullest extent possible.

Under these circumstances, EPA's brief acknowledgement that it held a previous practice of quantifying environmental benefits is not enough to meet requirements for adequately explaining a shift in Agency position. EPA's obligation to "provide a reasoned explanation" for "disregarding" the specific "facts and circumstances that underlay or were engendered by the prior policy," *Fox Television Stations*, 556 U.S. at 516, encompasses an obligation to acknowledge and address all of the particular factual premises and reasoning that underpinned the Agency's longstanding prior approach to benefits quantification. Thus, EPA must not just acknowledge the general change in policy direction, it must disclose each of the pertinent aspects of its Guidelines that it is now departing from, and provide a reasoned explanation for abandoning all of them. EPA falls short of doing so in the brief six-paragraph passage where EPA announces its sudden refusal to quantify health benefits. Indeed, in this passage EPA does not even acknowledge that it has in place extraordinarily detailed, and rigorously peer-reviewed economic analysis guidelines.

In any event, beyond failing to acknowledge all the facts and circumstances underlying its prior policy, EPA fails to provide a coherent basis for reversing its longstanding approach to economic analysis. EPA identifies no new scientific evidence or flaw in the existing scientific literature that could justify entirely failing to quantify or monetize health benefits wholesale.

EPA principally points to uncertainty, stating that its "analytical practices often provided the public with a false sense of precision and more confidence regarding the monetized impacts of fine particulate matter and ozone than the underlying science could fully support." 91 Fed. Reg. at 1964. However, this conclusory statement neither acknowledges nor grapples with the strong scientific underpinnings for the approach EPA used to assess health impacts in the Proposed Rule RIA – including, as discussed above, the suite of ISAs and TSDs documenting EPA's analytical methods and characterizing sources of uncertainty, the SAB and CASAC reviews that scrutinized and supported EPA's methods for assessing health impacts, and the Agency's guidelines for economic analysis that have guided the development of its methodologies. *See* Bryan Hubbell and Alan Krupnick, Resources for the Future, *How the Environmental Protection Agency Got it Wrong About Monetizing Benefits of Air Pollution Regulations* (2026), https://media.rff.org/documents/Report_26-04_-_Update_2.3.26.pdf [hereinafter RFF Report] (submitted as attachment) (rebutting EPA's justification for abandoning impacts).

EPA's general invocation of uncertainty ignores that all economic benefits analyses involve uncertainty, and EPA has always acknowledged such sources of uncertainty and made the degree of uncertainty clear to the public within its economic analyses. As described above, EPA has exhaustively explained sources of uncertainty – and used a variety of tools to probe and present the extent of that uncertainty – at every step in the analytical process it used to assess the health

impacts of the proposed rule.[12] Further, in the analysis accompanying the proposed rule, EPA details the sources of uncertainty, presents multiple alternative estimates of health impacts to illustrate that uncertainty, and makes clear that in view of the significant uncertainties, the estimates of annual benefits "should be viewed as representative of the magnitude of benefits expected, rather than the actual benefits that would occur every year." Proposed Rule RIA at 48-49. In the Proposed Rule, EPA acknowledged that the use of BPTs is subject to uncertainty and provided both a qualitative description of the sources of uncertainty as well as quantitative information about how BPTs for different sectors compare with each other as well as with "full-form" air quality modeling. Proposed Rule RIA at 40, 42-43. EPA additionally presented alternative estimates of the health impacts associated with the rule based on BPTs for three different comparable sources. Proposed Rule RIA at 44.

The Final Rule never explains why this well-vetted and transparent approach now fails to pass muster – or why it is reasonable for EPA to provide *no estimates whatsoever* of the health impacts of its Final Rule, as opposed to utilizing its existing approaches while working to improve them over time. *See Ctr. for Biological Diversity*, 508 F.3d at 533 (finding that federal agency's refusal to quantify benefits of greenhouse gas reduction was arbitrary because "while the record shows that there is a range of values, the value of carbon emissions reduction is certainly not zero," and because the agency "has monetized other uncertain benefits" such as crash, noise, and congestion costs). In addition, EPA here did not discuss any alternative methodology to quantifying emissions. *See, e.g.* IEc, *Evaluating Reduced-Form Tools for Estimating Air Quality Benefits* (2019) (evaluating reduced form models), https://www.epa.gov/sites/default/files/2020-09/documents/adapted_rft_report_10.31.19.pdf (submitted as attachment). EPA claims that uncertainty "provide[s] the public with a false sense of precision and more confidence" (Final Rule EIA at 34) but fails to explain why the public would misunderstand uncertainties accompanying any health benefits quantification and why it is better to avoid quantification rather than explain the uncertainty.

EPA has thought extensively about the role of uncertainty in characterizing the impacts of regulatory actions. In its 2002 report, *Estimating the Public Health Benefits of Proposed Air Pollution Regulations* the National Academy of Sciences encouraged EPA to do more to characterize the uncertainty in its estimates and directly rejected the idea that uncertain results are of no value to decision-makers.[13] Partially in response to that report, in 2006 EPA completed its

[12] *See also* IEc, *Uncertainty Analyses to Support the Second Section 812 Benefit-Cost Analysis of the Clean Air Act* (2011) (analyzing uncertainty), www.epa.gov/sites/default/files/2016-01/documents/uncertaintyfullreport.pdf (submitted as attachment)

[13] National Research Council, *Estimating the Public Health Benefits of Proposed Air Pollution Regulations*, The National Academies 148 (2002), https://www.nationalacademies.org/read/10511/chapter/7#p20005c9f9970126001 ("There is a common misperception that a high degree of certainty is required for regulatory actions to take place to protect public health. As a result, primary health benefits analyses that more fully and accurately portray the uncertainties might not be considered useful. It is unrealistic for EPA to defer decisions until it can make them on the basis of perfect science. A careful and deliberate balancing of the benefits and costs is required, and this balancing must be informed by a fair assessment of the current levels of uncertainty and a realistic evaluation of the likely reductions in uncertainty attainable through further research.") (submitted as attachment)

expert judgment assessment[14] of the mortality impacts of exposure to fine particulate matter and subsequently used those results to characterize uncertainty in its analyses of major air quality rules affecting PM2.5, such as the 2012 PM NAAQS RIA.[15]

Moreover, as discussed in the RFF Report, substantial uncertainties surround regulatory cost estimates, and yet EPA makes no mention of equivalent concerns for those. RFF Report at 5. EPA's inconsistent treatment of uncertainty when it comes to evaluating costs is unexplained and arbitrary.[16] In any event, to the extent uncertainty is inherent to economic benefits analysis, the appropriate and logical response is for EPA to do what it did in the Proposed Rule and has done in every other comparable Clean Air Act rulemaking involving PM2.5 exposure in recent decades: EPA should identify the sources of uncertainties (and run accompanying sensitivity analyses as appropriate), as opposed to declining to report quantitative benefits. EPA's previous, well-established approach aligns with the Agency's guidelines as well as OMB guidance on regulatory cost-benefit analysis. *See* OMB Circular A-4 2, 28, 38-42 (2003) (stating that "[s]ound quantitative estimates of benefits and costs, where feasible, are preferable to qualitative descriptions of benefits and costs," and requiring agencies to address uncertainty transparently (e.g. through describing probability distribution and characterizing evidence under alternative scenarios, not to treat uncertain but real benefits as zero)).

EPA's new approach also fails to comport with Congress's general direction in the Clean Air Act. Recognizing the importance of meaningfully assessing benefits, Congress directed that EPA issue periodic reports about the impacts of the Clean Air Act and that EPA "consider all of the economic, public health, and environmental benefits" and further specified that "where numerical values are assigned to such benefits, a default assumption of zero value shall not be assigned to such benefits unless supported by specific data." 42 U.S.C. 7612(b). Although this directive is not directly applicable to section 111 rulemakings, it indicates Congressional support for quantification of health benefits where possible and bolsters the inference that EPA's refusal to quantify benefits based on vague assertions of uncertainty is arbitrary.

Moreover, the environmental benefits at issue are not nearly as uncertain as EPA now suggests. Expert scientific panels in the United States and globally have been consistent in their fundamental findings that short- and long-term exposures to PM2.5 are causally linked to premature mortality and that the overall evidence supports the use of a linear, no-threshold relationship to estimating

[14] IEc, Expanded Expert Judgment Assessment of the Concentration-Response Relationship Between PM2.5 Exposure and Mortality (2006), https://www.epa.gov/sites/default/files/2020-07/documents/pm_ee_report.pdf (submitted as attachment)

[15] *Regulatory Impact Analysis for the Proposed Revisions to the National Ambient Air Quality Standards for Particulate Matter* 5-12 to 5-19 (2012), https://www.epa.gov/sites/default/files/2020-07/documents/naaqs-pm_ria_proposed_2012-06.pdf.

[16] *See .e.g.,* Harrington, Morgenstern, and Nelson, On the Accuracy of Regulatory Cost Estimates, J. Pol'y Analysis and Mgmt, (2000) (finding that cost estimation is also uncertain, and that for half of the rules evaluated ex ante costs were overestimated, compared to only three rules where costs were underestimated.) (submitted as attachment)

mortality impacts. *See* RFF Report at 4. Also notably, there is reason to believe based on input from the Science Advisory Board that EPA's methodologies may be understating health harms.[17]

Beyond pointing to uncertainties, EPA suggests that it is interested in evaluating the benefits of air quality improvements relative to the national ambient air quality standards for PM2.5 and ozone, under the theory that no benefits are secured from reducing pollution in attainment areas. 91 Fed. Reg. at 1964. But as discussed in the RFF Report, the fact that a standard may be "requisite" to protect public health does not mean that there is no risk below the standard level. RFF Report at 6-7. As EPA concluded in its 2024 NAAQS PM2.5 Rule, studies examining this issue "continue to provide evidence of linear, no-threshold relationships between long-term PM2.5 exposures and all-cause and cause-specific mortality." 89 Fed. Reg. at 16,226 (Mar. 6, 2024). Moreover, as explained in the 2024 TSD for estimating health impacts from PM2.5 and ozone, the studies EPA uses to assess mortality impacts from long-term exposure to PM2.5 include substantial data from low-concentration exposures. EPA's SAB-reviewed assessment of those studies includes detailed evaluation of this source of uncertainty. 2024 TSD at 106-107. In the Final Rule, EPA has not identified any basis for ignoring its prior scientific judgment.

iii. EPA's reversal of its approach to quantifying benefits violates Clean Air Act procedural requirements.

EPA's reversal of its longstanding quantification policy is not just arbitrary substantively, it fails to meet procedural requirements set forth in subsections 307(d)(3), 307(d)(5) and 307(d)(6) of the Act. These provisions require that EPA provide adequate notice and opportunity for comment on significant aspects of a final rule. Subsection (d)(6)(A) further provides that a promulgated Final Rule must be accompanied by an explanation of the reasons for any major changes in the promulgated rule from the proposed rule along with a "statement" like that which must accompany a proposed rule that "set[s] forth or summarize[s] and provide[s] a reference to any pertinent findings, recommendations, and comments by the Scientific Review Committee . . . and the National Academy of Sciences, and, if the proposal differs in any important respect from any of these recommendations, an explanation of the reasons for such differences." 42 U.S.C. 7607(d)(3)(C), 7607(d)(6)(A)." In the proposal, EPA found that:

> The PM ISA, which was reviewed by the Clean Air Scientific Advisory Committee of the EPA's Science Advisory Board (U.S. EPA-SAB, 2019), concluded that there is a causal relationship between mortality and both long-term and short-term exposure to PM2.5 based on the body of scientific evidence. The PM ISA also

[17] *See* EPA Science Advisory Board*, Review of BenMAP and Benefits Methods* at 48-51 (2024) ("Literature suggests that exposure misclassification tends to bias reported hazard ratios downward leading to a low bias in risk estimates.") ("There is already good evidence that the CR function is increased by co-exposure to COVID-19 … and this is not reflected in historical epidemiologic studies developing the CR function used in BenMAP.") ("Emerging evidence suggests that mortality may be greater during the co-occurrence of extreme temperature and short-term peaks of PM2.5.") ("Mortality associated with PM2.5 may also be enhanced by climate change.") ("The studies available are not inconsistent with a linear relationship at levels below 12 ug/m3, but there is some limited evidence … for both supra and threshold effects at lower levels.")

> concluded that the scientific literature supports the use of a *no-threshold* log-linear model to portray the PM-mortality concentration-response relationship while recognizing potential uncertainty about the exact shape of the concentration-response function.

Proposed RIA at 30 (emphasis added). In the Final Rule, EPA now claims that it "may be appropriate for the EPA to separate exposures and impacts above the level of the [NAAQS] from those occurring at lower ambient concentrations." 91 Fed. Reg. at 1964. EPA does not reconcile this finding with review conducted by CASAC in the PM ISA. Based on the PM ISA, there is "evidence of linear, *no-threshold* relationships between long-term $PM_{2.5}$ exposures and all-cause and cause-specific mortality." 89 Fed. Reg. 16,202, 16,266 (2024) (citing 2019 ISA, pgs 11.84-11.89, 2022 ISA) (emphasis added); *See also* Policy Assessment for the Review of the National Ambient Air Quality Standards for Particulate Matter 3-10 (2021), https://www.epa.gov/system/files/documents/2021-10/final-policy-assessment-for-the-review-of-the-pm-naaqs-01-2020.pdf. EPA reached this conclusion after CASAC review of its 2019 PM ISA and 2022 Supplement to the ISA. *Id.* at 16,253; *See* Letter from Elizabeth A. (Lianne) Sheppard, Chair, Clean Air Scientific Advisory Committee, to Administrator Michael S. Regan. *Re: CASAC Review of the EPA's Policy Assessment for the Review of the National Ambient Air Quality Standards for Particulate Matter* 16 (March 18, 2022), https://www.4cleanair.org/wp-content/uploads/PM-NAAQS-CASAC-Responses-to-EPA-PM-Draft-PA-031822.pdf. Although there are potential uncertainties about the shape of the concentration-response function at lower concentrations (below 8 ug/m3), 89 Fed. Reg. at 16,266, EPA's statement in the EIA for the Final Rule that the NAAQS "are widely understood to represent the divide between clean air and air with an unacceptable level of pollution" does not accurately reflect either the statutory standard that governs the NAAQS or the CASAC-reviewed science. Final Rule EIA at 35. The Administrator's determination as to what level of the NAAQS will be "requisite to protect the public health" with an "adequate margin of safety" does not equate to a scientific finding that there are no or diminished health impacts below the NAAQS. RFF Report at 6.

In the Final Rule, EPA does not confront these pertinent findings, as it is required to do under Section 307(d). EPA's failure to engage with the ISA further underscores the substantive inadequacy, discussed in Section B above, of EPA's cursory justification for abandoning its longstanding benefits practice.

iv. EPA's failure to report and consider quantified benefits was a material error warranting reconsideration.

EPA's failure to report and consider quantified benefits, and its failure to comport with the procedural requirements of Section 307(d), were material errors "of central relevance to the outcome of the rule" and warrant reconsideration. 42 U.S.C. § 7607(d)(7)(B). There is a substantial likelihood that established standards would have been more stringent if quantified benefits had been calculated and considered by EPA.

To be clear, this is not to say that EPA must undertake and principally rely upon a formal cost-benefit analysis in the context of establishing section 111 standards. *See Portland Cement Ass'n v.*

Ruckelshaus, 486 F.2d 375, 387 (D.C. Cir. 1973) (holding that while cost-benefit studies "should be considered" where they are "adduced," they are not "a necessary condition of action"). Petitioners agree that EPA may take into account a number of different approaches to determining whether the costs of a control technology are reasonable, provided that whatever metric it relies upon is adequately explained and justified (and it was not here).

Where EPA endeavors to apply and rely upon an incremental dollars-per-ton cost-effectiveness metric to determine cost-reasonableness as it did in this rulemaking, EPA typically (a) first determines the incremental cost-effectiveness for a particular pollution control by assessing the amount of money it will cost for each ton of pollution removed from the air, and then (b) uses those figures to determine if the costs of the pollution control system is unreasonably high when considering the pollution reduction benefits and comparing to similar rules. The key lies in how EPA justifies its evaluation of cost-reasonableness: in all circumstances, EPA must be able articulate a rational basis for what it considers either a reasonable or unreasonable amount of money for regulated units to spend (in terms of dollars-per-ton) on NOx controls. If the agency establishes a cost-effectiveness limit that clearly separates reasonable from unreasonable level expenditures for NOx abatement, it must adequately justify that limit. Here, EPA's determination that SCR controls are not cost-reasonable for most affected units – based solely on apples-to-oranges comparisons with much older cost-effectiveness analyses for rules addressing different statutory standards, and in the absence of any information about the relative health benefits of reducing this pollution – fails to provide such a reasonable basis. *Cf. Michigan v. EPA*, 576 U.S. 743, 752-53 (no regulation is appropriate if it does significantly more harm than good and "consideration of cost reflects the understanding that reasonable regulation ordinarily requires paying attention to the advantages *and* the disadvantages of agency decisions"). EPA cannot rationally rule out technologies on a cost-per-ton basis while giving no weight or consideration to the health benefits that can be secured through that level of reduction.

In this case, and as discussed further below in Section II of this petition, EPA failed to justify its methodology for evaluating the cost-reasonableness of NOx controls while at the same time ignoring quantitative economic benefits information that would have been particularly probative in assisting EPA in arriving at an appropriate cost-effectiveness metric. Had EPA generated and considered information regarding the value of NOx-related health impacts associated with alternative potential standard levels, then those alternatives could have informed EPA's identification and application of a suitable cost-reasonableness metric, and EPA would likely have identified SCR as an appropriate best system of emission reduction for a broader scope of sources. In any event, even if EPA were not required to formally apply quantified benefits information in any particular way, entirely ignoring such highly probative information still constitutes, at a minimum, a failure to examine an important aspect of the problem—the hallmark of arbitrary agency action. *State Farm*, 463 U.S. at 43. The materiality of EPA's error is well-illustrated by the numbers at the proposal stage. EPA itself calculated that the health benefits of NOx reductions associated with the more stringent proposed standards ranged from approximately $200 million to $670 million in present value—a range of quantified benefits so substantial that no rational cost-reasonableness determination could treat it as irrelevant, and whose omission from the Final Rule

analysis cannot plausibly be characterized as inconsequential to the outcome. Propose Rule RIA at 42.

Further, as explained above, EPA's refusal to quantify or monetize the health impacts of the Final Rule is tied to its arbitrary and unexplained conclusion that the disbenefits of ammonia slip outweigh the benefits of NOx reductions resulting from SCR-based controls. The RIA for the Proposed Rule found that the overall health benefits of SCR-based standards were strongly positive, contrary to EPA's unsupported conclusions in the Final Rule.

In short, EPA should reconsider and reinstate its time-tested practice of reporting projected monetized public health benefits, while then additionally revising and strengthening the promulgated standards in the manner discussed below.

II. EPA's Approach to Costs and Its Determination of the Best System of Emission Reduction in the Final Rule Was Unlawful and Arbitrary in Multiple Ways.

A. EPA's determination in the Final Rule to exclude SCR from the best system for all large combustion turbines with annual utilization rates below 45 percent was flawed.

EPA should also reconsider its decision in the Final Rule to reject SCR as a component of the best system for large combustion turbines (>850 MMBtu/hr) with utilization rates below 45 percent. In the Final Rule, the agency justified its decision to consider only simple-cycle plant data for determining the cost-effectiveness of SCR at this cohort of units by citing to historical power plant operating data, which it did not do at proposal. *See* 91 Fed. Reg. at 1934. As we discuss below, this data undercuts, rather than supports, EPA's point. In the Final Rule, EPA also overhauled its capacity-based and utilization-based subcategories, significantly changed its position on what the Agency considers cost-reasonable, and greatly expanded its estimates of the capital costs associated with SCR at simple-cycle turbines. All of these unanticipated aspects of the Final Rule affected the outcome of EPA's decision to evaluate the cost-effectiveness of SCR at large, low-utilization turbines on the basis of simple-cycle technology only. Because they are centrally relevant to the rule, reconsideration is appropriate.

To reiterate, EPA determined in the Final Rule that SCR was not cost-effective at large-turbines at utilization rates below 45 percent, but erroneously relied solely on cost-per-ton figures associated with simple-cycle rather than combined-cycle units. The agency justified this approach as follows:

> Historical data indicates that simple cycle turbines in the utility sector typically have utilization rates of less than 20 percent, considerably lower than the 45 percent utilization level that defines the high-utilization subcategory. The long-term, fleetwide average utilization for large simple cycle turbines is approximately 9 percent. While some combined cycle turbines may also occasionally operate below a 45 percent utilization level on a 12-month basis, this is more unusual. Therefore, the EPA uses the costs of SCR for simple cycle turbines rather than combined cycle turbines when evaluating low-utilization turbines.

91 Fed. Reg. at 1934. While it is true that simple-cycle units operate at lower average utilization rates than combined-cycle units, this in no way justifies excluding *all* large turbines under 45 percent annual capacity factors from SCR-based requirements. On the contrary, except at very low utilization levels (i.e., below 10 percent annually), the substantial *majority* of large units operating below 45 percent are combined-cycle turbines, and an even greater percentage of the electricity generated at these levels comes from combined-cycle turbines.

EPA's own data illustrate this. As part of our review of the Final Rule, we carefully analyzed the spreadsheet "CAPD Data 2023 Nov 2024 (teams)," which EPA included in the docket as an attachment to *Combustion Turbines Inventory and NOx Control Technology Baseline TSD* (Docket No. EPA-HQ-OAR-2024-0419-0019).[18] This data set provides unit-level performance data for fossil fuel-fired electric generators in calendar year 2023. Considering the natural gas-fired combustion turbines in this data set, we found that 29 percent of units in this cohort operating at annual utilization levels of between 0 and 45 percent were combined-cycle facilities, and that over 70 percent of the electricity generated by such units was from combined-cycle turbines. Of gas-fired turbines with annual capacity factors between 10 and 45 percent, 63 percent of such units were combined-cycle, which generated 87 percent of the electricity for that cohort. And of the gas-fired turbines with annual capacity factors between 20 and 45 percent, 83 percent were combined-cycle units, which generated nearly 93 percent of the electricity provided by that cohort.

Despite these statistics, EPA's cost-effectiveness calculations for large turbines operating at annual factors below 45 percent assume that *none* of these units are combined-cycle turbines. In this regard, EPA has "offered an explanation for its decision that runs counter to the evidence before the agency," a textbook example of arbitrary and capricious decisionmaking. *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983). In the proposed rule, EPA had a better method of addressing this: it created a sub-category of "intermediate utilization," which covered those with utilization rates of between 20 and 40 percent, and which, for large turbines, established SCR-based NOx limits. Only those large units operating at capacity factors below 20 percent were exempt from SCR-based limits.[19] While petitioners' comments urged the agency to include SCR in the best system for *all* regulated units,[20] the proposal at least recognized that there was no cost-based justification to exclude SCR from the best system for large turbines at annual capacity factors above 20 percent.[21]

In the Final Rule, however, EPA lumps all large turbines with utilization rates below 45 percent into a single subcategory. The agency justifies its decision as follows:

> Based on the EPA's updated analysis of the cost and feasibility of available controls for combustion turbines, the Agency is determining in this Final Rule that SCR does not qualify as the BSER for any subcategory of stationary combustion turbines with 12-calendar month capacity factors less than or equal to 45 percent. Therefore,

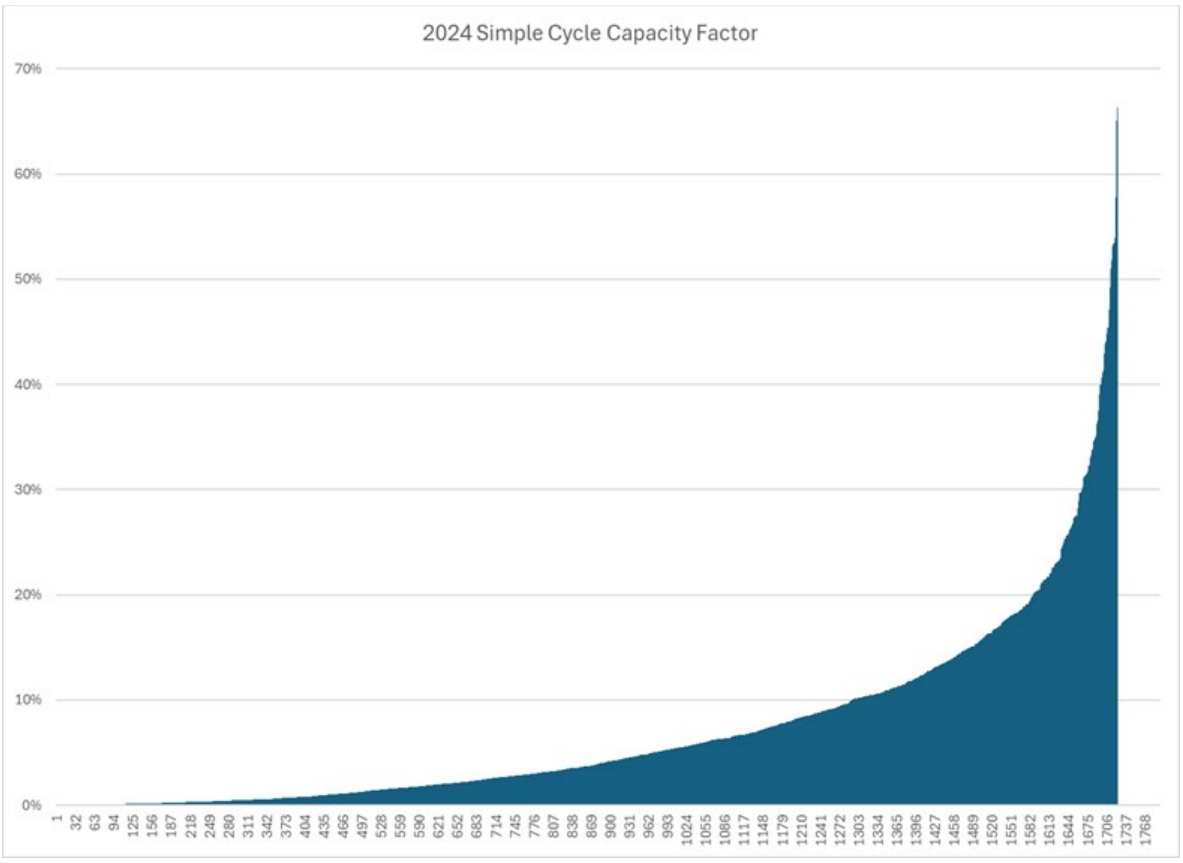
[18] EPA, *CAPD Data 2023 Nov 2024 (teams),* Combustion Turbines Inventory and NOx Control Technology Baseline TSD, Dkt. No. EPA-HQ-OAR-2024-0419-0019 (Dec. 17, 2024), available at https://www.regulations.gov/document/EPA-HQ-OAR-2024-0419-0019.
[19] Review of New Source Performance Standards for Stationary Combustion Turbines and Stationary Gas Turbines, 89 Fed. Reg. 101306, 101315 (Dec. 13, 2024).
[20] Pet. Rulemaking Comments at 19-20.
[21] *See* 89 Fed. Reg. at 101325-26.

> the proposed "intermediate load" subcategory that would have covered combustion turbines operating at annual capacity factors greater than 20 percent and less than or equal to 40 percent is no longer necessary.

91 Fed. Reg. at 1921. This is a classic case of begging the question. EPA asserts that an intermediate-load subcategory is "no longer necessary" because it has determined that SCR is not cost-effective for the entire cohort of large units with capacity factors below 45 percent. Yet in lumping together all of the units between 0 and 45 percent for the purposes of calculating cost-effectiveness, EPA's analysis assumes the very thing that is in question: whether a subcategory for units between 20 and 45 percent (or, for that matter, between 10 and 45 percent) is appropriate. Had EPA not performed a single catch-all cost-effectiveness calculation, but instead separately evaluated the cost-effectiveness of SCR at units with annual utilization rates between 20 and 45 and between 10 and 45 percent—*relying primarily on combined-cycle data, as reflected in EPA's own data set*—the agency would have found substantially lower dollars-per-ton of NOx abatement for SCR at those units.

As further evidence of its flawed approach, EPA did not even attempt to determine a truly representative capacity factor for simple-cycle turbines when determining the appropriate threshold for distinguishing high-utilization from low-utilization turbines. It did not, for instance, refer to the average or median capacity factors in its data set for simple-cycle turbines. Rather, it used the 99-percent confidence maximum 12-calendar-month capacity factor for such units over many years. 91 Fed. Reg. at 1921. In other words, it relied on a number that is predicted to occur *just one percent of the time.* This figure ended up being 43 percent, which EPA increased to 45 percent "[t]o account for potential future uncertainty." *Id.*

The actual record evidence paints a starkly different picture. As the next two charts show, simple-cycle turbines operate overwhelmingly at annual capacity factors below 10 percent, with only 8 percent of units operating above 20 percent utilization rates and far fewer above 25-30 percent.


2024 Simple Cycle Capacity Factor
70%
60%
50%
40%
30%
20%
10%
0%
1
32
63
94
125
156
187
218
249
280
311
342
373
404
435
466
497
528
559
590
621
652
683
714
745
776
807
838
869
900
931
962
993
1024
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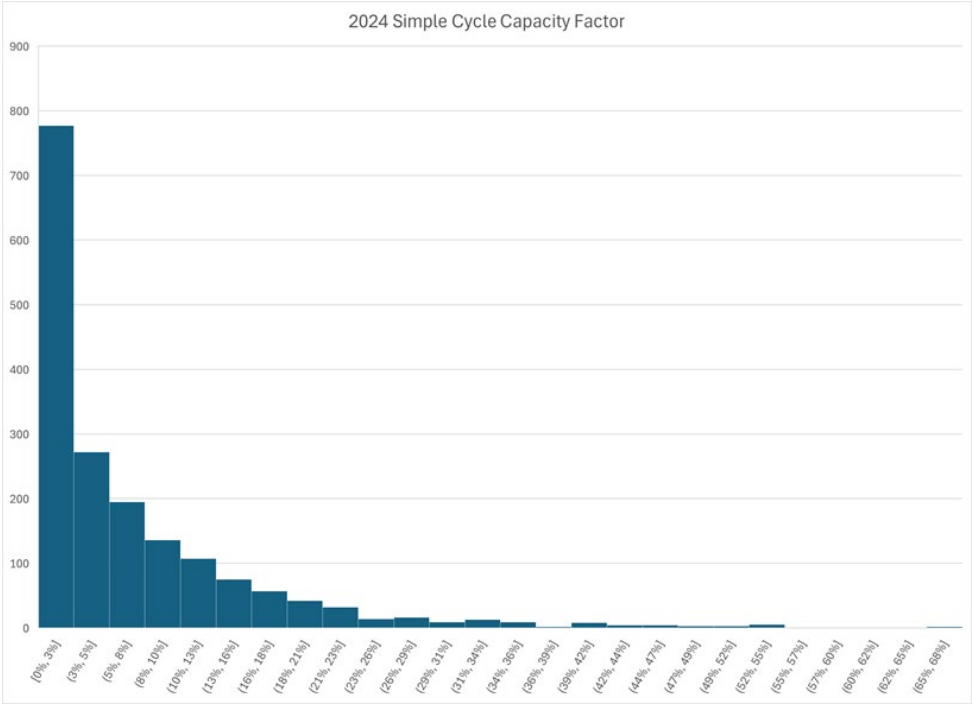
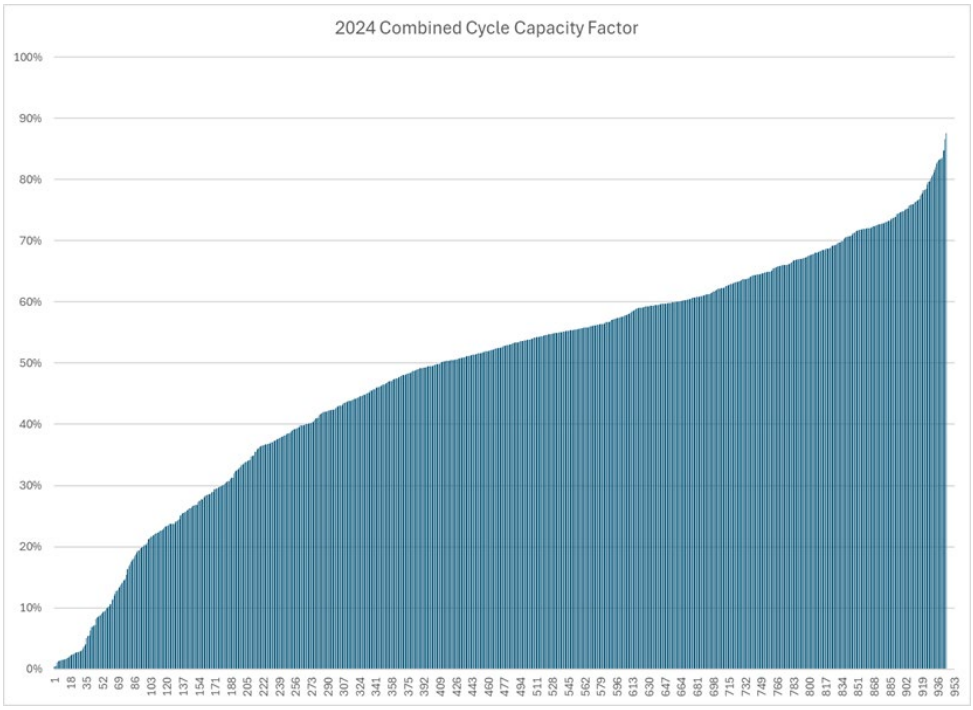

2024 Simple Cycle Capacity Factor
900
800
700
600
500
400
300
200
100
0
[0%, 3%]
(3%, 5%]
(5%, 8%]
(8%, 10%]
(10%, 13%]
(13%, 16%]
(16%, 18%]
(18%, 21%]
(21%, 23%]
(23%, 26%]
(26%, 29%]
(29%, 31%]
(31%, 34%]
(34%, 36%]
(36%, 39%]
(39%, 42%]
(42%, 44%]
(44%, 47%]
(47%, 49%]
(49%, 52%]
(52%, 55%]
(55%, 57%]
(57%, 60%]
(60%, 62%]
(62%, 65%]
(65%, 68%]

On the other hand, more than one-third of combined-cycle units operate below annual capacity factors of 45 percent, as seen in the chart below.



And, as discussed above, the sizable majority of units operating at utilization rates of between 10 and 45 percent—and even greater majority operating at rates between 20 and 45 percent—are combined-cycle. As the table below shows, even assuming EPA's NOx cost-reasonableness assumptions are sound (which, as discussed elsewhere in this petition, we do not), SCR is broadly cost-effective for large units at capacity factors well below 45 percent, even assuming EPA's low dry low-NOx burner ("DLNB") input emissions.

Turbine Size (MMBtu/h)	**Inlet NOX (ppm)**	**Outlet NOX (ppm)**	**40% annual CP**	**30% annual CP**	**20% annual CP**	**10% annual CP**
47	20.3	3.0	$19,222	$24,710	$35,645	$68,273
57	20.3	3.0	$17,129	$21,990	$31,669	$60,531
134	20.3	3.0	$10,915	$13,891	$19,804	$37,363
57	13.8	3.0	$26,778	$34,564	$50,069	$96,301
134	13.8	3.0	$16,823	$21,592	$31,062	$59,190
320	13.8	3.0	$11,478	$14,593	$20,755	$38,962
575	13.8	3.0	$9,267	$11,683	$16,449	$30,471
661	13.8	3.0	$8,844	$11,124	$15,620	$28,834
905	13.8	3.0	$7,996	$10,004	$13,956	$25,545
1,008	13.8	3.0	$7,735	$9,658	$13,441	$24,526

2,349	13.8	3.0	$6,028	$7,395	$10,074	$17,891
2,675	13.8	3.0	$5,802	$7,096	$9,632	$17,031
3,000	13.8	3.0	$5,608	$6,840	$9,253	$16,299
3,892	13.8	3.0	$5,180	$6,277	$8,429	$14,724
905	7.0	3.0	$14,737	$18,835	$26,928	$50,783
1,008	7.0	3.0	$14,154	$18,067	$25,790	$48,539
2,349	7.0	3.0	$10,467	$13,198	$18,575	$34,369
2,675	7.0	3.0	$9,998	$12,580	$17,663	$32,597
3,000	7.0	3.0	$9,598	$12,054	$16,889	$31,102
3,892	7.0	3.0	$8,731	$10,918	$15,229	$27,929
905	5.0	3.0	$28,320	$36,517	$52,703	$100,412
1,008	5.0	3.0	$27,155	$34,980	$50,426	$95,924
2,349	5.0	3.0	$19,781	$25,243	$35,996	$67,584
2,675	5.0	3.0	$18,843	$24,006	$34,172	$64,041

By entirely excluding combined-cycle operations and data in rejecting SCR as part of the "best system" for large turbines at utilization rates below 45 percent, EPA ignored its own data and reached an arbitrary decision. The agency must therefore reconsider the rule and re-evaluate SCR as an element of the best system for large combustion turbines with annual CFs as low as 10 percent.

B. The Final Rule's method of evaluating the cost-reasonableness of NOx controls was arbitrary and capricious.

i. To determine the best system of emission reduction, EPA must consider associated public health impacts when determining whether a particular cost-effectiveness value or range of values for NOx controls is reasonable, yet failed to do so in the Final Rule.

In the Final Rule, EPA relied heavily on an incremental dollars-per-ton cost-effectiveness metric when passing judgment on different NOx control technologies for inclusion in each relevant subcategory's best system of emission reduction. At no point in this process did EPA consider the public health benefits of NOx reductions when determining whether different technologies' cost-effectiveness values were or were not reasonable. At proposal, Petitioners had no way of anticipating that EPA would arbitrarily refuse to quantify or monetize the public health benefits provided through NOx reductions, nor that it would conclude that the accepted methodologies for doing so were so uncertain as to justify their exclusion from any regulatory decisionmaking process.[22]

Furthermore, whereas the proposal relied on cost-effectiveness values that were found to be reasonable in a prior rule geared toward safeguarding public health from NOx emissions—the 2023 Good Neighbor Plan—the Final Rule disclaims this precedent, and instead refers to cost-effectiveness evaluations for NOx controls from a *visibility-based* (rather than health-based)

[22] 91 Fed. Reg. at 1964 (discussing uncertainties in methodologies).

rulemaking—the agency's 2012 approval of North Dakota's Regional Haze SIP. This indicates a fundamental change in EPA's stance on the relationship between the public health impacts of NOx emissions and the dollars per ton that the agency considers reasonable for abating NOx emissions under Section 111. Petitioners could not have anticipated this change at the time of proposal, and because it directly affects EPA's determination of the best system and thus the rule's stringency, it is of central relevance. Reconsideration is thus warranted.

EPA's Final Rule excludes SCR as an element of the best system for all affected turbines except large, high-utilization turbines, primarily due to the agency's judgment that SCR would not be cost-effective for all other sub-categories of turbines. Yet the agency's apparent dollars-per-ton thresholds for NOx controls, such as the $12,000/ton figure from the inapposite North Dakota Regional Haze rule, do not reflect reasoned decision-making, and the agency must reconsider the rule to provide a more defensible, evidence-based foundation for evaluating whether a particular NOx control technology is or is not cost-effective.

In a section 111 rulemaking such as this one, EPA often addresses costs—one of the relevant statutory factors under 42 U.S.C. § 7411(a)(1)—by calculating the amount of money required for a particular control technology to reduce one ton of the target pollutant. This is called a cost-effectiveness value. If a particular control technology's dollars-per-ton cost-effectiveness value is above a level that EPA considers reasonable, and after considering other relevant cost considerations, it will often reject that technology as an element of the best system of emission reduction. The problem is, in the Final Rule, EPA articulates no rational basis for what it considers to be reasonable with respect to the cost-effectiveness values—whether incremental or total costs—for NOx controls, and makes no effort to incorporate the public health impacts of NOx into its evaluation of reasonableness. The rule is therefore arbitrary and capricious in this regard, and EPA must reconsider it to identify meaningful, evidence-based cost-effectiveness values for NOx controls that directly account for impacts to public health.

Although EPA must consider costs in selecting the best system of emission reduction, 42 U.S.C. § 7411(a)(1), the statute does not specifically require EPA to calculate dollars-per-ton cost-effectiveness values for each control option it considers, nor must the agency show that the best system satisfies a formal cost-benefit test analysis in the context of section 111. *See Ruckelshaus*, 486 F.2d at 387. Nor is it necessarily the case that a cost-effectiveness evaluation is always the best or most appropriate methodology for considering costs under section 111. Indeed, the case law holds that, to satisfy section 111's cost factor, EPA must only show that the costs associated with the best system are not "greater than the industry could bear and survive," *Portland Cement Association v. Train*, 513 F.2d 506, 508 (D.C. Cir. 1975), and that "EPA's choice [of a best system"] will be sustained unless the environmental or economic costs of using the technology are exorbitant." *Lignite Energy Council v. EPA*, 198 F.3d 930, 933 (D.C. Cir. 1999) (citing *National Asphalt Pavement Ass'n v. Train*, 539 F.2d 775, 786 (D.C. Cir. 1976)). In its regular practice, however, EPA nearly always evaluates—and gives great weight to—the cost-effectiveness values of different control options under section 111, often using both incremental and total cost analyses to inform its decisionmaking. The extent, then, that the agency does rely on such metrics—whether for total average cost, incremental cost, or both—EPA must explain why it considers certain values reasonable and others not.

EPA has failed to do so in the Final Rule. In justifying how it determines whether the cost-effectiveness values of NOx controls are reasonable, EPA merely points to two prior rulemakings: the 2006 section 111 NOx standards for industrial, commercial and institutional boilers (which EPA interprets as approving incremental NOx control costs of $7,400/ton in 2024 dollars as reasonable)[23] and 2012 approval by EPA of North Dakota's state implementation plan under the regional haze program (which had rejected an SCR-based NOx control requirement for a coal-fired power plant that would have imposed incremental $12,000/ton in 2024 money).[24] 91 Fed. Reg. 1933, n.110-111 (citing 71 Fed. Reg. 9866, 9870 (Feb. 27, 2006) and 77 Fed. Reg. 20894, 20929 (Apr. 6, 2012)). Yet neither of those rules describes *why* those values are or are not reasonable. For instance, nowhere in its review of North Dakota's regional haze SIP did EPA assert that the additional NOx-related health benefits that would have been achieved through SCR were not substantial enough to justify the $12,000/ton figure that the state had calculated for an SCR retrofit at that facility. Instead, EPA simply stated that this value was "high enough that we are not prepared to change our conclusion that the State's BART determination [excluding SCR] was reasonable." 77 Fed. Reg. at 20929. That EPA now treats the $12,000/ton figure from the 2012 North Dakota Regional Haze SIP as some kind of threshold calculation for an NSPS rulemaking is completely arbitrary, and a meaningful and unforeseeable departure from the proposed rule.

In the absence of any actual data, evidence, or even discussion pertaining to public health, "high enough" is not a meaningful standard. *Id.* As noted above, a cost-effectiveness calculation describes how much an operator must pay to achieve each ton of pollution abatement through a given technology, either as an average of total costs or on an incremental basis. But without analyzing the concrete benefits that would result from adopting that control technology, EPA has no way of determining whether the cost-per-ton is reasonable or not particularly in light of section 111's goal of safeguarding public health.

This requires an evidence-based inquiry that reflects the specific characteristics of the target pollutant and the statutory standard, and this cannot be a one-size-fits-all determination. This point is well illustrated by EPA's 2023 report on the social cost of greenhouse gases.[25] There, the agency used rigorous, peer-reviewed modeling platforms to estimate the negative social costs imposed by a marginal ton of carbon dioxide, methane, and nitrous oxide for each year between 2020 and 2080.[26] To use the 2030 estimates as an example, EPA found the social cost of carbon to be between $144 and $384 per ton; the social cost of methane to be between $1,924 and $3,169 per ton; and the social cost of nitrous oxide to be between $44,712 and $103,137 per ton.[27] The reason for the orders of magnitude difference in the three pollutants' social cost values is that methane is substantially more potent than carbon dioxide on a ton-for-ton basis, and nitrous oxide is, in turn,

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[23] *See* 71 Fed. Reg. 9866 (Feb. 27, 2006).
[24] *See* 77 Fed. Reg. 20894 (Apr. 6, 2012).
[25] EPA, *Supplementary Material for the Regulatory Impact Analysis for the Final Rulemaking, "Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review:" EPA Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances* (Nov. 2023), https://www.epa.gov/system/files/documents/2023-12/epa_scghg_2023_report_final.pdf. (submitted as attachment).
26 *See id.* at 1-19 (executive summary and introduction), 154-55 (table of social cost values).
[27] *Id.* at 154.

substantially more powerful than methane.[28] To arrive at these values, EPA undertook a comprehensive analysis of the specific impacts of each pollutant at a given quantity.

By contrast, EPA performed *no* analysis of the health impacts of NOx in determining the cost-reasonableness of NOx controls. Without in any way evaluating in concrete terms the impact that the regulated pollutant will have at a given scale, EPA cannot say that it is unreasonable to require operators to pay more than a certain dollar amount for each ton of that pollutant it reduces using a particular control technology. Nor can EPA simply import cost-effectiveness values used in prior rulemakings accomplishing different objectives and not noticed in the proposed rule to decide what is or is not reasonable today for NOx controls at combustion turbines. Particularly if those previous instances did not account for pollutant-specific health considerations, EPA cannot rely on them here without undertaking that same analysis.

The agency's arbitrary approach to cost-effectiveness not only compounds its failure to quantify and monetize health impacts across the rule more broadly, which we discuss in Section I, but it undercuts its rationale for that failure. EPA now asserts that its past practice of quantifying and monetizing the PM2.5 and NOx-related health impacts of its Final Rules "often provided the public with a false sense of precision and more confidence regarding the monetized impacts of fine particulate matter (PM2.5) and ozone than the underlying science could fully support, especially as overall emissions have significantly decreased, and impacts have become more uncertain." 91 Fed. Reg. 1964. Therefore, in order to "ensure the public is not misled regarding the level of scientific understanding," *id*, EPA has decided to forgo altogether any effort to quantify and monetize the PM2.5 and NOx impacts associated with the Final Rule's updated standards. Ironically, the agency nonetheless uses arbitrary dollar-per-ton values to exclude as unreasonable SCR-based NOx controls based on no science or evidence at all. It is EPA's groundless approach to evaluating cost-effectiveness that obscures the value of reducing NOx emissions – not the Agency's previous and long-standing practice of providing monetized health impacts of its rulemakings based on rigorous, peer-reviewed modeling.

In short, even while section 111 does not require EPA to use a dollars-per-ton cost-effectiveness metric to determine whether a control technology is financially reasonable or not, we assert that *if* EPA relies on cost-effectiveness calculations to evaluate NOx controls such as SCR, its approach must "reflect reasoned decisionmaking based on evidence in the record." By ignoring the public health impacts of NOx and by narrowly relying on unnoticed, incremental cost-effectiveness comparisons to rules from different contexts, EPA did not do that here, and must reconsider the rule to avoid the irrational and arbitrary result of applying a cost-effectiveness threshold that lacks any reasoned basis in the record.

ii. In any event, the Final Rule's treatment of EPA's cost-effectiveness determinations for NOx controls from prior rulemakings was arbitrary and capricious.

[28] *See id.* at 141-142 (discussing global warming potentials for methane and nitrous oxide relative to carbon dioxide).

EPA should also reconsider EPA's treatment of cost-effectiveness for NOx controls because the agency relied on entirely different precedents in the proposed and Final Rules for deciding what dollars-per-ton values are reasonable, and because EPA myopically focused on incremental costs instead of putting those costs in proper context. In particular, the Final Rule veers drastically from the proposal in that now it rejects the cost-effectiveness values that the agency had considered reasonable for NOx controls in 2023's Good Neighbor Plan. 88 Fed. Reg. 36654, 36746 (June 5, 2023). In the proposal, the agency relied primarily on this rule as a relevant precedent for determining the range of reasonable cost-per-ton values when evaluating options to reduce NOx emissions. EPA's primary basis for rejecting this precedent is a flawed interpretation of *Ohio v. EPA*, 603 U.S. 279, 292–94 (2024), 91 Fed. Reg. at 1933, a Supreme Court decision that stayed the Good Neighbor Plan for reasons unrelated to its cost-effectiveness evaluations. Nowhere in the proposal did EPA cite *Ohio* or otherwise indicate that the decision had any bearing on the cost-effectiveness values of NOx controls. *See generally* 88 Fed. Reg. 101306.

Furthermore, in the Final Rule, EPA cites approvingly to the cost-effectiveness determinations for NOx controls that appear in two prior rulemakings: the 2006 NSPS for industrial, institutional, and commercial boilers and the 2012 approval of North Dakota's state implementation plan under the regional haze program.[29] Yet the agency cited neither of these prior rulemakings in the proposal. *See generally* 88 Fed. Reg. 101306. Still worse, EPA seemingly and without explanation treats the calculations in those rules as absolute thresholds rather than points of comparison. For these reasons, and because this issue is of central relevance to the rule due to its impact on the stringency of the standards, EPA should grant reconsideration on the issue of its cost-effectiveness determinations.

EPA's new cost-effectiveness reasoning is arbitrary and capricious. First, as discussed above, EPA cites its 2012 approval of North Dakota's 2012 Regional Haze plan, which determined that NOx controls that cost $12,000/ton were not reasonable. 91 Fed. Reg. at 1933. Yet unlike section 111, the Clean Air Act's Regional Haze Program is designed exclusively to protect scenic visibility in Class-1 protected areas such as National Parks rather than the full range of human health and welfare impacts recognized in section 111. Section 111 and Regional Haze serve different ends. EPA has not justified why it may use an approval of a Regional Haze SIP to set a precedent for a section 111 standard nearly 15 years later. This alone is arbitrary and capricious.

Second, EPA has unjustifiably rejected the proposal's reliance on the cost-effectiveness evaluations performed in the 2023 Good Neighbor Plan. As explained at proposal, in the Good Neighbor Plan, the agency determined that SCR retrofits that cost approximately $14,000/ton in 2024 dollars were reasonable, and that "costs on an individual unit basis may range higher than $20,000/ton on a unit specific basis and yet still be justified." 89 Fed. Reg. at 101326 (citing 88 Fed. Reg. 36654, 36746 (June 5, 2023)). Like the present rule, the Good Neighbor Plan is directed at reducing ground-level ozone pollution, and is the most recent and up-to-date prior determination EPA made regarding the cost-effectiveness of NOx controls. Nonetheless, EPA disclaimed any

[29] *Supra* Section II.B.i.

reliance on the Good Neighbor Plan in the Final Rule, citing the Supreme Court's judgment in *Ohio*, 603 U.S. at 292–94, staying the rule during the pendency of litigation. 91 Fed. Reg. at 1933. EPA itself acknowledges that the Supreme Court's stay was based on the "Agency's failure to consider *a different aspect of the problem*," yet nevertheless claims that "its opinion raised significant doubts about the adequacy of the EPA's analysis and engagement with comments received," and so justifies discarding the cost-effectiveness values used in that rule to identify economically reasonable control technologies. *Id.* (emphasis added).

This is patently untrue. *Ohio v. EPA* found fault in one - and only one - aspect of the Good Neighbor Plan: EPA had designed a federal implementation plan that was specifically tailored to the emission profiles of 23 states, yet failed to recalibrate the plan after approximately half of those states were excluded from the federal program as a result of circuit court rulings staying EPA's disapproval of their *state* implementation plans. *Ohio*, 603 U.S. at 285-90, 292-94. Because the agency had not analyzed this issue, nor responded adequately to comments that raised it, the Supreme Court held that EPA was unlikely to prevail on the merits of a court challenge and thus issued a stay. Nowhere did the court cast doubt on the *general* "adequacy of the EPA's analysis and engagement with comments received" in the Good Neighbor Plan, 91 Fed. Reg. at 1933, nor did it call into question in any way the agency's determination that $14,000/ton (converted into 2024 dollars) was a reasonable value for NOx controls. *Id.* The agency thus has no basis to rely on *Ohio v. EPA* in rejecting the Good Neighbor Plan's evaluation of cost-effectiveness.

EPA additionally states that "[b]ecause the Good Neighbor Plan was never implemented and its assumptions about cost reasonableness were not tested in the real world, we do not believe the cost analysis in that rule is entitled to significant weight as a regulatory precedent." 91 Fed. Reg. at 1933. However, the question of whether NOx control costs of $14,000/ton (and in some cases above $20,000/ton) are, in fact, reasonable does not at all depend on whether the Good Neighbor Plan was "tested in the real world." Rather, it reflects EPA's determination that the public health benefits of reducing NOx pollution justify those particular costs on a dollars-per-ton basis. It is true that on-the-ground implementation of the Good Neighbor Plan could plausibly, demonstrate that, at the rulemaking stage, EPA had either underestimated or overestimated the average real-world costs of SCR retrofits for regulated units; but any such outcome would not retroactively alter the agency's prior determination that $14,000/ton represented a reasonable amount of money to spend to achieve a certain level of health and environmental benefits.

Next, EPA claims that "the cost analysis in the Good Neighbor Plan assessed retrofit costs for coal units for the purpose of promoting attainment of the NAAQS and therefore does not directly translate to the situation here." *Id.* Ironically, the very rule that EPA cites for its determination that a lower value of $12,000/ton is *not* reasonable for achieving NOx reductions—the agency's 2012 approval of the North Dakota Regional Haze SIP—*also* assessed SCR retrofit costs for coal units, but—unlike the Good Neighbor Plan—did not even share section 111's statutory goal of improving public health.[30] If the Good Neighbor Plan is not sufficiently analogous to the NSPS

[30] *See* 77 Fed. Reg. 20894 (Apr. 6, 2012).

program to provide a relevant precedent for cost-effectiveness, then the North Dakota Regional Haze SIP is even less so. The agency goes on to argue that "more stringent standards may be appropriate under the specific set of facts presented in an individual permitting context than would be appropriate for a NSPS." 91 Fed. Reg. at 1933. This observation is irrelevant to the Good Neighbor Plan, which is not a source-by-source permitting program, but rather applies its cost-reasonableness determination broadly across all affected units.

EPA further notes that "more stringent standards, and greater associated costs, may be appropriate when necessary to meet statutory requirements for nonattainment areas." *Id.* By the same token, however, more stringent standards and greater associated costs may *also* be appropriate for new units (such as those subject to the NSPS) rather than existing units (such as those coal plants subject to the Good Neighbor Plan). Likewise, higher control costs, including when evaluated on a total cost or capital cost metric, may be justified for rules (such as the NSPS) that cover peaker plants that will operate more often in the summer months and thus during high-ozone season, rather than rules that cover more baseload units and fewer peakers (e.g., the Good Neighbor Plan).

Fundamentally, though, this issue turns on health-specific inquiries: the extent to which ozone nonattainment areas, or expected operations during ozone-heavy summer months, justify higher control costs depends on a finding of facts regarding the health benefits of ozone reduction under those circumstances. EPA has not provided any such analysis, and so cannot reject the Good Neighbor Plan's cost-effectiveness precedent on those grounds. For that same reason, the agency's final justification—that it "is in the process of reconsidering the Good Neighbor Plan, and as such, no longer believes this cost-per-ton figure should serve as an appropriate comparison point," *id.*—bears no weight. The Good Neighbor Plan, of course, had not been revised or rescinded as of the date of EPA's Final Rule, and it remains the Agency's most recent effort to determine cost-effectiveness values that are reasonable for reducing NOx reductions from closely related sources. And unless EPA can show *why* the Good Neighbor Plan's cost-reasonableness determinations are no longer an "appropriate comparison point" based on health-based evidence, it cannot support its reversal from the proposal.

Finally, it is evident that EPA cherry-picked past agency determinations—or, rather a single past determination from the 2012 North Dakota Regional Haze SIP—to justify a cost-reasonableness value for NOx controls that is as low as possible in terms of dollars-per-ton. 91 Fed. Reg. at 1933 & n.111. In multiple other prior cases, EPA relied on substantially higher dollars-per-ton values including estimates markedly higher than the Good Neighbor Plan's —to define what it considered to be economically reasonable NOx controls. To reject those now without explanation is arbitrary on its face.

Consider, for instance, EPA's 2011 study titled *The Benefits and Costs of the Clean Air Act from 1990 to 2020*.[31] As parts of its evaluation of Clean Air Act implementation costs for the three

[31] EPA, Office of Air and Radiation, *The Benefits and Costs of the Clean Air Act from 1990 to 2020: Final Report--Rev. A*, at 3-6 (Apr. 2011), https://www.epa.gov/sites/default/files/2015-07/documents/fullreport_rev_a.pdf. (submitted as attachment)

decades in question, EPA "limited the application of these known controls to those with an estimated cost not exceeding $15,000 per ton for PM and ozone precursors (i.e., SO2, NOx, and VOCs). The rationale for incorporating this threshold into the analysis is that controls more costly than $15,000 per ton may not be cost effective. Thus, local air quality agencies would seek reductions from other (unidentified) control measures."[32] This report's cost-reasonableness value of $15,000/ton appear to reflect 2006 dollars, which, adjusted to 2026,[33] amounts to approximately $24,600/ton—double the value that EPA characterized as a limit in the Final Rule.

Another example is the regulatory impact assessment for the 2015 ozone NAAQS.[34] There, EPA not only considered the health impacts of ozone (and thus NOx emissions), but was legally prohibited from considering anything *but* health impacts in setting the standard. *Whitman v. Am. Trucking Ass'ns*, 531 U.S. 457, 471(2001). The agency did, however, perform a regulatory impact analysis that reported the anticipated implementation costs for the new 70-ppm ozone NAAQS, even if it could not account for those costs in setting the appropriate level of the NAAQS. In that analysis, EPA evaluated the cost of achieving the ozone NAAQS by referencing controls up to $19,000/ton, explaining that "[w]e selected $19,000 per ton as the control cost value above which we would not apply additional identified NOx controls because controls above this value are not likely to be cost-effective."[35] In this case, EPA appeared to use 2011 dollars,[36] making its cost-reasonableness value nearly $28,000 in today's money—again, far higher than the agency's arbitrary cut point in the Final Rule and even in the Good Neighbor Plan. EPA's decision to focus on precedents that justify less stringent regulations while ignoring those that would support more substantial levels of control is arbitrary and capricious and merits reconsideration.

iii. Relative to EPA's proposal, the Final Rule drastically increases the cost estimates for installing and operating SCR at simple-cycle turbines without justification.

In the Final Rule, EPA reversed the proposal's finding that SCR-based standards are economically reasonable for many simple-cycle units (depending on size and/or utilization), now determining that SCR is *never* cost-reasonable for a simple-cycle turbine. Moreover, EPA relied on new and unnoticed reasoning to reach this determination. The proposal's cost estimates for SCR were based largely on rigorous, systemic research conducted by the National Energy Technology Laboratory (NETL). *See* 89 Fed. Reg. at 101327. The Final Rule also uses NETL for its baseline calculations of the cost-effectiveness values for SCR at simple-cycle units, but then significantly "adjusts" these values to account for non-systematic industry assertions that Petitioners could not have addressed or rebutted during the comment period. 91 Fed. Reg. at 1932. Among other flaws, EPA

[32] *Id.* at 3-6 & 3-7.
[33] This adjustment, as well as the one described in the next paragraph regarding the values used in the RIA for the 2015 ozone NAAQS revision, is based on the Bureau of Labor Statistics CPI Inflation Calculator, available at: https://www.bls.gov/data/inflation_calculator.htm.
[34] EPA, Regulatory Impact Analysis of the Final Revisions to the National Ambient Air Quality Standards for Ground-Level Ozone (Sept. 2015), https://www.epa.gov/sites/default/files/2016-02/documents/20151001ria.pdf (submitted as attachment)
[35] *Id.* at 4-6.
[36] *See id.*

asserts a novel "three-fold increase in capital costs as a bounding assumption," 91 Fed. Reg. at 1934. Because this was not properly noticed and goes to the central relevance of the rule, reconsideration is warranted.

In rejecting SCR as part of the best system for all small turbines, regardless of utilization levels, EPA gives undue weight to anecdotal, unsubstantiated evidence from industry commenters that (according to the agency) call into question its own cost-effectiveness analysis, which reflects system-wide data primarily culled from NETL. As EPA explains in the preamble to the Final Rule, "several industry commenters asserted that estimated SCR costs for large simple cycle turbines are far higher than the estimates derived from the EPA's primary data sources," and so the agency "assum[ed] the capital costs that could be experienced by some firms may be up to three times higher than [EPA's] estimates." 91 Fed. Reg. at 1934; *see also id.* at 1933 ("EPA finds commenters' information credible and representative, [which] suggests that actual costs could be as high as twice the EPA's derived costs. Consequently, the EPA's cost analysis for simple cycle turbines likely represents best-case scenario costs.").

In the rulemaking, EPA provides an Excel spreadsheet where it compares the results of industry cost estimates for SCR with those of NETL and finds that the industry estimates are 74 to 450 percent higher.[37] The industry achieves these results through different and wide-ranging assumptions as to the capital cost of SCR, the useful life of the unit, the capital charge factor, and the effectiveness of combustion controls (and hence, the input-loading to the SCR). In each of these instances, there is at least one factor that appears incorrect, or at least not broadly applicable. For example, one estimate assumes that the input loading to the SCR is 4-6 ppm *at all times* (including during low-load operations) and that emissions from the SCR are 2.5 ppm. These figures are in stark contrast to the 96 ppm emissions recognized by EPA as typical emissions during unconstrained operation at less than 75 percent of full load. If, in fact, EPA believes that combustion controls alone are capable of limiting emissions to 4-6 ppm at all times, it should establish the NSPS limit at that level for all units, but of course did not.

Unlike the NETL data that inform the agency's baseline cost calculations, the comments from companies or trade associations that EPA relies on are essentially anecdotal. A prominent example is the joint submission of the American Fuel and Petrochemical Manufacturers (AFPM), American Forest and Paper Association (AF&PA), and the American Petroleum Institute (API) (the Associations). In relevant part, this comment reads as follows:[38]

> Our members have prepared cost analyses that demonstrate SCR is not cost effective for certain projects involving industrial turbine installations or modifications. For example:

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[37] EPA, *NOx Mitigation Measures- Selective Catalytic Reduction and Combustion Controls for Combustion Turbines: Technical Support Documen*t (Jan. 2026), Dkt. No. EPA-HQ-OAR-2024-0419-0242, Attachment 1 ("NETL Detailed Costs SCR Jan 2026," "Comment Cost Comparison" tab), https://downloads.regulations.gov/EPA-HQ-OAR-2024-0419-0242/attachment_1.xlsx.

[38] Am. Fuel and Petrochemical Manufacturers, Am., Forest and Paper Assoc., and Am. Petroleum Inst., C*omments on EPA's Proposed Review of New Source Performance Standards for Stationary Combustion Turbines and Stationary Gas Turbines*, Dkt. No. EPA-HQ-OAR-2024-0419-0078, at 32 (Apr. 15, 2025), https://downloads.regulations.gov/EPA-HQ-OAR-2024-0419-0078/attachment_1.pdf.

- One LNG plant example from Alaska found that the cost effectiveness of SCR was between $22,000 and $28,000/ton for the project units (gas compressors and CO2 compressors) and determined BACT was installation of a DLE combustor to achieve 9 ppm NOx at 15% oxygen. SCR was also evaluated for power generation turbines and it was found to be $66,000/ton, so BACT was determined to be installation of DLE to achieve 9 ppm NOx at 15% oxygen. The details of the cost analyses were submitted to the permitting agency as confidential information.

- One member is required to install SCR on two Solar Titan 130 cogeneration turbines by the state of Utah as part of a SIP action with the following costs: installed capital costs of over $23 million, annual operating costs of almost $600,000, at a cost per ton of pollutant removed of over $39,000.

- One member performed a BACT analysis to evaluate application of SCR on a gas-fired Solar Mars 90S combustion turbine equipped with SoLoNOx. Quotes were solicited from three vendors. Total installed capital costs ranged from $2.2 million to $2.7 million, with annual costs ranging from $566k to $722k. The ranges of cost effectiveness was $26,980 to $34,380/ton. Installation of the SCR catalyst would have caused approximately 10 inches of water back pressure on the turbine and resulted in a horsepower loss of approximately 1.8 percent. The SCR system was not required as BACT because it was not cost effective. BACT was determined to be use of SoLoNOx to achieve 15 ppm NOx.

- A non-member permitted two simple cycle turbines around 207 MMBtu/hr each in Louisiana. BACT for NOx was to equip the units with DLN burners to achieve 9 ppm on a 30-day rolling average (not including startup/shutdown and tuning periods). SCR was rejected as economically infeasible at $23,000 per ton of NOx removed (2018 dollars).

These isolated instances are not sufficient to overcome the systemic data provided by NETL. First, many details of the projects which are necessary to determine their relevance are absent. For example, these instances don't discuss what regulatory program the units in question were operating under, what their assumptions were regarding part-load or low-temperature operations, what their expected utilization rates might be, what capital charge rate and unit useful life they assumed for the capital expenditures, and whether the SCR installations were at entirely new turbines or were instead retrofits. Second, only one of the four cited examples provides realistic equipment cost estimates for the SCR (between $2.2 and $2.7 million). The other examples estimate SCR equipment costs as large as the cost of the gas turbine itself, which is highly unlikely absent truly extenuating or unusual factors. For instance, with regard to the unit discussed in the second bullet, EPA's data on turbine prices indicates that the baseline hardware costs for the Solar

Titan 130 are $8.25.[39] Yet the Associations claim that the "installed capital costs" of just the SCR component at that turbine were over $23 million. This not only suggests that the example is highly unreliable, but also drives home the more general point that industry's comments cannot in any way supplant the broad-ranging and unbiased data gathered by NETL.

As for the third bullet listed above, the Louisiana permit cited in the comments allows the applicant to install and operate two large 207-MW simple-cycle turbines for 7,000 hours per year (each) and emit a combined 259.76 tons of NOx per year.[40] Notwithstanding the fact that the air quality modeling demonstrated that these emissions would cause an exceedance of the 1-hour NOx NAAQS, the Louisiana Department of Environmental Quality (LDEQ) determined that SCR was not cost-effective and chose a 9 ppm limit, with exclusions for up to 600 hours of startup and shutdown events in addition to the 7,000 "normal" operating hours.[41] This is in stark contrast to other analyses of large combustion turbines with very high capacity factors (87 percent). The permit states that the applicant based its cost estimate on figures provided to the applicant by others.[42] Yet there is no indication that LDEQ independently evaluated these data. Indeed, it appears the LDEQ may have been unaware that the 9 ppm DLNB system cannot function properly below a minimum load, in which situations the SCR unit would not only remain operable (provided it remains above a certain threshold temperature) but would achieve vastly greater emission reductions than when the DLNB were functional, thus achieving much greater cost-effectiveness values. Similarly, the permit for the Alaska unit described in the first bullet assumes 9 ppm performance from the DLNB at all times. There is no indication that the permitting authority considered the low-load and low-temperature limitations of DLNB.

The examples in the Associations' comment additionally undercut EPA's rationale for its Final Rule in several important ways. First, in three of these examples, the project demonstrates the ability to procure DLNB at less than 25 ppm—on both electric generation and mechanical drive combustion turbines. Second, the Utah project went forward with the SCR installation even with a projected cost-effectiveness of $39,000 per ton of NOx abated. To the extent that this value is accurate, it greatly undermines the agency's unsupported assumption that cost-effectiveness values of $12,000/ton are not reasonable, and is much more aligned with Petitioners' assertion that NOx controls are economically justified at values well above $20,000/ton—and potentially much higher. Third, it is also reasonable to assume that the Utah permitting authority followed applicable NSR permitting guidance respecting the use of "incremental cost calculation" and, having evaluated the applicant's submission in greater detail than EPA's, has considered it unreliable.

Fundamentally, EPA's attempt to effectively "hedge its bets" on this issue by assuming substantially higher SCR costs than its own data set showed is unjustified. EPA's baseline cost calculations reflect systemic, broadly representative data compiled primarily by NETL. By contrast, the industry comments in question are vague, unit-specific, unsubstantiated, and entirely

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[39] EPA, *Combustion Turbine Manufacturer Specifications*, Attachment 3 to *NOx Emission Rates Technical Support Document*, Dkt. No. EPA-HQ-OAR-2024-0419-0020 (Nov. 2024), available at https://downloads.regulations.gov/EPA-HQ-OAR-2024-0419-0020/attachment_3.xlsx.

[40] La. Dep't of Envtl. Quality, EDmS Doc. No. 11133852 (May 23, 2018), https://edms.deq.louisiana.gov/app/doc/view?doc=11133852.

[41] *Id.* at 7-8, 11-17.

[42] *Id.* at 17.

lacking in any evidence of replicability. To the extent that these industry examples are even applicable, it is far more likely that they represent worst-case scenarios than that EPA's NETL-based calculations reflect best-case scenarios. EPA has provided no basis other than its conclusory assertion that these industry examples are in any way "representative" of the industry as a whole. Particularly given the widespread application of SCR at new simple-cycle units—including at three-quarters of those cited in EPA's proposal—the idea that this technology cannot be adopted as the "best system" because of examples raised in comments is arbitrary and capricious.

III. EPA's Approach to Subcategorization in the Final Rule Is Arbitrary.

In the Final Rule, EPA significantly overhauled the structure of its regulatory subcategories relative to the proposal. Petitioners could not have anticipated the precise delineation of EPA's final approach to subcategorization, which—as described below—operates to lump together units that may have quite different cost-effectiveness profiles with regard to SCR. For instance, commenters could not have foreseen that EPA would eliminate altogether the intermediate-utilization subcategory, thus grouping units with 1 percent annual capacity factors together with units operating at 44 percent annual capacity factors. Nor did EPA indicate at proposal that it might fully eliminate the distinction between turbines with heat input ratings above and below 250 MMBtu/h, resulting in a huge subcategory that includes very small boilers (down to 51 MMBtu/h) with legitimately medium-sized units (up to 850 MMBtu/h).

In addition, nowhere did EPA signal in the proposal it considered subcategory determinations dependent on its ultimate choice of the BSER for units in each subcategory. This inverts how section 111 categories are intended to operate, in which the agency's subcategory determinations guide its selection of the best system and not the other way around. Yet in the Final Rule, EPA justified its elimination of the intermediate-utilization (20-40 percent) and medium capacity (250-850 MMBtu/h) subcategories based on the fact that it was not ultimately identifying SCR as the BSER for those units, so the distinctions were no longer necessary. Ultimately, the effect of the Final Rule's revised structure of subcategories is to greatly diminish the cohort of sources subject to SCR-based standards, which is a drastic and unanticipated departure from the proposal.

In effect, EPA's Final Rule deploys a regulatory version of gerrymandering, lumping together units for which adding SCR is relatively more costly on a dollars-per-ton basis (i.e., large simple-cycle units) with units for which adding SCR is considerably less expensive (i.e. medium-sized, intermediate-utilization combined-cycle units), and then setting lenient NOx limits based on the former cohort of turbines in order to accommodate the entire subcategory. This is most clear in the agency's decision to subcategorize units based on capacity rather than simple-cycle/combined-cycle configuration. Even though EPA acknowledges that SCR is more cost-effective at combined-cycle units, and results in output-based emission rates that are approximately 30 percent lower, it nonetheless declines to provide distinct subcategories for combined vs. simple-cycle units on the grounds that such distinctions "are already effectively accounted for by the utilization subcategories." 91 Fed. Reg. at 1929. This is untrue: even while simple-cycle units do, on average, operate at lower capacity factors than combined-cycle units, there is nonetheless substantial

overlap in the utilization profiles of simple-cycle and combined-cycle units. Indeed, many combined-cycle units operate at capacity factors below the 45-percent threshold for "high utilization" units, (including at capacity factors down to 10 percent or even lower), and many simple-cycles operate at higher capacity factors, including in baseload applications.

As a result, many combined-cycle units will be subject to emission standards that are based on the cost-effectiveness and feasibility of reducing NOx from higher-polluting simple-cycle turbines. As discussed in Section II.A above, EPA's own data show that combined-cycle units constituted over 80 percent of large turbines operating in 2023 at annual capacity factors between 20 and 45 percent and over 60 percent at large units operating between 10 and 45 percent. Yet EPA's cost-effectiveness analysis assumes that *all* units operating at annual utilization rates below 45 percent are simple-cycle. This is a perfect example of how EPA's failure to subcategorize based on simple-cycle/combined-cycle configuration effectively "gerrymanders" one kind of unit into a more leniently-regulated subcategory without any justification. Of course, Petitioners assert that SCR *is* broadly cost-reasonable for the vast majority of simple-cycle turbines as well; yet under the agency's chosen approach, it cannot justify ignoring the distinction between combined-cycle and simple-cycle units, particularly where cost-effectiveness is the sole (or at least overwhelming) justification for excluding SCR from the "best system" determination for all but large, high-utilization turbines.

Similarly, EPA should reverse the merger of the mid-size (>250<850 MMBtu/h) subcategory with the small units (<250 MMBtu/h category). In doing so, EPA lumps most popular aeroderivative units currently meeting 3 ppm limits with smaller, more inefficient peakers. This results in a single subcategory that includes all of the following:

- Simple-cycle units with heat input ratings below 250 MMBtu/h, with an average heat rate of 12,390 Btu/Kwh (equal to 32.1 percent efficiency);
- Simple-cycle units with heat input ratings between 250 and 850 MMBtu/h, with an average heat rate of 9,713 Btu/kWh (equal to 38.9 percent efficiency); and
- Combined-cycle turbines below 850 MMBtu/h with heat rates as low as 5,500 Btu/kWh (equal to 61 percent efficiency).

EPA provides no compelling reason for eliminating the mid-size subcategory. As with its decision to scrap the proposed rule's intermediate utilization subcategory (i.e., covering units with utilization rates between 20 and 40 percent), the agency simply asserts that because it is "not determining that SCR is the BSER for any units smaller than 850 MMBtu/h," there is "therefore no reason to define the boundary between small and medium combustion turbines at 250 MMBtu/h." 91 Fed. Reg. at 1920. Again, this is inverted logic: the reason EPA has decided against including SCR-based requirements for any units below 850 MMBtu/h is precisely *because* (at least in part) it has "gerrymandered" all such units into a single subcategory for the purposes of determining cost-effectiveness. The same is true for its failure to distinguish between frame and aeroderivative turbines, which merit separate subcategories based on markedly different efficiencies.

EPA must also reconsider its decision in the Final Rule to provide a more lenient standard for large, low-utilization turbines that are "high-efficiency." Petitioners assert that all such units—or at least those with annual utilization rates above 10 percent—should be subject to SCR-based standards. In reality, purchasers of these turbine models typically equip them with SCR and meet NOx limits of 3 ppm. There is therefore no basis—including for reasons of cost—to exclude these sources from SCR-based requirements. Yet when considering the performance of DLNB at such units, the agency cannot justify establishing a 25-ppm standard for such units when "low-efficiency" counterparts are subject to 15 ppm.

EPA has created a special category for such "high-efficiency" turbines based on eight simple cycle combustion turbine models, each with a published efficiency greater than 38 percent. The agency justifies the 25 ppm standard based on the premise that "there is a tradeoff between efficiency and NO_x emissions such that some models of large higher efficiency turbines cannot meet a 15 ppm NO_x standard," claiming further that "[t]he most common way to increase the efficiency of a combustion turbine is to increase the firing temperature. However, an increase in firing temperature also results in increased formation of thermal NO_x." *Id.* at 1922. Here, the agency ignores other design factors apart from temperature that may be more important to unit efficiency, such as the number of turbine stages. Indeed, three of the eight models in this "high-efficiency group" operate at relatively low temperatures, and at least two of the units can be purchased in configurations that are guaranteed at 15 ppm. Similarly, numerous other models with "high" operating temperatures but lower efficiencies offer DLNB at less than 25 ppm.

Thus, the agency's basic claim—that higher efficiencies require higher temperatures, and that higher temperatures mean greater NO_x emissions—breaks down. Section 111 requires "*the best*" system of emission reduction. As the agency itself notes, only "*some* models of large higher efficiency turbines cannot meet a 15 ppm NO_x standard," *id.* (emphasis added), yet calibrating a standard to accommodate the *weakest*-performing units within a particular cohort falls short of section 111's mandate. Indeed, as EPA has often acknowledged in the past, Congress intended "that CAA section 111 would be significantly technology-forcing," and courts have affirmed this. 89 Fed. Reg. 39789, 39831 (May 9, 2024); *see Ruckelshaus*, 486 F.2d at 391 ("Section 111 looks toward what may fairly be projected for the regulated future, rather than the state of the art at present, since it is addressed to standards for new plants."). Given that high-efficiency turbines *can* meet 15 ppm based on DLNB—a fact EPA does not dispute—EPA must reconsider the rule to establish this limit as reflect the "best system" for such units, rather than set a standard that is based on the *worst*-performing units.

It is worth noting that, while EPA raised the issue of unit efficiency and its effect on NOx emissions in the proposal, it also observed that new large, high-efficiency turbines that might not satisfy the 2006 NOx NSPS's 15-ppm limit using combustion controls alone typically comply through the use of SCR. While the proposal went on to "solicit[] comment on whether combustion controls are being developed for the high-efficiency machines currently guaranteed at 25 ppm NOx that would reduce the guaranteed NOx emissions rate," 89 Fed. Reg. at 101333, nowhere did it suggest that it

might actually *weaken* the applicable NSPS in the Final Rule relative to the 2006 standard, nor did it indicate that the use of SCR for any such units unable to satisfy 15 ppm through combustion controls was not an appropriate requirement to establish in the Final Rule. Furthermore, EPA did not cite any legal authority (either in the proposed or Final Rule) indicating section 111 countenances the bizarre scenario in which older units in this subcategory (i.e., large high-efficiency turbines) are subject to a more stringent standard than identical newer units, or otherwise suggest that this outcome is permissible.

IV. The Final Rule Arbitrarily Weakens the NOx Standards for Large Modified and Reconstructed Units Relative to the 2006 NOx NSPS, and Arbitrarily Rejects SCR as the Best System for these Modified and Reconstructed Units.

In their rulemaking comments,[43] Petitioners could not have anticipated that EPA might weaken the standards for large (>850 MMBtu/h) modified and reconstructed turbines relative to the 2006 NOx NSPS, which have been in effect for 20 years. As discussed above with respect to the weakened standards for large, low-utilization, high-efficiency turbines, it is far from clear whether section 111(b) even permits this type of regulatory structure. Furthermore, whereas the proposal required SCR at various classes of modified and reconstructed units depending on size and utilization, the Final Rule exempts *all* modified and reconstructed turbines from SCR-based requirements, relying on industry assertions that were not raised in the proposal. Because of this, and because these issues affect the stringency of emission reductions required and are thus of central relevance, reconsideration is appropriate on this point.

Under the 2006 NOx NSPS, all new, modified, and reconstructed turbines with heat input ratings above 850 MMBtu/h are subject to a NOx limit of 15 ppm. *See* 40 C.F.R. Subpart KKKK, Table 1. Under the Final Rule, however, modified and reconstructed units that achieve efficiencies equal to or greater than 38 percent are granted a relaxed standard of 25 ppm, regardless of utilization level, of whether or not they were already in compliance with the 2006 standard, and whether they already have an SCR installed. Not only would a unit that modifies or reconstructs after the Final Rule's applicable date (December 13, 2024) receive a weaker standard than an identical unit that modifies or reconstructs before that date, but any existing unit that modifies n and ends up achieving efficiency of over 38 percent, including units subject to (and that had already been achieving) a 15-ppm limit under the 2006 standard, would qualify for a weaker standard, regardless of the actual modification's impact on efficiency. Similarly, an existing unit that already achieved an efficiency of 38 percent or higher would qualify for a weaker standard after modifying, even if the modification did *not* improve efficiency, and even if it already had been satisfying the 15-ppm standard for years.

As a legal matter, this is potentially unlawful under section 111, and could incentivize certain units to undertake small modifications in order to qualify for a substantially weaker standard, even if those units could easily satisfy the 15 ppm requirement after modification and regardless of whether they have an SCR already installed at the unit and can thus meet emission limits far lower

[43] *See id.* at 25-26, 80.

even than 15 ppm. In these scenarios, units could simply turn their SCR off and save on operation and maintenance costs, resulting in greater NOx emissions despite having the technology on site to achieve greater performance. This regulatory arrangement is arbitrary and capricious, and EPA must reconsider it.

Furthermore, whereas the proposed rule established SCR-based requirements for multiple cohorts of modified and reconstructed units (and, in fact, made no distinction between new and reconstructed units for the purposes of setting NOx limits), the Final Rule excludes *all* modified and reconstructed units from SCR-based limits. EPA rationalizes this major u-turn by referring to "comments that explained that many existing turbines undergoing modification or reconstruction face unique, site-specific challenges to retrofitting SCR, which can dramatically increase costs." 91 Fed. Reg. at 1918. First, these are precisely the kinds of anecdotal, unsubstantiated claims by industry we discussed above, which do not justify a sweeping decision that *no* modified or reconstructed units can install SCR in a cost-effective manner. The agency does not provide any data or analyses to back up these anecdotes, nor does it identify what the "unique, site-specific challenges may be," calculate anticipated cost increases, or demonstrate that any cost-increases would not justify SCR-based requirements for at least some units. Nor did EPA consider imposing SCR-based requirements on modified or reconstructed units that already had such technology installed beforehand. For these reasons, EPA's approach to modified and reconstructed turbines is arbitrary and capricious and should be reconsidered.

V. The Final Rule's Alternative Formulations of the Standard (the Four-Hour Average Output-Based Standard, the 30-Day Average Output-Based Standard, and the Annual Mass-Based Standard) Are Arbitrary and Capricious.

EPA's proposed rule provided an alternative output-based limit that operators could elect as a compliance option in lieu of the primary concentration-based limit or its input-based equivalent. Yet the proposal offered only a single output-based alternative limit using a 30-day averaging period. The Final Rule includes this option, but also adds two other alternatives: a four-hour average output-based standard and annual mass-based limits. While the agency solicited comment on different forms of an output-based standard, nowhere did it indicate that it might provide *all* of these rate formulations as compliance options, effectively giving sources a menu from which to select the least-stringent alternative (even while all are intended to be equivalent). Nor did EPA describe the particular calculations or methodologies it would use to derive each of these alternative output-based standards starting from the primary forms of the standard. Thus, Petitioners therefore had no meaningful opportunity to address EPA's alternative formulations. Because this structure is central to the rule's practical stringency, reconsideration is warranted.

In addition to the primary concentration-based standard, EPA provides four alternative versions of the applicable standard that operators may select as their compliance option. Each of these options provides a favorable compliance limit for a targeted subset of the population, including, for example an annual mass-based standard that may be more achievable for low-capacity-factor peaking units with a high ratio of startup and shutdown events , but then does not incorporate the effective emissions allowed under these alternatives in its cost-effectiveness calculations. The alternative standards are as follows:

- Heat input-based limits – 0.018 – 0.092 lb/MMBtu (5-25 ppm) based on a 4-hour average, 0.37 lb/MMBtu (96 ppm) limit for operation at less than 70 percent full rated load;
- Electrical output-based limits: 0.12 – 1.2 lb/MWh on a 30 operating day average depending on the category. Does not distinguish between low or high load or between simple cycle and combined cycle.
- 4-hour mass rate 0.83 lb NOx/MW-rated output for all.
- Annual mass rate 0.48 ton/MW-rated output for all.

Of these alternatives, the three output-based limits are problematic and should be reconsidered for the reasons discussed below.

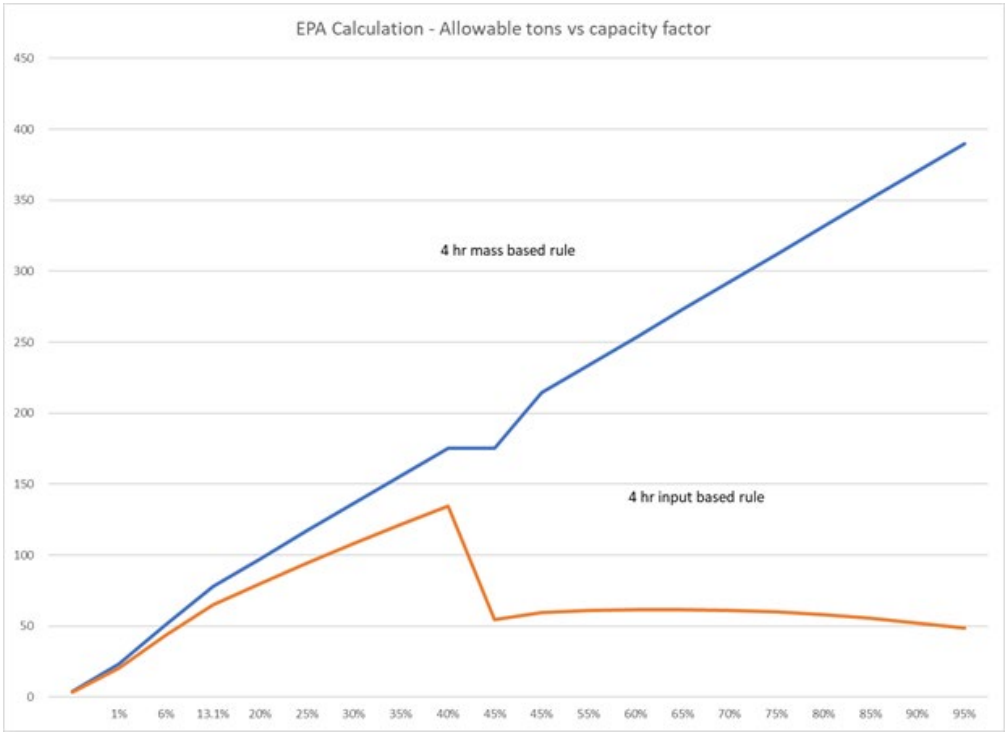
- **Electrical output-based limits (lb/MWh, 30-day average)**: This option (like each of the other compliance alternatives) is intended to be equivalent to the primary concentration-based limits. However, in actual application, its stringency varies widely depending on unit efficiency. To calculate these rates, EPA translates a unit's heat input (in terms of MMBtu/h) to its electricity output (MWh) assuming a fixed heat rate for *all* units based on operation of a fairly low-efficiency simple-cycle turbine. However, in practice, the heat rates of gas combustion turbines range from 6,667 Btu/KWh to 13,403 Btu/KWh (assuming full-load operations), with combined-cycle units typically between 20 and 30 percent more efficient than simple-cycle turbines. As a result, under this compliance option, combined-cycle units are permitted to emit up to 30 percent more NOx per unit of input (and thus more parts-per-million) than simple-cycle turbines accepting this option. There is no justification for this feature of the Rule, and EPA has not provided one. The agency must reconsider it, and must base each unit's equivalent output-based option on that unit's actual efficiency, rather than the erroneous one-size-fits-all approach adopted in the Final Rule.

- **Mass-based limit- annual (lb/MWh)**: This option provides an annual cap of 0.48 ton NOx/MW-rated output. The cap is calibrated in a way that would, if it were an *additional* requirement, effectively ensure that units do not partake in excessive part-load operations, during which periods their NOx emissions are, under EPA's approach, effectively uncontrolled. Under these circumstances, affected units would be disincentivized from operating at part-load, since doing so would consume more of the unit's fixed mass limit and thus potentially result in periods of mandatory shut-down. Thus, in the proposed rule, EPA solicited comment on whether it should establish "mass-based standards *in addition to* short-term emission rates to address any regulatory incentive for owners or operators to reduce operating loads so that the part-load standard is applicable." 89 Fed. Reg. at 101320 (emphasis added). Yet the Final Rule allows units to select this mass-based limit as the *sole* compliance option, which defeats its entire purpose. Because operators can now compare standards and determine which option is the least stringent, or the most likely to "reward" operations below 70 percent of load, the agency's proposed rationale for offering an annual mass cap is not only lost, but is in fact undercut. The agency must reconsider this approach and either eliminate the annual mass-based option or ensure that it is in

addition to an appropriately stringent short-term limit (or to a concentration- or input-based limit).

- **Mass-based limit- four-hour:** This option permits sources to emit 0.83 lb/MW averaged over a four-hour period. Thus, in contrast to a lb/MWh standard, this is a lb/MW-4h standard. As such, while it provides units with less flexibility than would the annual mass cap described above, the four-hour standard ultimately allows sources to emit up to 1817.7 lbs of NOx per year, nearly twice the emissions permitted under the annual mass-based standard.

  The following chart reflects data EPA provided in the record comparing the annual NOx emissions permitted under the four-hour mass limit versus the input-based standard, as applied to a hypothetical large (100-MW, 900-MMBtu/h) unit with 37.9 percent efficiency.[44] The x-axis depicts the unit's operations at a given annual capacity factor (also assuming a certain frequency of part-load operations at that capacity factor), while the y-axis depicts the NOx emissions permitted at that capacity factor/load profile. The blue line shows the NOx emissions allowed under the 4-hour mass-based limit and the red line shows the NOx emissions allowed under the 4-hour input-based limit.



[44] EPA, *NOx Emission Rates Technical Support Document*, Dkt. No. EPA-HQ-OAR-2024-0419-0240 (Jan. 15, 2026), Attachment 2 ("Combustion Turbine Manufacturer Specifications," "Mass Based Example" tab), https://downloads.regulations.gov/EPA-HQ-OAR-2024-0419-0240/attachment_2.xlsx.

As the chart shows, at very low annual capacity factors (which correspond to relatively high part-load operations), these two compliance options are largely equivalent. But above a capacity factor of approximately six percent, the lines start to diverge, with a dramatic separation occurring at the 45-percent threshold separating baseload units from lower-utilization turbines. The SCR-based requirement is clearly depicted in the line representing the input-based standard, and is virtually non-existent in the line representing the four-hour output-based standard. Thus, for large, high-capacity factor units—i.e., those turbines subject to SCR-based limits—the four-hour mass cap is *substantially* less stringent than the primary limit, allowing up to five times the annual emissions compared to the primary standard. EPA appears to have included this standard in part to allow turbines in the large, high-utilization subcategory to avoid having to install SCR, even though that technology is the designated as the "best system" for such units. EPA does not explain the need for this option and does not justify it other than to provide "flexibility" for operators. It must reconsider it and either exclude this option from the compliance alternatives or otherwise correct it to ensure full equivalence with the concentration and input-based limits.

VI. EPA Did Not Provide Adequate Justification for its Temporary Turbine Standard

In the Final Rule, EPA states for the first time that the "complexity" of SCR would "defeat the purpose of being able to bring in such turbines quickly." 91 Fed. Reg. at 1925. However, xAI installed SCR controls on temporary turbines in a matter of days to weeks; for instance, xAI equipped numerous Solar SMT-130 turbines with SCR in the span of a few weeks (at most) at its Mississippi site.[45] EPA further dismisses non-SCR technology that reduces emissions well below 25 ppm because these turbines are "less efficient and lower rated models." 91 Fed. Reg at. 1925-26. However, 35 MW GE 2500 series turbines are marketed as achieving 9 ppm without any add-on controls like SCR.[46] The 35 MW GE 2500 series turbines are quite common, and EPA has not demonstrated that portable turbines in regular use are rated significantly higher than 35 MW. As such, we dispute EPA's characterization that only "lower rated models" are capable of achieving NOx emission rates well below 25 ppm without SCR. Likewise, although rated at a more modest 16.5 MW, Solar SMT series turbines are likewise able to guarantee emission rates down to 9 ppm.[47] In light of the above, EPA should reconsider the temporary turbine standard and allow opportunity for comment on EPA's justification for the temporary turbine standar.d

VII. EPA Did Not Provide Adequate Notice for its Title V Exemption

A. EPA Did not Provide Notice That it Intended to Create an Exemption for Area Source Stationary Turbines Subject to the NSPS.

[45] Emails from Shannon Lynn, Trinity Consultants (consultant for xAI's MZX Tech affiliate), to Jaricus Whitlock, Mississippi DEQ (Sep. 6, 2025) (submitted as attachment). These emails show that as of August 18th, 2025, xAI had not installed any SMT-130s, but by September 6th, 2025, xAI had installed six of these turbines *with* SCR control construction completed.

[46] *See* Solaris Energy Infrastructure, Spec Sheet for 35 MW Turbine (powered by GE LM2500+G4), https://irp.cdn-website.com/f809ccf0/files/uploaded/Solaris_35MW_Turbine_Power_-_Tech_Specs-83f9c921.pdf (submitted as attachment)

[47] A Caterpillar Company, *Solar Turbines* (2024) https://s7d2.scene7.com/is/content/Caterpillar/CM20201215-9943b-379e0 (submitted as attachment)

EPA should also reconsider the Final Rule's adoption of a Title V exemption for stationary turbines that qualify as area sources. 91 Fed. Reg. 1959-60. EPA's decision to exempt these sources was a significant change from the proposed rule, which disclaimed any proposal to create new Title V exemptions. While EPA has the authority to exempt area sources from Title V permitting, the Agency has not established that complying with Title V would be "impracticable, infeasible, or unnecessarily burdensome" for stationary turbines. 42 U.S.C. § 7661a(a). Nor did EPA give interested parties adequate notice that it would adopt such an exemption as part of this rulemaking.

The proposed NSPS standards for stationary turbines included a call for comment "on whether it would be appropriate to exempt certain low-emitting stationary combustion turbines subject to [the NSPS standards] from title V permitting requirements." 89 Fed. Reg. at 101347. The purpose of this solicitation was "to better understand whether there are circumstances in which the burdens and costs of going through title V permitting . . . would not be justified" when compared with the purposes of Title V, including improving compliance, providing transparency about "the location and operation" of stationary turbines, and to ensure public participation in permitting decisions. *Id.* EPA put in the docket a memo from 2012 describing a "proposed section 502(a) exemption from title V permitting requirements for non-major stationary combustion turbines," which EPA never finalized, *id.*, but the proposed rule expressly stated that "EPA has not determined that title V permitting is 'impracticable, infeasible, or unnecessarily burdensome'" and that it was "*not proposing to exempt any such sources from title V permitting*." *Id.* (emphasis added).

In the Final Rule, EPA nonetheless included an exemption from Title V permitting for area sources "subject to subparts GG, KKKK, or subpart KKKKa." 91 Fed. Reg. at 1959. It drew the rationale for the exemption entirely from the 2012 Memo, notwithstanding that approximately 14 years have passed: It drew on a four-factor test used in that Memo (and drawn from an earlier exemption rulemaking), incorporated that Memo's "consider[ation] and balanc[ing]" of those factors, and instructed interested parties to "refer to that memorandum for a full explanation of our reasoning." *Id.* Despite that Memo being 14 years old, the Final Rule did not explain why or how EPA concluded that nothing had changed during that time, nor did it cite anything gleaned from the rulemaking record that led to that conclusion. *Id.*

The proposal failed to put interested parties on notice that EPA would adopt a Title V exemption in the Final Rule. Because EPA disclaimed its intent to exempt anyone from Title V, EPA's proposed rule did not articulate either "the factual data" or "the major legal interpretations and policy considerations" supporting such an exemption. 42 U.S.C. § 7607(d)(3)(A), (C); *see also* 5 U.S.C. § 553 (notice requirements under the APA). EPA's invitation to comment on the circumstances justifying Title V exemptions, when read alongside EPA's disclaimers, could not provide such a notice. That call for comments on the "circumstances in which the burdens and costs of going through title V permitting . . . would not be justified" was at best analogous to an advance notice of proposed rulemaking seeking information relevant to possible future rules. All that parties could know for sure is that EPA was *not* proposing to make such an exemption in the current proceeding, and so the notice manifestly did not put them on notice of EPA's change of course in the Final Rule. EPA may not, as it did here, "use the rulemaking process to pull a surprise switcheroo on regulated entities." *Env't'l Integrity Proj. v. EPA*, 425 F.3d 992, 996 (D.C. Cir. 2005); *see also Allina Health Servs. v. Sebelius*, 746 F.3d 1102, 1108 (D.C. Cir. 2014). EPA's

deficient notice of its intention to adopt Title V exemptions for these NSPS standards warrants reconsideration.

B. Had EPA Proposed to Exempt Area Source Stationary Turbines from Title V Permitting, Petitioners Would Have Provided Substantially Different Comments.

Petitioners seek reconsideration because EPA's revived 2012 Memo does not support the exemption that EPA actually adopted, and because the finalized exemption has no support in statutory text or further statutory purposes. Reconsideration is warranted so that Petitioners can address these defects. *See Ariz. Pub. Serv. Co. v. EPA*, 211 F.3d 1280, 1299 (D.C. Cir. 2000) ("[A] new round of notice and comment would provide the *first* opportunity for interested parties to offer comment that could persuade the agency to modify its rule.") (internal quotations omitted) (emphasis original).

Section 502(a) requires that operators obtain Title V permits for facilities subject to Clean Air Act regulations, but allows EPA "to exempt one or more source categories (in whole or in part) from" Title V permitting "if the Administrator finds that compliance with such requirements is impracticable, infeasible, or unnecessarily burdensome on such categories." 42 U.S.C. § 7661a(a). EPA exempted area source stationary turbines from Title V permitting for this NSPS because it concluded that permitting would be "unnecessarily burdensome." 91 Fed. Reg. at 1959. That conclusion was based on an *ad hoc* four-part test that EPA discussed in the 2012 Memo and borrowed from an earlier exemption rulemaking. *See* 2012 Memo at 1. That test considered: "(1) whether title V would result in significant improvements to the compliance requirements under subpart KKKK for the stationary combustion turbine NSPS non-major sources; (2) whether title V permitting would impose a significant burden on these non-major sources and whether that burden would be aggravated by any difficulty these sources may have in obtaining assistance from permitting agencies; (3) whether the costs of title V permitting for these non-major sources would be justified, taking into consideration any potential gains incompliance likely to occur for such sources; and (4) whether there are implementation and enforcement programs in place that are sufficient to assure compliance with subpart KKKK without relying on title V permits." *Id.* In the Final Rule, EPA did not analyze or discuss these factors in any detail but asserted that it had "specifically considered whether any information or analysis in that document is out of date," saying nothing more than that the Memo remained "applicable."

Even assuming that the four-factor test described in the Memo is the right one under section 502(a) (and it is not, as we explain below), EPA's conclusion that Title V permitting would not provide any added compliance benefit was wrong and overlooked differences in recordkeeping and monitoring requirements between the Final Rule and previous rules. For example, the 2012 Memo found that Title V would not provide additional compliance benefits because "[s]ubpart KKKK requires annual compliance demonstration tests, and the notification requirements of §60.8 ensure that the Administrator and delegated authorities are aware of tests and other events before they are performed to provide opportunity for observation." 2012 Memo at 2. However, both Subparts KKKK and KKKKa allow some facilities to conduct performance testing every 26 months, while Subpart KKKKa permits up to five years for some units. These are significant changes from the 2012 Memo and EPA did not consider (or explain) why Title V (which imposes more frequent testing requirements) would have no additional compliance benefit. EPA also relied on outdated assumptions about compliance burdens. In the 2012 Memo, EPA concluded that many small facilities would need Title V permits absent an exemption "based on the growing interest in using

natural gas-fired stationary combustion turbines for electric power generation, gas pipeline transmission, and CHP," and that "EPA anticipates a significant increase in the number of permit applications that permitting authorities would have to process each year." 2012 Memo at 2. But EPA did not finalize its Title V exemption in 2012, and the Final Rule does not consider whether this particular concern did in fact represent a compliance burden on small entities in the intervening fourteen years. Instead, EPA appears to have assumed that nothing changed since 2012.

Not updating the prior analysis was not EPA's only mistake. Its conclusion that Title V permitting will not have any additional compliance benefit is also wrong. Title V permits must include "enforceable emission limitations and standards," "a schedule of compliance," required monitoring reports at least every six months, along with "inspection, entry, monitoring, compliance certification, and reporting requirements to assure compliance with the permit terms and conditions." 42 U.S.C. § 7661c(a), (c). Yet air quality regulators do not have the same authority to require inspections and compliance certifications. Title V's public notice requirements also provide an additional compliance benefit, as public vetting of permit terms and conditions often results in more stringent requirements to ensure a facility meets air quality standards.

Additionally, the *ad hoc* four-part test that EPA uses to determine whether Title V compliance is "unnecessarily burdensome" does not reflect the best reading of that statutory phrase. *See Loper Bright Enterprises v. Raimondo*, 603 U.S. 369, 373 (2024). Determining whether complying with Title V permitting would be "unnecessarily burdensome" requires considering the full range of benefits that Title V permitting provides, comparing them with the corresponding burdens, and seeing whether those burdens are "unnecessary" in light of the benefits. EPA's test fails to consider the full range of benefits afforded by Title V, however.

First, it examines *only* so-called "compliance benefits" and fails to consider other benefits of Title V permitting that are at the core of the program. EPA acknowledged in the proposed rule that Title V's purposes also include "provid[ing] transparency to the public concerning the location and operation of stationary sources of air pollution, and . . . ensur[ing] public participation in the process of permitting the operation of such sources." 89 Fed. Reg. at 101,347. The 2012 Memo, incorporated by EPA as the rationale for this round of exemptions, did not acknowledge or consider the benefits of transparency and public participation. In addition to requiring prompt reporting of violations (a compliance benefit that adds to transparency), Title V affords opportunities for public participation when permit terms relevant to a stationary source are modified, and allows EPA objections to the Title V permit's renewal with opportunities for petitions to the EPA Administrator to object. A complete accounting of whether Title V compliance is "unnecessarily burdensome" would include these benefits.

Second, Title V permits also serve more comprehensive air pollution control efforts, as they "assure[] compliance by [sources] with all applicable requirements under the Clean Air Act. 40 C.F.R. § 70.1(b). States incorporate information and requirements from SIPs into Title V permits, and in turn state agencies and the public can more stringently monitor air quality plans based on those permit limits. EPA previously considered how exemptions would affect SIP plans in the context of NESHAP exemptions, *see* Exemption of Certain Area Sources From Title V Operating Permit Programs, 70 Fed. Reg. 75,320 (Dec. 19, 2005), but ignored the issue here.

Further comment on EPA's Title V exemptions is warranted. The objections that Petitioners seek to present in reconsideration proceedings, as outlined above, are of central

relevance to the rulemaking, and justify reconsideration of the rule. 42 U.S.C. § 7607(d)(7)(B); *see also Chesapeake Climate Action Network v. EPA*, 952 F.3d 310, 322 (D.C. Cir. 2020) (petitioners' issues are of central relevance if they "go to the very legality of the Final Rule[]").

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Petition submitted via certified and electronic mail. List of attachments submitted by certified mail to the Administrator and via electronic mail to the Administrator, Guatam Srinivasan, and John Ashley.

List of Attachments included with Petition:

Bryan Hubbell and Alan Krupnick, Resources for the Future, *How the Environmental Protection Agency Got it Wrong About Monetizing Benefits of Air Pollution Regulations* (2026), https://media.rff.org/documents/Report_26-04_-_Update_2.3.26.pdf.

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Harrington, Morgenstern, and Nelson, *On the Accuracy of Regulatory Cost Estimates,* J. Pol'y Analysis and Mgmt (2000)

U.S. EPA, S*upplementary Material for the Regulatory Impact Analysis for the Final Rulemaking, "Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review:" EPA Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances* (Nov. 2023), https://www.epa.gov/system/files/documents/2023-12/epa_scghg_2023_report_final.pdf.

U.S. EPA, *The Benefits and Costs of the Clean Air Act from 1990 to 2020: Final Report-- Rev. A* (Apr. 2011), https://www.epa.gov/sites/default/files/2015-07/documents/fullreport_rev_a.pdf.

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Emails from Shannon Lynn, Trinity Consultants (consultant for xAI's MZX Tech affiliate), to Jaricus Whitlock, Mississippi DEQ (Sep. 6, 2025)

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A Caterpillar Company, *Solar Turbines* (2024) https://s7d2.scene7.com/is/content/Caterpillar/CM20201215-9943b-379e0