PETITION FOR RECONSIDERATION OF EPA'S FINAL RULE: RESCISSION OF THE GREENHOUSE GAS ENDANGERMENT FINDING AND MOTOR VEHICLE GREENHOUSE GAS EMISSION STANDARDS UNDER THE CLEAN AIR ACT

Docket No. EPA-HQ-OAR-2025-0194

April 15, 2026

Via Email and Certified Mail

Environmental Defense Fund, Natural Resources Defense Council, Union of Concerned Scientists, Earthjustice, Sierra Club, Clean Air Task Force, Environmental Law & Policy Center, Conservation Law Foundation, Public Citizen, Physicians for Social Responsibility, Clean Wisconsin, Clean Air Council, American Public Health Association, American Lung Association, Center for Biological Diversity, and Alliance of Nurses for Healthy Environments, submit the following petition for reconsideration of specified aspects of EPA's Final Rule, Rescission of the Greenhouse Gas Endangerment Finding and Motor Vehicle Greenhouse Gas Emission Standards Under the Clean Air Act, 91 Fed. Reg. 7686 (Feb. 18, 2026).

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Environmental Defense Fund, Natural Resources Defense Council, Union of Concerned Scientists, Earthjustice, Sierra Club, Clean Air Task Force, Environmental Law & Policy Center, Conservation Law Foundation, Public Citizen, Physicians for Social Responsibility, Clean Wisconsin, Clean Air Council, American Public Health Association, American Lung Association, Center for Biological Diversity, and Alliance of Nurses for Healthy Environments (collectively "Petitioners"), hereby request that the U.S. Environmental Protection Agency ("EPA" or "Agency") reconsider specified aspects of the Final Rule titled "Rescission of the Greenhouse Gas Endangerment Finding and Motor Vehicle Greenhouse Gas Emission Standards Under the Clean Air Act," 91 Fed. Reg. 7686 (Feb. 18, 2026) ("Final Rule").

I. INTRODUCTION

On February 18, 2026, the U.S. Environmental Protection Agency ("EPA") published the Final Rule, which rescinds the Administrator's foundational and critically important 2009 decision entitled "Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act," 74 Fed. Reg. 66496 (Dec. 15, 2009) ("Endangerment Finding"), and repeals all greenhouse gas (GHG) emission standards for new light-duty (LD), medium-duty (MD), and heavy-duty (HD) vehicles and engines manufactured in or imported into the United States for model years (MY) 2012 to 2027 and beyond.[1]

EPA issued the Endangerment Finding under Clean Air Act section 202(a)(1) based on its exhaustively supported conclusion that GHGs endanger public health and welfare. The Agency found that emissions from new motor vehicles and engines "contribute" to "air pollution," defined as the accumulated global concentrations of the six "well-mixed" GHGs, that endangers public health and welfare by giving rise to climate change dangers.[2] As required under Clean Air Act section 202(a)(1), after making the requisite Endangerment Finding, EPA issued GHG emission standards for new motor vehicles and engines. EPA has adopted regulations updating its vehicle GHG emission standards multiple times over the past sixteen years, each time reaffirming the validity of the Endangerment Finding.

In an about-face, EPA now contends that the Endangerment Finding and subsequent mobile source GHG regulations exceeded the Agency's authority under Clean Air Act section 202(a)(1).[3] Numerous state and local governments, public health, environmental, and labor organizations, industry trade groups, and other parties—including the undersigned Petitioners—have filed timely petitions for review of the Final Rule in the U.S. Court of Appeals for the D.C. Circuit, and those cases are pending. *See American Public Health Association v. EPA*, Case No. 26-1037 (D.C. Cir. 2026) and associated cases.

Under Clean Air Act section 307(b)(1), parties challenging EPA rules must petition for judicial review of a rule within 60 days of the rule's publication in the Federal Register.[4] Section

[1] 91 Fed. Reg. at 7688.
[2] 74 Fed. Reg. at 66536-37.
[3] 91 Fed. Reg. at 7689.
[4] 42 U.S.C. § 7607(b)(1).

307(d)(7)(B) provides that if "it was impracticable" to raise an objection to an issue "of central relevance to the outcome of [a final] rule," a party must seek administrative reconsideration before raising those issues in judicial review.[5] As explained below, EPA's notice of proposed rulemaking failed to provide adequate notice as to the issues raised in this petition, and it was therefore impracticable for Petitioners to raise the objections presented herein during the public comment period.[6] The objections described in this reconsideration petition identify numerous and foundational flaws in EPA's rationales for the Final Rule that, if corrected, present a substantial likelihood that EPA would have reached a different outcome, and that are therefore centrally relevant to the outcome of the rule.[7] Pursuant to Clean Air Act section 307(d)(7)(B), and for the reasons set forth below, Petitioners hereby petition EPA to reconsider these aspects of the Final Rule.[8] To promote efficient resolution of disputes over the Final Rule, EPA should act swiftly on this petition, grant the requested reconsideration on the issues described herein, and reopen an opportunity for public comment on these issues.

We note that parties may have disputes over whether a particular objection was already exhausted or was subject to the reconsideration process outlined in Clean Air Act section 307(d)(7)(B), and that definitive judicial resolution of that uncertainty may come after the time for submitting the objection to the Agency has expired. Petitioners also note that section 307(d)(7)(B)'s exhaustion requirement is not jurisdictional and can be waived by the Agency.[9] Accordingly, Petitioners reserve the right to press the objections presented herein in their pending judicial challenges.

The balance of the petition begins in section II by articulating the standard for Clean Air Act section 307(d)(7)(B) reconsideration. Section III explains that EPA introduced entirely new modeling and *de minimis* theories in the Final Rule to support its futility finding, and recast futility as an independent basis for rescinding both the Endangerment Finding and all vehicle GHG standards, none of which was a logical outgrowth of the proposal. As such, commenters had no chance to scrutinize or rebut the undisclosed models, assumptions, and thresholds that now drive the agency's dispositive conclusions.

Section IV addresses the Final Rule's new technical futility analysis, which abandons the

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[5] *Id.* § 7607(d)(7)(B).

[6] Alternatively, EPA's Final Rule presents grounds arising after the comment period. This petition demonstrates that the objections herein meet both bases for mandatory reconsideration under Clean Air Act section 307(d)(7)(B).

[7] In support of this petition, we are also submitting several appendices, our modeling files, and additional documents, which provide supporting technical analysis for the objections raised herein. We further describe these submissions in section VIII.

[8] If EPA were to conclude that Clean Air Act Section 307(d)(7)(B)'s criteria for mandatory reconsideration are not met, EPA should still reconsider the Final Rule under Administrative Procedure Act section 553(e), 5 U.S.C. § 553(e), so that the serious errors and missteps identified herein are corrected.

[9] *EPA v. EME* Homer *City Generation, L.P.*, 572 U.S. 489, 511-12 (2014) (concluding that section 307(d)(7)(B)'s exhaustion requirement is not "jurisdictional," and proceeding to address merits of challengers' objections to rule, because EPA had failed to "unequivocally" press failure-to-exhaust argument in the D.C. Circuit).

proposal's reliance on the Climate Working Group (CWG) report and instead models the percentage contribution of all U.S. vehicle CO_2 emissions, beginning in Model Year (MY) 2027, to changes in global mean surface temperature (GMST) and global sea level rise (GSLR). EPA then reduces modeled impacts by 50% in a so-called "illustrative" scenario. Among other things, EPA errs in solely relying on global average temperature and sea level change metrics that obscure massive health and welfare harms to the United States, makes irrational modeling choices that assume the emissions benefits of the GHG program to assert that the same program is meaningless, and relies on a so-called "illustrative" scenario with back-of-the-envelope calculations that the Agency concedes applies "analytic tools not intended for this purpose."[10] This section details our objections to these modeling choices, and the dramatically different outputs that would result from different choices, showing the central relevance of EPA's failure to expose its new futility analysis to public scrutiny.

Section V addresses the Final Rule's new *de minimis* yardsticks—global temperature and sea level "measurability," global temperature "variability" for 2016–2025, and a 1% contribution threshold—against which EPA compares the global temperature and sea level rise impacts of U.S. vehicle GHGs. Petitioners demonstrate that EPA's measurability and variability assertions conflate entirely distinct technical concepts, rely on numbers that do not exist even in the Agency's cited sources, and make numerous basic statistical errors. EPA's third *de minimis* yardstick—a 1% contribution threshold—has no basis in judicial precedent and arbitrarily neglects the context of climate change, where a 1% contribution translates into catastrophic health and welfare damages.

Throughout sections IV and V, we also show that, after addressing EPA's numerous technical errors, U.S. vehicle emissions' impacts on temperature and sea level rise easily exceed EPA's alleged *de minimis* thresholds, in some cases by over an order of magnitude, making such impacts meaningful even under EPA's flawed futility methodology. For example, section V.A.2 reports potential sea level rise impacts nearly 36 times the amount of measurement uncertainty, and potential temperature impacts 24 times the amount of measurement uncertainty and nearly 14 times the amount of variability. Section IV.C.2 further demonstrates that, even assuming the Final Rule's modeling inputs, U.S. vehicle GHGs cause massive human health and welfare harms of $17.6 trillion by 2100, an amount that is not *de minimis* by any reasonable measure.

Lastly, Section VI addresses EPA's abrupt Final Rule decision not to monetize ozone and fine particulate matter ($PM_{2.5}$) co-benefits, which reverses longstanding practice without new science or adequate explanation and erroneously treats these critical public health benefits that reduce toxic soot and smog as worth zero dollars.

II. STANDARD FOR RECONSIDERATION

Clean Air Act section 307(d)(7)(B) provides:

> Only an objection to a rule or procedure which was raised with reasonable specificity during the period for public comment (including any public hearing) may be raised during judicial review. If the person raising an objection can demonstrate to the Administrator that it was impracticable to raise such objection

[10] 91 Fed. Reg. at 7732.

> within such time or if the grounds for such objection arose after the period for public comment (but within the time specified for judicial review) and if such objection is of central relevance to the outcome of the rule, the Administrator *shall* convene a proceeding for reconsideration of the rule and provide the same procedural rights as would have been afforded had the information been available at the time the rule was proposed.[11]

Employing the mandatory "shall," the section *mandates* that EPA convene a reconsideration proceeding upon the required demonstration. A fundamental purpose of the reconsideration process is to grant the public an opportunity to timely comment on important aspects of a Final Rule that were not properly noticed in a proposed rule.[12]

For rulemakings such as the Final Rule, section 307(d)(3) of the Clean Air Act requires EPA to provide notice of its proposed action that "shall be accompanied by a statement of its basis and purpose," including "the factual data on which the proposed rule is based; ... the methodology used in obtaining the data and in analyzing the data; and ... the major ... policy considerations underlying the proposed rule."[13] These notice requirements are designed "(1) to ensure that Agency regulations are tested via exposure to diverse public comment, (2) to ensure fairness to affected parties, and (3) to give affected parties an opportunity to develop evidence in the record to support their objections to the rule and thereby enhance the quality of review."[14] "[I]f the Final Rule deviates too sharply from the proposal, affected parties will be deprived of notice and opportunity to respond to the proposal."[15] "[A]mbiguous comments and weak signals from the Agency g[i]ve petitioners no . . . opportunity to anticipate and criticize the rules or to offer alternatives. Under these circumstances, the … rules exceed the limits of a logical outgrowth."[16] Therefore, considering the purposes of notice, a final rule that is not the logical outgrowth of a proposed rule does not provide the public with meaningful notice under section 307(d)(3).[17] And critically for purposes of this petition, objections to aspects of a final rule that did not grow logically from the proposed rule are, necessarily, ones that were "impracticable to raise" or the grounds for which arose only after the public comment period. Even if EPA's conclusion were a logical outgrowth of the proposal, findings and analyses underlying the conclusion that were not disclosed in the proposal are the proper subject of mandatory reconsideration.[18]

An objection is of central relevance if it "provides substantial support for the argument that

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[11] 42 U.S.C. § 7607(d)(7)(B) (emphasis added).

[12] Furthermore, EPA has discretion to reconsider its actions even where the standard for mandatory reconsideration is not met.

[13] 42 U.S.C. § 7607(d)(3).

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[14] *Envt'l Integrity Project v. EPA*, 425 F.3d 992, 996 (D.C. Cir. 2005) (quoting *United Mine Workers of America v. Mine Safety & Health Admin.*, 407 F.3d 1250, 1259 (D.C. Cir. 2005).

[15] *Small Refiner Lead Phase-Down Task Force v. EPA* ("*Small Refiner*"), 705 F.2d 506, 547 (D.C. Cir. 1983).

[16] *United Mine Workers of America*, 407 F.3d at 1261 (citation omitted).

[17] *See Env't Integrity Project*, 425 F.3d at 996-97.

[18] *Chesapeake Climate Action Network v. EPA*, 952 F.3d 310, 320-21 (D.C. Cir. 2020).

the regulation should be revised."[19] An objection that "go[es] to the very legality" of the Final Rule satisfies this test,[20] even if EPA could conceivably claim alternative support for its action.

III. RECONSIDERATION IS MANDATED

Reconsideration under Clean Air Act section 307(d)(7)(B) is mandated here because Petitioners raise multiple objections, as detailed in this petition, that were impracticable to raise during the comment period because they were not noticed in the Proposal, and they concern issues of central relevance to the Final Rule. In particular, Petitioners object to EPA's reliance on modeling and technical analyses that EPA performed *after* the period for public comment on the proposed rule, and that underpin EPA's bases for rescinding the Endangerment Finding and associated vehicle GHG emission standards. Petitioners did not have an opportunity to assess and object to these new technical methodologies and analyses, and resulting findings and conclusions, during the public comment period, and indeed, could not possibly have done so given that they became available only after the close of the comment period. EPA also articulates certain novel legal and policy justifications for the first time in the Final Rule as to repeal of the Endangerment Finding and the vehicle GHG emission standards based on new futility analyses and *de minimis* metrics. Finally, EPA takes the position for the first time in the Final Rule that it cannot monetize health co-benefits associated with ozone and $PM_{2.5}$ reductions.

As described further in this petition, these justifications for repeal were not properly noticed. When information such as new modeling and findings are made available for the first time in a final rule, the "the [Clean Air] Act provides an orderly process for raising objections that a party had no opportunity to press during the public comment period."[21] Additionally, Petitioners' objections to these issues are of central relevance as they directly challenge the legality of the Final Rule.[22] If EPA had properly noticed these issues for public comment, commenters would have identified critical modeling flaws, analytical inconsistencies, unsupportable assumptions, and other objections to EPA's analysis and methodologies. There is a substantial likelihood that public input would have affected EPA's final findings and rationales regarding rescission of the Endangerment Finding and all vehicle GHG emission standards based on futility and new *de minimis* metrics, all of which are centrally relevant to the Final Rule. EPA must therefore convene a Clean Air Act section 307(d)(7)(B) proceeding for reconsideration as the forum for the public to evaluate such new modeling and analyses that are at the heart of the Final Rule.

Furthermore, the Final Rule's new justifications for rescinding the Endangerment Finding and the vehicle GHG standards are based on entirely new modeling results, technical analyses, and policy positions that are not the logical outgrowth of analysis presented in the proposed rule. Particularly, EPA claims that it performed this new modeling "to evaluate the competing data and

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[19] *Coal. for Responsible Regul. v. EPA*, 684 F.3d 102, 125 (D.C. Cir. 2012), *aff'd in part, rev'd in part on other grounds sub nom. Util. Air Regulatory Grp. v. EPA*, 573 U.S. 302 (2014) (citation omitted).
[20] *Chesapeake Climate Action Network*, 952 F.3d at 322.
[21] *Masias v. EPA*, 906 F.3d 1069, 1075-76 (D.C. Cir. 2018).
[22] *Chesapeake Climate Action Network*, 952 F.3d at 322.

conclusions received" during the comment period.[23] But EPA cannot claim that its new futility modeling is a logical outgrowth of the proposal, which contained no such modeling; therefore, commenters could not have anticipated the new modeling based on what was proposed. Nor can EPA lean on analyses submitted by commenters to establish that its own late modeling is a logical outgrowth.[24] The petitioners seeking reconsideration here had no timely notice of or opportunity to comment on analyses submitted by other commenters, nor on the Agency's own analysis performed only after the comment period and made public only with the Final Rule.[25] As EPA itself asserts in the Final Rule Response to Comments, "the public comment period is intended to offer an opportunity to respond to the issues raised in the Agency's proposal and supporting materials rather than to the content of other public comments."[26] Adequate notice requires instead that alterations in the Final Rule be something parties should have anticipated based on the proposal itself.

As clearly demonstrated throughout this petition, mandatory reconsideration would provide Petitioners the required period for public comment to critique the new modeling and analyses, and the new *de minimis* metrics, all of which are at the heart of the Final Rule's futility finding and related arguments. Accordingly, EPA is required to provide notice of and an opportunity to comment on its new modeling and consequent findings, and on the propositions in the Final Rule that rely on such modeling and findings. EPA must also provide an opportunity for comment on its new position that it cannot monetize ozone and $PM_{2.5}$ co-benefits associated with the vehicle GHG standards, as that position is fundamental to EPA's new conclusion that retaining the standards is unreasonable.

IV. THE FINAL RULE RELIES ON ENTIRELY NEW TECHNICAL ANALYSES TO SUPPORT ITS FUTILITY ARGUMENTS, AND SUCH TECHNICAL ANALYSES ARE FATALLY FLAWED.

EPA's futility rationales are premised on novel technical analysis of projected impacts of U.S. vehicle GHG emissions on Global Mean Surface Temperature (GMST) and Global Sea Level Rise (GSLR),[27] which we describe in this petition with shorthand such as global temperature and

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[23] 91 Fed. Reg. at 7691.

[24] *Small Refiner*, 705 F.2d at 547-549 ("As a general rule, EPA itself must *itself* provide notice of a regulatory proposal. Having failed to do so, it cannot bootstrap notice from a comment." (emphasis in original)).

[25] And even if the standard for evaluating whether EPA satisfied its statutory notice requirement included consideration of the content of public comments on the Agency's proposal (which it does not), EPA's new modeling is still not properly noticed because it provides for the first time modeled impacts on at least one metric, Global Sea Level Rise, that was not addressed by any commenter's modeling. EPA, Rescission of the Greenhouse Gas Endangerment Finding and Motor Vehicle Greenhouse Gas Emission Standards Under the Clean Air Act: Response to Comments ("RTC") at 217.

[26] RTC at 10.

[27] *See* 91 Fed. Reg. at 7728-34; EPA, Technical Memo on: Temperature, CO_2 Concentration, and Sea Level Rise Impacts of Greenhouse Gas Emissions from U.S. Motor Vehicles for the "Rescission of the Greenhouse Gas Endangerment Finding and Motor Vehicle Greenhouse Gas Emission

global sea level rise.[28] This new analysis incorporates numerous data, methodologies, models, assumptions, policy choices, factual findings, and other changes, which are new to the Final Rule.[29] Specifically, the Agency purports to calculate the changes in global temperature and sea level rise attributable to U.S. vehicle GHG emissions as percentages of total global anthropogenic impacts over specific time periods.[30] EPA also advances a so-called "illustrative" scenario that arbitrarily reduces modeled impacts by 50%.[31] Finally, EPA compares these percentages against three novel *de minimis* yardsticks : (i) the "range of measurability" of global temperature and sea level rise, (ii) global temperature "variability" from 2016-2025, and (iii) a 1% contribution threshold that EPA asserts courts have "consistently viewed" as *de minimis*.[32] The Agency then asserts that the impacts are so small as to be *de minimis* when measured against any of these yardsticks.

In section IV.A below, we demonstrate that EPA introduced the above analysis for the first time in the Final Rule—depriving the public of any notice and opportunity to comment on those issues—and that such analysis provides foundational technical support for the Agency's factual determinations as to futility.[33] We also explain that many objections raised in the comments remain relevant to the final futility analysis and provide context for the objections raised herein.

In sections IV-V, we advance three independent sets of objections of central relevance. Each of our objections reinforces the substantial likelihood that EPA's analysis and conclusions would have changed had the public been afforded the statutorily required notice and opportunity to comment on the differing inputs, assumptions, and methodologies presented in the final futility analysis. First, section IV.B shows that EPA's new modeling of U.S. vehicle emissions, global temperature, and global sea level rise is highly sensitive to modeling parameters, and EPA's choice of parameters is flawed in numerous ways. Section IV.C, in turn, presents modeling results addressing those flaws and showing significantly higher global temperature and sea level rise impacts attributable to U.S. vehicle GHG emissions. That section also illustrates the massive health and welfare impacts projected to result from the U.S. vehicle GHG emissions that EPA evaluated.

Second, section IV.D demonstrates that EPA's supposedly "illustrative" 50% scenario is actually critical to the Agency's futility finding. Without this arbitrary reduction, EPA's own model results would exceed even its stated 1% *de minimis* threshold. But even applying this reduction, the vast majority of modeled scenarios exceed the 1% *de minimis* threshold.

Third, section V explains that all of EPA's new *de minimis* thresholds are inappropriate for

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Standards Under the Clean Air Act" Final Rule, Docket No. EPA-HQ-OAR-2025-0194-31105 ("EPA Temperature Memo").

[28] We also use as shorthand related terms such as "temperature," "global average temperature," "sea level," "average sea level rise," "global average sea level."

[29] In this section, we generally use the terms "analyses" and "analysis" to refer to some or all of these novel additions.

[30] 91 Fed. Reg. at 7728-32; *see generally* EPA Temperature Memo.

[31] 91 Fed. Reg. at 7732.

[32] 91 Fed. Reg. at 7732-33.

[33] The introduction of these materials in the Final Rule also violates section 307(d)(3)'s mandate that proposal include "the factual data on which the proposed rule is based" and "the methodology used in obtaining the data and in analyzing the data." CAA section 307(d)(3)(A)-(B).

assessing the materiality of reducing U.S. vehicle GHG emissions. Section V.A explains that EPA's new measurability and variability thresholds are conceptually irrelevant and numerically erroneous. Addressing the flaws in how EPA determined these thresholds as well as EPA's modeling of temperature and sea level impacts, we find that the impacts of U.S. vehicle GHGs exceed the thresholds, in some cases by more than an order of magnitude. Section V.B shows that EPA's 1% threshold has no basis in the caselaw and is arbitrary.

A. EPA relies on new technical analyses of climate change metrics not found in the proposal.

EPA's proposed repeal alleged that regulating GHG emissions of U.S. vehicles is futile because those emissions represent a small percentage of the global total and that reducing them in isolation would have no meaningful impact on climate change dangers. The proposal relied solely on the report of the Climate Working Group (CWG) to support this rationale.[34] Based on 2022 data, the proposal asserted that eliminating GHG emissions from light- and medium-duty vehicles would result in a 1.8% decrease in global GHG emissions, which allegedly correspond to "an approximate 3 percent reduction in predicted warming trends."[35] By contrast, EPA alleged that "[g]lobal warming trends from 1979 to 2023, the period with the best available data, were determined to a precision (or margin of error) of plus or minus 15 percent total. An estimated 3 percent reduction in global warming trends is well below the scientific threshold for measurability and is not a reliable measure for regulatory purposes."[36] EPA then made similar claims for heavy-duty vehicles, and all U.S. vehicles in the aggregate. EPA did not clearly explain what global warming trends it was concerned about with respect to futility, using differing formulations throughout the preamble such as "GHG emission concentrations or global warming potential,"[37] "GHG concentrations in the atmosphere or the rate of global climate change," or simply "[g]lobal warming trends."[38]

In the Final Rule, EPA still attempts to justify its rescission of the Endangerment Finding and all vehicle GHG emission standards based on futility. However, the Agency's methodology for determining that vehicle GHG emission standards are futile and its resulting futility finding are entirely new. In direct contrast to the proposal, EPA claims to no longer rely on the CWG report "for any aspect of [its] final action,"[39] following a federal court decision finding that the CWG report was secretly created in violation of the Federal Advisory Committee Act.[40] The Final Rule's futility

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[34] *See* Reconsideration of 2009 Endangerment Finding and Greenhouse Gas Vehicle Standards, 90 Fed. Reg. 36288, 36311-12 (proposed Aug. 1, 2025) (citing 2025 CWG Draft Report at 130).
[35] 90 Fed. Reg. at 36311.
[36] *Id.* Based on these factual allegations, EPA also proposed to find that there was no "requisite technology" under CAA section 202(a)(2), 90 Fed. Reg. at 36312, a basis which the Agency did not finalize.
[37] 90 Fed. Reg. at 36305.
[38] 90 Fed. Reg. at 36311.
[39] 91 Fed. Reg. at 7691 n.8.
[40] *See* Judgment, EDF v. Wright, No. 1:25-cv-12249-WGY, Doc. No. 99 (D. Mass., Jan. 30, 2026), https://library.edf.org/AssetLink/j0s1oj2lwi027ldk6y45xnnx3353t1y2.pdf. EPA's recent public statements, however, suggest that the conclusions of the CWG report continue to undergird the Agency's conclusions concerning the Endangerment Finding. *See* The Heartland Institute, *Lee Zeldin*

analysis also abandons the proposal's reliance on 2022 U.S. vehicle emissions data from the Inventory of U.S. Greenhouse Gas Emissions and Sinks.[41]

Instead, the Final Rule advances new modeling of vehicle emissions, global temperature, and global sea level rise, using four models (MOVES, OMEGA, FaIR, and BRICK) and an emissions scenario representing all U.S. vehicle CO_2 emissions beginning in MY2027.[42] While the proposed rule used MOVES and OMEGA modeling to estimate the regulatory impacts of the rule pursuant to Executive Order 12,866,[43] the Final Rule deploys these models for the entirely different purpose of supporting its futility rationale.[44] To that end, the Final Rule applies these models to a scenario involving *all* U.S. vehicle CO_2 emissions beginning in MY2027, as opposed to the repeal of certain emission standards.

The Final Rule also presents for the first time an "illustrative" scenario that reduces emissions, global temperature, and global sea level rise impacts by 50% from its modeled scenario. Further, EPA compares global temperature and sea level rise metrics to three new alleged *de minimis* thresholds: (i) the "range of measurability" for global temperature and level rise, (ii) global temperature "variability" from 2016-25, and (iii) a 1% *de minimis* threshold it claims has been recognized by courts. The Agency then claims *de minimis* impacts based on each of these

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defends 'controversial' record as head of EPA at Heartland Institute Climate Conference, YouTube (Apr. 8, 2026) https://www.youtube.com/watch?v=aZbsZi7Eybk (Administrator Zeldin making statements such as: "No longer are we going to rely on bad, flawed assumptions instead of accurate, present-day facts, without apology or regret." "You were right there on the front lines of advocating against there being an endangerment finding in 2009. You were there even going back further pushing back on predictions that you knew were not going to bear out." "They [the Obama administration] don't ever talk about what's good and necessary about carbon dioxide for the life of the planet….").

[41] 90 Fed. Reg. at 36311-12 .

[42] 91 Fed. Reg. at 7729. EPA also appears to have reversed course on the relevance of atmospheric GHG concentration impacts, which it had indicated were important in the proposal, *e.g.*, 90 Fed. Reg. at 36311 ("GHG concentrations in the atmosphere or the rate of global climate change"), while the Final Rule newly claims that "changes in . . . global concentrations are not the focus of the statutory standard for regulation in CAA section 202(a)(1)," 91 Fed. Reg. at 7732.

[43] *See* 90 Fed. Reg. at 36326-27; EPA, Reconsideration of 2009 Endangerment Finding and Greenhouse Gas Vehicle Standards Draft Regulatory Impact Analysis, Docket No. EPA-HQ-OAR-2025-0194-0086 ("DRIA").

[44] The Final Rule also separately applies MOVES and OMEGA to estimate the regulatory impacts of the rule pursuant to Executive Order 12,866, and that analysis is found in an entirely separate portion of the administrative record. *See, e.g.*, 91 Fed. Reg. at 7753-57; EPA, Rescission of the Greenhouse Gas Endangerment Finding and Motor Vehicle Greenhouse Gas Emission Standards Under the Clean Air Act: Regulatory Impact Analysis, Docket No. EPA-HQ-OAR-2025-0194-31090 ("RIA"); EPA, Updated modeling assumptions and tools for "Rescission of the Greenhouse Gas Endangerment Finding and Motor Vehicle Greenhouse Gas Emission Standards Under the Clean Air Act" Final Rule, Docket No. EPA-HQ-OAR-2025-0194-31054 ("EPA Modeling Memo"); EPA, Projected Criteria, Air Toxics, and GHG Emissions Impacts for the "Rescission of the Greenhouse Gas Endangerment Finding and Motor Vehicle Greenhouse Gas Emission Standards Under the Clean Air Act" Final Rule, Docket No. EPA-HQ-OAR-2025-0194-31055 ("EPA Emissions Memo").

comparisons. Finally, EPA's Final Rule appears to focus on CO_2 for the futility analysis, in contrast to the proposal's discussion of vehicular GHG emissions more broadly.[45]

Many aspects of the Final Rule's futility analysis—such as the sole reliance on global temperature and sea level rise impacts, the three new *de minimis* thresholds, the total vehicle emissions inventory, the 50% illustrative scenario, and the exclusive focus on CO_2 in lieu of other GHGs—were not found in the proposal. With respect to these issues, EPA's relevant factual data, methodology used in analyzing the data, and quantitative assumptions and determinations are all new to the Final Rule.[46] Therefore, it was impracticable for commenters to raise objections to such analyses during the public comment period.[47] Further, EPA relies on these technical analyses to justify its new futility finding and rationales, which the Agency claims are independent, severable grounds for its final actions, and which the Agency further describes as affirming other aspects of the rule.[48, 49] These analyses are also deeply flawed for multiple independent reasons shown below.

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[45] *See* 90 Fed. Reg. at 36312 ("Eliminating GHG Emissions From All Motor Vehicles Would Be Futile"); T. Sherwood, Vehicle Rule LD/MD/HD Physical Effects, Docket No. EPA-HQ-OAR-2025-0194-0047 (assessing both CO_2 and non-CO_2 GHG emissions of U.S. vehicles).

[46] While some commenters also adduced technical modeling regarding global temperature, comments themselves cannot give notice. Moreover, EPA's Final Rule does not purport to rely on the commenters' analysis, but it instead presents its own analyses.

[47] 42 U.S.C. § 7607(d)(7)(B).

[48] EPA also claims its futility finding supports its other legal rationales based on the statutory interpretation of section 202(a)(1) and the major questions doctrine. 91 Fed. Reg. at 7716–17 (the conclusion that "agencies have implied authority to exempt *de minimis* concerns . . . informs our interpretation of CAA section 202(a)(1) by suggesting that the provision does not encompass the attenuated chain of causation required to invoke the authority to regulate GHG emissions where regulations cannot have more than a trivial impact on the identified dangers to health and welfare"), 7710–11 ("the inability of GHG emission standards to have a material (i.e., non-*de minimis*) impact on the dangers attributed to global climate change in the Endangerment Finding informs our statutory interpretation"), 7724 (in its major questions doctrine discussion, asserting that "even eliminating all GHG emissions from all U.S. vehicles and engines would have only a *de minimis* impact on GMST and GLSR trends as a proxy for adverse health and welfare impacts" as discussed in the futility section). However, EPA's discussion in other parts of the rule seem to undermine its judgment as to futility. *See, e.g.*, RTC at 48 ("the absence of ongoing or certain harm is not the reason the Agency is concluding that CAA section 202(a)(1) does not authorize regulating GHGs in response to global climate change concerns").

[49] The Final Rule now also claims futility as an "independent" basis for rescinding the vehicle and engine standards for GHGs even if the Endangerment Finding is authorized under section 202(a). 91 Fed. Reg. at 7734. EPA's futility argument is supported by the new modeling that was made available after the comment period, which as described throughout this petition, required mandatory reconsideration. EPA also asserts that its separate repeal of the vehicle GHG emission standards as based on futility is informed by a cost consideration requirement under *Michigan v. EPA*, 576 U.S. 743 (2015). However, EPA in the Final Rule arbitrarily contradicts itself, stating that "while the EPA did consider costs, *the EPA does not base its decision here upon cost*, but on the primary rationales laid out in the preamble." RTC at 211. (emphasis added). Indeed, EPA failed to grapple with commenters' criticisms of its proposed conclusions regarding costs. Any objection to EPA's about-face regarding the applicability of cost considerations to repeal of the vehicle GHG standards, while claiming that

As such, our objections are of "central relevance to the outcome of the rule" and proper grounds for statutory reconsideration under CAA section 307(d)(7)(B).

At the same time, we note that the critiques advanced in this petition for reconsideration overlap with many critiques advanced in public comments.[50] The public comments remain relevant to the Final Rule's futility rationale and were raised with "reasonable specificity."[51] While such objections were sufficiently raised during the comment period, they relate to and support the objections raised in the present petition, so we reference them here for clarity. As discussed in section I, by filing this petition for reconsideration we do not concede that any of the objections herein were not raised with reasonable specificity during the public comment period.

Among other things, commenters demonstrated that EPA erred as a matter of law in conflating the statutory "contribut[ion]" analysis with whether a regulation has "measurable" impacts. The Act requires EPA to make an endangerment finding where emissions from a class of vehicles contributes to dangerous air pollution, without any prerequisite determination as to whether subsequent regulations would materially affect air pollution.[52] Commenters also presented technical modeling demonstrating that EPA's GHG standards have created and continue to create massive public health and welfare benefits of the kinds that Congress identified in the Act, including climate benefits valued up to $3.9 trillion,[53] alongside a wide range of other evidence showing significant benefits to health and welfare.[54] In addition, commenters presented arguments that EPA should not repeal existing vehicle GHG standards, which are reasonable and lawful, with enormous benefits that far outweigh costs.[55] Commenters further demonstrated why EPA's proposed method of comparing alleged impacts of U.S. vehicle GHG emissions on climate change trends with a so-called "scientific threshold for measurability" was legally and technically erroneous on numerous bases, including because EPA:

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its decisions in the Final Rule were not based on cost, could not practicably be raised during, and arose after the time for, the comment period. EPA's basis for its supposedly independent repeal of the vehicle GHG standards thus requires mandatory reconsideration.

[50] *See, e.g.,* Comment submitted by Environmental Defense Fund (EDF) et al., Docket No. EPA-HQ-OAR-2025-0194-3060 ("NGO Vehicles Comment"); Comment submitted by Natural Resources Defense Council (NRDC) et al., Docket No. EPA-HQ-OAR-2025-0194-2608 ("NGO EF Comment"); Comment submitted by The Institute for Policy Integrity at New York University School of Law et al., Docket No. EPA-HQ-OAR-2025-0194-3050 ("Joint SC-GHG Comment"). While our petition principally cites to certain comments filed by environmental and public health groups to demonstrate issues which were raised with reasonable specificity during the public comment period, we note that numerous other comments were made raising one or more of the critiques described in this discussion. *See, e.g.,* Comment submitted by Massachusetts Office of the Attorney General et al., Docket No. EPA-HQ-OAR-2025-0194-13587 ("States EF Comment"); Comment submitted by Attorney General of California et al., Docket No. EPA-HQ-OAR-2025-0194-2974 ("States Vehicles Comment").

[51] CAA section 307(d)(7)(B).

[52] *See, e.g.,* NGO Vehicles Comment at 86.

[53] *See, e.g., id.* at 16-18.

[54] *See, e.g., id.* at 91-189.

[55] *See, e.g., id.*

- Arbitrarily and without explanation considered only undefined climate change trends, while neglecting to consider more relevant metrics such as the damages to society caused by GHG emissions and the corresponding benefits of mitigating such emissions, consistent with EPA's longstanding practices;
- Arbitrarily and without explanation selected an irrelevant comparative climate measurability metric;
- Erroneously conflated measurability of climate change metrics with the materiality of reducing emissions;
- Ignored the cumulative and long-term nature of GHG emissions impacts; and
- Acted inconsistently with the Agency's approach to addressing criteria pollutants.[56]

Notwithstanding the Final Rule's novel technical methodology and analysis, it adopts analogous or the same reasoning as the proposal on these aspects of its futility rationales, such that the commenters' critiques continue to apply to the Final Rule. The balance of this section focuses on our objections to the Final Rule's new technical analysis.

B. EPA's new modeling of emissions, global temperature, and global sea level rise is arbitrary and capricious.

In this section, we raise several objections of central relevance to EPA's modeling of emissions and changes in global temperature and sea level rise. Each objection highlights the sensitivity of EPA's analysis to differing assumptions and methodologies, and the Agency's inexcusable failure to subject key elements of its technical analysis to statutorily required notice and comment.

First, EPA's sole reliance on its chosen metrics—the proportional contribution of U.S. vehicle GHG emissions to global average temperature and sea level rise—is an arbitrary way of measuring and valuing health and welfare harms from those emissions and of assessing the purported futility of the U.S. vehicle GHG standards. In fact, as EPA concedes, these intermediate metrics do not actually measure U.S. health and welfare harms at all. EPA cannot rationally rely on only these metrics to evaluate the futility of exercising its legal authority, and commenters criticized EPA's use of such metrics as proxies for assessing health and welfare harms in lieu of direct assessment of such harms.[57] We further detail these critiques to contextualize our objections to the Agency's new technical analysis.

Second, EPA arbitrarily selected 2027 as the baseline year for its modeling. By doing so, EPA's modeling incorporates all the emission reductions achieved by GHG emission standards over the prior 15 years—including the ongoing benefits of the emission reduction technologies those standards induced—while simultaneously claiming GHG standards do nothing meaningful. The modeling thus arbitrarily "bakes in" the powerful effects of the substantial reductions that GHG

[56] *See, e.g., id.* at 104-110.
[57] *See, e.g.,* RTC at 215 (noting that a "commenter stated that the EPA should utilize a different metric for consideration of futility that is not temperature change or sea-level rise"); Joint SC-GHG Comment at 5-6; NGO Vehicles Comment at 101-04; Comment submitted by Nathan Sweet et al., Docket No. EPA-HQ-OAR-2025-0194-1461.

standards thus far have achieved in both vehicle GHG emissions and in pollution-control technology costs. In circular fashion, EPA argues that the achievements of the standards make those standards futile.

Third, EPA arbitrarily assumes U.S. vehicle emissions will flatline after 2055, despite projections showing continued growth in vehicle miles traveled (VMT) through at least 2060. The Agency provides no basis for believing that VMT will stop growing or that vehicle GHG performance will improve sufficiently to offset increased travel absent regulation, especially as recent Administration actions actively undermine programs that promote cleaner vehicles.

Fourth, EPA's arbitrary selection of 2050 and 2100 as modeling endpoints significantly undervalues the climate impacts of U.S. vehicle GHG emissions in two ways: the proportional contribution of U.S. vehicles to global emissions is expected to grow from approximately 4% today to 10% by 2100 as other sectors decarbonize; and GHG emissions persist in the atmosphere for centuries, causing cumulative warming effects that extend well beyond 2100. Cherry-picking these endpoints significantly understates the impacts of U.S. vehicle GHGs on climate change.

Finally, EPA appeared to have arbitrarily counted only vehicle CO_2 emissions to the exclusion of non-CO_2 greenhouse gas emissions for purposes of its futility analysis. However, motor vehicles unquestionably emit non-CO_2 greenhouse gases as well, and EPA even models such non-CO_2 emissions in its Regulatory Impact Analysis (RIA) for the Final Rule. It has no basis to exclude those impacts from its modeling for the purpose of determining futility.

1. EPA's futility analysis solely considers the proportion of global average temperature and sea level changes caused by U.S. vehicle emissions, obscuring their enormous harms to American public health and welfare.

EPA states that under section 202(a) "the ultimate regulatory concern is impacts from air pollution on 'health or welfare.'"[58] Nonetheless, the Agency irrationally selects proportional global temperature and sea level rise changes as the exclusive metrics for evaluating futility. Both are metrics of the physical climate and do not directly represent health or welfare impacts. As EPA concedes in the preamble, these metrics "are not themselves the adverse impacts on health and welfare relevant for purposes of the analysis," and they "do not translate directly to adverse health and welfare impacts."[59] Thus, while global average surface temperatures and sea level rise are certainly relevant to climate change and may be reasonably considered in evaluating whether GHG pollution endangers health and welfare,[60] they are only intermediate metrics. EPA acted irrationally by considering *only* these intermediate metrics and by not considering the ultimate health and welfare impacts resulting from projected temperature and sea level increases, as well as other pathways by which GHG emissions harm health and welfare.[61] It is arbitrary and capricious to rely solely on

[58] 91 Fed. Reg. at 7732.
[59] *Id.*
[60] EPA does not appear to evaluate global temperature and sea level rise for this purpose in the Final Rule.
[61] For instance, as commenters described, vehicle GHG emissions have impacts on health and welfare that are not directly mediated by changes in temperature or sea level rise. Such changes

measures that "are not themselves the adverse impacts on health and welfare relevant for purposes of the analysis"[62] to claim that the program has "no meaningful impact on the identified dangers"[63] of climate change on health and welfare.[64]

EPA attempts to explain why relying on global temperature and sea level rise is superior to other physical impacts, but its argument is conclusory and unsupported. The Agency claims, without further explanation or citation, that other physical impacts—such as "hurricanes, floods, heat waves, ocean acidification, etc."—are "speculative, multi-faceted, and multi-causal."[65] As commenters explained, there is a scientific consensus that extreme weather events, such as hurricanes, floods, and heat waves, are becoming more frequent and intense due to climate change; and relatedly, increasing atmospheric CO_2 concentrations are also aggravating ocean acidification.[66] These metrics are more direct measures of public health and welfare impacts than the intermediate metrics of average global temperature or sea level increases. That is, as explained in comments, the American people and economy palpably and directly experience a hurricane hitting the Gulf Coast, a 100-year flood in Texas, a heat wave in the Pacific northwest, and a degradation of coral reefs and fisheries off the coast of Florida.[67] As such, EPA's cursory explanation for relying exclusively on global temperature and sea level rise in lieu of other physical, human health, and welfare factors in evaluating potential regulatory futility is arbitrary and unjustifiable.

Referring to its futility analysis, EPA further asserts that "the analytical difficulties, uncertainties, and multiple causal leaps involved in this exercise are themselves a reason to conclude that CAA section 202(a)(1) does not encompass emissions that can be said to lead to adverse health and welfare impacts only by constructing a global air pollution framework."[68] It is unclear what this line of argument means, as it appears to contradict the premise of the futility analysis itself.[69] To the extent EPA is reprising its proposed (but not finalized) scientific uncertainty rationale as an alternative basis for the Final Rule's conclusions on statutory authority, that is arbitrary and logically incoherent, as EPA simultaneously states that the Agency "is not relying on [any] new findings" of the health and welfare risks from GHG pollution,[70] and that "EPA does not adopt or rely on the proposed scientific alternative rationale" in its proposal."[71]

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include ocean acidification and direct CO_2 physiological effects on the nutritional value of crops. *See, e.g.,* NGO EF Comment 47-48, 141-50, 212-14.

[62] 91 Fed. Reg. at 7732.

[63] *Id.* at 7728.

[64] As our comments have already shown, this choice is doubly irrational given its divergence from the Agency's historical practice concerning metrics for evaluating the costs of GHG emissions and associated harms. *See* NGO EF Comment at 150-53; NGO Vehicles Comment at 102-03.

[65] 91 Fed. Reg. at 7732.

[66] *See generally* NGO EF Comment at 99-169.

[67] *See generally id.*

[68] 91 Fed. Reg. at 7732.

[69] *See id.* at 7729 (stating as the premise of its futility analysis that "the EPA is utilizing the climate modeling provided within this section to help illustrate that, even applying the assumptions of these climate models and uncertainties contained therein, that removing" U.S. vehicle GHG emissions would be futile).

[70] *Id.* at 7689 n.4.

[71] *Id.* at 7734; *see also id.* at 7734-38.

Even if global temperature and sea level rise were appropriate touchstones for evaluating the potential futility of vehicle GHG standards, the Agency's choice to focus on the impact of U.S. vehicles as a *proportion* of global anthropogenic impacts is independently arbitrary. Practically speaking, where the ultimate harm—like that of climate change—is catastrophic, even a tiny increment of harm can be highly meaningful and legally cognizable.[72] For example, while a 1% increase in the chance that you will pay a $100 parking ticket may be *de minimis*, a 1% increase in the chance that you will get cancer is certainly *not de minimis*.[73] Neither is a 1% decrease in the stock market, or a 1% decrease in the GDP.[74] And a 1% disparity between an architect's plans and a builder's product could very well be the difference between a functioning building and a heap of rubble. As commenters explained with extensive evidence, the absolute impacts of U.S. vehicle GHG emissions on the public health, the environment, and the economy are massive by any measure.[75] And even small increases in GHG emissions can cause material harms to public health and welfare,[76] particularly given the existence of feedback loops and "tipping points" at which even slight emission increases can generate large and irreversible harms.[77]

Moreover, EPA's sole reliance on measures of *average* global change in temperature or sea level is arbitrary because such impacts do not occur uniformly throughout the globe. As we detail in Appendix B, the continental U.S. has warmed 60% faster than the global average since 1970.[78] And many U.S. regions have warmed even faster, with arctic Alaska warming at three times the global

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[72] *See, e.g.*, Joint SC-GHG Comment at 6-7; *Citadel Sec. LLC v. SEC*, 45 F.4th 27, 36 (D.C. Cir. 2022) (observing that significance is context-dependent: "a one-second delay during a cruise across the Atlantic may be *de minimis*, but a one-second delay during a 100-yard dash is enormous"); *Ethyl Corp. v. EPA*, 541 F.2d 1, 18 (D.C. Cir. 1976) (en banc) ("[P]ublic health may properly be found endangered both by a lesser risk of a greater harm and by a greater risk of a lesser harm"); NGO EF Comment 49 n.54 (citing H.R. Rep. No. 95-294, at 50 (1977), *reprinted in* 1977 U.S.C.C.A.N. 1077, 1128).

[73] *See, e.g.,* CAA section 112(f)(2)(A), 42 U.S.C. § 7412(f)(2)(A) (requiring EPA to promulgate risk-based air toxics emissions standards where technology-based standards "do not reduce lifetime excess cancer risks to the individual most exposed to emissions from a source in the category or subcategory to less than one in one million").

[74] We critique EPA's 1% *de minimis* threshold further in section V.B below.

[75] *See* NGO EF Comment at 98-169; Joint SC-GHG Comment at 3-4; EDF Technical Comments at 64-108; *see also* National Academies of Sciences, Engineering, and Medicine, *Effects of Human-Caused Greenhouse Gas Emissions on U.S. Climate, Health, and Welfare*, National Academies Press, 4-8 (2025), https://doi.org/10.17226/29239. Interagency commenters within the Federal government raised similar concerns. *See* Documentation of OMB/Interagency Review Under Executive Order 12866, Docket No. EPA-HQ-OAR-2025-0194-31104, Attach. 12715 2060-AW71 EF Vehicle Rule FRM Preamble EO 12866 To OMB 02032026 - RLSO at 140 ("Note also that a 1% effect is small relative to the total, but a 1% effect could entail a material change if the total is sufficiently large").

[76] *See, e.g.*, NGO Vehicles Comment at 107-08.

[77] *See* NGO EF Comment at 153; Joint SC-GHG Comment at 18-20.

[78] Kate Marvel et al., *Climate Trends*, *in* Fifth National Climate Assessment (Allison R. Crimmins et al eds., U.S. Glob. Change Research Program 2023), 2-4, https://toolkit.climate.gov/sites/default/files/2025-07/NCA5_Ch2_Climate-Trends.pdf.

average rate,[79] and Northeastern states such as Maine, New Jersey, and Rhode Island warming at nearly twice the global average.[80] Thus, EPA's projected global temperature impacts would likely be associated with greater impacts in those regions of the U.S.

Similarly, regions of the U.S. are experiencing far greater sea level rise than the global average. As commenters explained, continental U.S. sea level rise has significantly exceeded global average sea level rise over the past century.[81] Certain U.S. cities are experiencing even more rapid sea level rise. For example, Grand Isle, Louisiana, is currently experiencing a rise rate of 7.72 mm/year, while Rockport, Texas faces a rate of 6.71 mm/year—more than double the global mean of approximately 3.1 mm/year.[82] As with temperature, EPA's projected sea level rise impacts would likely be associated with greater impacts in these and other parts of the U.S. Even accepting the basic premise of EPA's futility framework, it would still be arbitrary to withdraw regulatory authority based on allegedly *de minimis* impacts on global averages when American cities and states would suffer greater and meaningful harms.

2. EPA arbitrarily selected 2027 as the baseline year for its modeling, relying on the emissions reductions benefits gained over the last decade-and-half of section 202(a) regulation to argue that such regulation is futile.

This critical modeling choice is arbitrary for two reasons. First, even assuming futility was a statutorily permissible basis for repealing the Endangerment Finding and GHG standards, the selection of 2027 as the baseline year is inconsistent with EPA's claim that the Agency lacks *any* statutory authority to regulate GHGs from vehicles. That is, to use futility as a basis for disclaiming all statutory authority to regulate GHGs, EPA would have to show that regulation *always* was and will be futile—including from the time of the 2009 Endangerment Finding—not merely starting with model year 2027. Second, the 2027 baseline year arbitrarily allows EPA to disregard and

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[79] T.J. Ballinger et al., NOAA, *Arctic Report Card 2025: Surface Air Temperature* 1 (Nov. 18, 2025), https://arctic.noaa.gov/report-card/report-card-2025/surface-air-temperature-2025/; M.L. Druckenmiller et al., NOAA, *Arctic Report Card 2025: Executive Summary* (Dec. 23, 2025), https://doi.org/10.25923/NRZF-J897.

[80] *See* Appendix B at 7 (collecting authorities); *see also* Environmental Law & Policy Center, *An Assessment of the Impacts of Climate Change on the Great Lakes*, 10 (2019), https://elpc.org/wp-content/uploads/2020/04/2019-ELPCPublication-Great-Lakes-Climate-Change-Report.pdf ("In the Great Lakes region, the U.S. states bordering the Great Lakes have seen an overall increase in annually averaged temperature of 1.4°F for the period 1985-2016 relative to 1901-1960, with the largest changes at the higher latitudes… For the extent of the Great Lakes Basin…, the temperature change is 1.6°F over this time period. These trends are higher than the overall change of 1.2°F over the contiguous United States (and found globally) for the trends over these time periods.").

[81] *See* NGO EF Comment at 210 (since 1900, regional relative sea level along the continental U.S. "rose on average by approximately 11 inches," compared to about 7 inches globally).

[82] John D. Boon et al., *Anthropocene Sea Level Change: A History of Recent Trends Observed in the U.S. East, Gulf, and West Coast Regions*, Va. Inst. of Marine Sci., Applied Marine Sci. and Ocean Eng'g, Spec. Rep. No. 467, at IV-2 (2018), https://scholarworks.wm.edu/entities/publication/fc099785-8ecc-47ec-9818-835ea9c8f19e; William V. Sweet et al., NOAA, *Global and regional sea level rise scenarios for the United States: Technical Report NOS.01* 7 (Feb. 2022), https://earth.gov/sealevel/us/resources/2022-sea-level-rise-technical-report/.

obscure a significant slice of the benefits of regulating vehicle GHG emissions: the model bakes in the powerful effects of the GHG program in reducing vehicle GHGs and emission-reduction technology costs over the last 15 years and going forward. EPA thus uses the benefits that have been already achieved under the GHG program to argue that the program does nothing meaningful. "[This] is like throwing away your umbrella in a rainstorm because you are not getting wet."[83]

First, EPA is not using this analysis to support a finding that prospective regulation (i.e., beginning with MY2027 vehicles) is no longer appropriate. Nor is EPA repealing only the prospective MY2027 and later GHG standards. Rather, the Agency is asserting that *any* past, present, or future vehicle GHG emission standards would be futile, that section 202(a) therefore provides no statutory authority to regulate GHGs at all, and consequently, that EPA must repeal the entire program, including all past and future standards and the 2009 Endangerment Finding.[84] But EPA cannot demonstrate that any and all GHG emission standards under section 202 are necessarily futile based only on modeling of the prospective impacts of regulating GHGs today, beginning in MY2027. Rather, even if futility were somehow a legitimate basis for withdrawing the Agency's statutory authority—and EPA fails to show that it is—the Agency would have to show that GHG regulation was futile *ab initio* and remained futile under all circumstances, including such circumstances as existed at the time of the 2009 Endangerment Finding itself. But EPA has not done so, or even purported to do so, instead selecting 2027 as its sole analytical baseline year, without analyzing any other scenarios.[85]

Second, it is circular for EPA to find that regulation could not materially affect health and welfare based on an analytical baseline that incorporates the emissions—and consequent health and welfare—benefits of the regulations that EPA now claims it lacked authority to issue. As EPA acknowledges, the GHG program has driven significant reductions in vehicle GHGs since its inception, including through the development of advanced internal combustion engine, hybrid, and zero-emission vehicle technologies.[86] For example, the EPA Automotive Trends report indicates a 23% decrease in average light-duty vehicle GHG emissions between 2009 and 2024.[87] Those technological developments and emissions reductions are reflected in MY2027 vehicles. Thus, by using 2027 as the analytic baseline, EPA tacitly (and wrongly) assumes that the considerable

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[83] *Shelby County v. Holder*, 570 U. S. 529, 590 (2013) (Ginsburg, J., dissenting).

[84] *See* 91 Fed. Reg. at 7691 (futility "supports the understanding that Congress did not design [section 202(a)(1)] to authorize or require the Administrator to prescribe standards in response to global climate change concerns"); 91 Fed. Reg. at 7688 (alleging that *de minimis* impacts mean that "regulation of GHG emissions falls outside the scope of air pollution problems Congress addressed when enacting CAA section 202(a)(1)").

[85] *Cf. United States v. Salerno*, 481 U.S. 739, 745 (1987) ("The fact that the Bail Reform Act might operate unconstitutionally under some conceivable set of circumstances is insufficient to render it wholly invalid, since we have not recognized an 'overbreadth' doctrine outside the limited context of the First Amendment.").

[86] *See, e.g.*, 91 Fed. Reg. at 7727; Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light Duty and Medium-Duty Vehicles, 89 Fed. Reg. 27896 (Apr. 18, 2024).

[87] *See* EPA, *The 2024 EPA Automotive Trends Report Greenhouse Gas Emissions, Fuel Economy, and Technology since 1975*, EPA-420-R-24-022 14 (Nov. 2024), https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P101CUU6.pdf (showing a decrease in real-world fleet CO_2 emissions from 397g/mi in 2009 to 305g/mi in 2024).

improvements and emission reductions achieved by the GHG standards over the last 15 years would somehow have happened anyway, ignoring the substantially higher emissions and technology costs that likely would have been part of the baseline had EPA never exercised the regulatory authority that it now seeks to disclaim.[88]

In addition to shaping the current baseline, those regulatorily induced benefits will continue to be reflected in all vehicles made in later model years. That is, past GHG standards continue to spur ongoing emissions reductions.[89] EPA's own modeling assumes this, ranging from increasing adoption of electric vehicles over time, as well as greater uptake of advanced internal combustion engine technologies.[90] Given EPA's assertion that futility permits no regulatory authority at all, it should have assessed the impacts of a fleet whose GHG emissions were *never* regulated to begin with, not merely those of a fleet which has received the benefit of 15 years of protective GHG regulations.

3. EPA arbitrarily assumes U.S. vehicle emissions flatline after 2055.

EPA's modeling assumption that U.S. vehicle emissions flatline after 2055 is arbitrary. U.S. vehicle emissions in any given year depend largely on vehicle miles traveled (VMT) and fleet composition (i.e., the proportions of different vehicle technologies and their GHG performance). VMT is expected to increase over time. While fleet composition changes could improve the fleet's overall GHG emissions performance, it is also possible that overall GHG emissions could increase with rising VMT. Moreover, any such fleet-performance improvements would reflect the baked-in effects of the historical GHG regulatory program in spurring technological development and commercialization, and thus those improvements should not be considered in determining whether regulation is futile.

Beginning with VMT, as the U.S. population and economy grow, projections show greater demand for vehicle transportation. Consistent with this reasoning, EPA's MOVES model shows increasing VMT through 2060, which is the final year modeled by MOVES.[91] Similarly, the Federal Highway Administration projects ongoing annual growth in VMT up through the final year of its

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[88] EPA's earlier GHG rules projected significant emissions reductions above the baseline. *See, e.g.*, Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Final Rule, 75 Fed. Reg. 25328 (May 7, 2010).

[89] Future GHG emission standards would drive further improvements and preclude backsliding in progress toward reducing emissions. But even absent such emission standards, manufacturers are likely to retain some portion of the GHG performance improvements they have made over the past 15 years thanks to the GHG program.

[90] For example, the modeling files provided to Petitioners by the EPA Docket Center indicate that light-duty electric vehicle sales rise from 12% in 2027 to 31% in 2035 to 48% in 2055. *See* EPA Modeling Memo, Att. \LMHDV\A1\20251117_151129_a1.zip\20251117_151129_a1\ 20251117_151129_tech_shares.csv; EPA, Updated modeling assumptions and tools for "Rescission of the Greenhouse Gas Endangerment Finding and Motor Vehicle Greenhouse Gas Emission Standards Under the Clean Air Act " Final Rule, Docket No. EPA-HQ-OAR-2025-0194-31054.

[91] *See* Appendix A (discussing the increasing VMT projections in MOVES and the Annual Energy Outlook).

outlook, 2053.[92] The Final Rule provides no basis for believing that VMT will abruptly stop growing in 2055.

Absent improved GHG performance, increases in VMT directly correspond to increased emissions. EPA has not shown that, absent regulation, U.S. vehicle GHG performance will improve in 2055 and later years,[93] or that the quantum of such performance improvements will result in U.S. vehicle emissions flatlining notwithstanding VMT increases. By contrast, EPA's Final Rule and other recent Administration and congressional actions—such as the sunsetting of tax credits for lower-emitting technologies, weakening of the NHTSA fuel economy program, and nullification of preemption waivers for California's separate vehicle emission standards—are intended to halt programs that promote the manufacture and sale of cleaner vehicles.

4. EPA arbitrarily selected 2050 and 2100 as final years for its modeling, obscuring the full climate change harms caused by U.S. vehicle GHGs, which last long after 2100.

EPA models U.S. vehicle GHG impacts on global temperature and sea level rise as a proportion of global anthropogenic GHG impacts in 2050 and 2100. The Agency's choice to analyze only these two points in time is arbitrary, because they significantly undervalue the increasing and long-term adverse harms of climate pollution from U.S. vehicles in two critical ways. First, under EPA's framework, the proportional contribution of U.S. vehicles to global emissions is anticipated to increase over time; and second, GHG emissions accumulate in the atmosphere and continue to affect the physical climate for centuries and even millennia after their release.

EPA's own modeling shows that if the Agency stops controlling U.S. vehicular GHG emissions, the proportional contribution of those emissions to annual global totals will balloon over time, from approximately 4% of 2027 global CO_2 emissions today to 10% of 2100 emissions. Contrary to what EPA has claimed about U.S. vehicles being such a small slice of the total GHG emissions pie that they are not worthwhile to control, eliminating the GHG program is expected to dramatically *increase* the slice of the pie attributable to U.S. vehicles, even as other nations and sectors reduce their emissions. Moreover, 10% of global CO_2 emissions is by any account a significant portion of an air pollution problem—even without considering its global nature. Petitioners are not aware of, and EPA does not reference, any Agency precedent for determining that regulation of a category of air pollutant emissions that amounts to 10% of the total air pollution problem would have *de minimis* effects.

Second, EPA's failure to consider impacts after 2100 also ignores the long lasting and cumulative impacts of GHG emissions. The warming effect of a ton of GHGs emitted into the atmosphere today persists over very long timeframes. Significant portions of emitted CO_2 remain in the atmosphere for centuries and even millennia, generating a persistent physical climate response.

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[92] *See 2025 FHWA Forecasts of Vehicle Miles Traveled* (VMT) (Sept. 2025), https://www.fhwa.dot.gov/policyinformation/tables/vmt/vmt_forecast_sum.cfm ("The Federal Highway Administration (FHWA) Spring 2025 long-term forecast of national vehicle miles traveled (VMT) projects total VMT increasing at an average annual rate of 0.6% between 2023 and 2053.").

[93] As explained above in the 2027 baseline year section, it is also not appropriate for EPA to account for these baked-in effects of the GHG program in determining whether or not the program is futile.

While other GHGs have different atmospheric lifetimes,[94] all result in climate responses that persist far beyond the year they are emitted. And U.S. vehicles produce emissions year after year, with annual emissions largely stacking on top of one another as they accumulate, similar to water that continues to be added into a bathtub slower than it drains. Modeling only impacts through 2100 arbitrarily ignores the persistent and cumulative impacts of U.S. vehicle GHGs on climate change that last beyond than 2100.

EPA's truncated modeling time-period contrasts sharply with how the Agency assesses the harm done by ozone-depleting chemicals and the benefits of curbing those chemicals. In 2020, EPA assessed those harms and benefits over a substantially longer time period in the context of stratospheric ozone protection. EPA's Atmospheric and Health Effects Framework Model (in use since the 1980s) "estimates the number of skin cancer and cataract cases and deaths from skin cancer in the United States that will be prevented by protecting the ozone layer" for people born in the U.S. from 1890 through 2100.[95] Persons born in 2100 may have a life expectancy of some 75 years (if not longer), meaning that the time-period for this EPA modeling should extend to at least 2175, encompassing most of the 22nd century. EPA has not provided any basis for adopting a more truncated time period in this rulemaking.

The above errors compound each other. Setting a cut-off date of 2100 for the modeling underweights the impact of latter years of higher proportional emissions (e.g., 10% of global CO_2 emissions in 2100), as well as the long-lasting and cumulative harms of GHG emissions beyond 2100. Both obscure the full impacts of vehicle GHGs on climate change. Extending the modeling period would more fully capture the effects of U.S. vehicle GHG emissions on global climate change concerns. EPA acted arbitrarily in cherry-picking the 2050 and 2100 endpoints without any explanation and outside the scrutiny of public comment. And as we quantitatively demonstrate in section IV.C, the selection of different endpoints leads to dramatically different conclusions.

5. EPA arbitrarily excluded vehicular emissions of nitrous oxide (N_2O), methane (CH_4), and hydrofluorocarbons (HFCs), from its analysis, even though motor vehicles unquestionably emit such gases.

In the 2009 Endangerment Finding, EPA determined that nitrous oxide, methane, and hydrofluorocarbons are among the GHGs that endanger human health and welfare, and concluded that emissions of those gases from motor vehicles contribute to that endangerment.[96] Indeed, a separate EPA technical memorandum on the impacts of the Final Rule models nitrous oxide and methane emissions, consistent with EPA's treatment of those pollutants in past vehicle GHG

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[94] *See* NASA, *Major Greenhouse Gas Sources, Lifespans, and Possible Added Heat* (June 22, 2023). https://science.nasa.gov/resource/graphic-major-greenhouse-gas-sources-lifespans-and-possible-added-heat/.

[95] EPA, *Atmospheric and Health Effects Framework Model Estimating Ultraviolet Radiation-induced Health Effects*, (Mar. 17, 2026), https://www.epa.gov/ozone-layer-protection/atmospheric-and-health-effects-framework-model-estimating-ultraviolet. The full report entitled *Updating the Atmospheric and Health Effects Framework Model: Stratospheric Ozone Protection and Health Benefits*, (May 2020), is posted at https://www.epa.gov/sites/default/files/2020-04/documents/2020_ahef_report.pdf.

[96] 91 Fed. Reg. at 7689 (citing 74 Fed. Reg. at 66516–17, 66536–37).

rules.[97] Yet the Agency's futility analysis arbitrarily ignores these greenhouse gases and models only the impacts of CO_2.[98]

EPA's exclusion of HFCs from its futility analysis is also unsupportable. HFCs, which are emitted from vehicle air-conditioner leakage, are climate super-pollutants, with a global warming potential hundreds or thousands of times higher than CO_2—in other words, one ton of HFC emissions has a vastly more powerful and immediate impact on climate change than one ton of CO_2. EPA appears to suggest that its futility analysis disregarded vehicle HFC emissions because there is "separately enacted legislation requiring a phase out of HFCs" under a different section of the Clean Air Act.[99] But as commenters explained, the relevant section of the Act, also known as the American Innovation and Manufacturing (AIM) Act of 2020, did not displace EPA's authority to regulate HFCs under section 202(a), and, in fact, the two statutory authorities complement each other.[100] The AIM Act therefore cannot justify the Final Rule's arbitrary disregard of any past, present, and future potential for HFC regulation under section 202(a). EPA has also previously analyzed and described the impacts of its section 202(a) regulations on HFC emissions.[101] And the Agency neglects to note that despite the regulation of certain motor vehicle air conditioners under the Technology Transitions Rule the Agency promulgated under the AIM Act of 2020, EPA's 2024 vehicle rule chose to retain an air conditioner leakage credit under its section 202(a) program to further drive down HFC emissions.[102] Moreover, the Technology Transitions Rule did not regulate air

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[97] *See* EPA Emissions Memo.

[98] *See* Rescission of the Greenhouse Gas Endangerment Finding and Motor Vehicle Greenhouse Gas Emission Standards Under the Clean Air Act, 91 Fed. Reg. at 7729-34 & tab.1-3 (Feb. 18, 2026). The relevant section of the Final Rule preamble exclusively discusses CO_2. The EPA Temperature Memo confusingly suggests the Agency did model nitrous oxide and methane as well, *see* EPA Temperature Memo 1-2, but it only appears to present results for CO_2, *see id.* at 4-6. We assume the Agency's presentations of exclusively CO_2 results in both the preamble and this technical memo supersede its suggestion that it may have also modeled nitrous oxide and methane for its futility analysis. To the extent the Agency did in fact model nitrous oxide and methane for its futility analysis, and simply chose to omit the results, such an omission is also arbitrary and capricious.

[99] 91 Fed. Reg. at 7729 n.172.

[100] NGO EF Comment (citing 89 Fed. Reg. at 27918).

[101] *See, e.g.*, EPA, NHTSA, *Final Rulemaking to Establish Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles: Regulatory Impact Analysis* (Aug. 2011), https://nepis.epa.gov/Exe/ZyPDF.cgi/P100EG9C.PDF?Dockey=P100EG9C.pdf ("HD Phase 1 GHG RIA"); EPA, NHTSA, *Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles – Phase 2: Regulatory Impact Analysis* 5-34 (Aug. 2016), https://nepis.epa.gov/Exe/ZyPDF.cgi/P100P7NS.PDF?Dockey=P100P7NS.pdf (last visited Apr. 9, 2026) ("HD Phase 2 GHG RIA"); EPA, *Final Rulemaking for 2017-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards: Regulatory Impact Analysis* (Aug. 2012), https://nepis.epa.gov/Exe/ZyPDF.cgi/P100EZI1.PDF?Dockey=P100EZI1.pdf.

[102] Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles, 89 Fed. Reg. 27856 (Apr. 18, 2024) (". . . EPA is retaining small A/C refrigerant credits designed to incentivize the continued application of A/C refrigerant leakage mitigation countermeasures and the use of refrigerants with GWP lower than that required under the

conditioners in heavy-duty vehicles, and EPA is now eliminating the standards for those vehicles, which it previously had calculated as generating significant HFC emissions benefits.[103] There is no rational justification for excluding HFCs from the futility analysis.

C. Petitioners' modeling illustrates errors of central relevance in EPA's futility analysis.

Petitioners performed modeling to illustrate the severity of the errors infecting EPA's new futility analysis and how different methodological choices significantly affect EPA's findings and rationale. We begin by describing the methodology for the different emissions inputs and analytical timeframes in each of the three scenarios we modeled. We then present the results for U.S. vehicle emissions of CO_2, N_2O, and methane; and the contribution of U.S. vehicles to changes in atmospheric CO_2 concentrations, global temperature, and global sea level rise. A more detailed description of our methodology and results is in Appendix A.

1. Petitioners' modeling methodology

Besides the differences summarized below, petitioners' modeling generally followed EPA's methodology, including in the selection of the SSP2-4.5 baseline global emissions scenario, and the use of the same models as EPA: OMEGA, MOVES, FaIR, and BRICK. We modeled three scenarios, which we label A, B, and C:

- **Scenario A** ("EPA Emissions Inputs") assumes the same emissions inputs as EPA's modeling for the U.S. on-road sector.[104]
- **Scenario B** ("Today's Fleet") assumes that today's U.S. new vehicle fleet composition and per-vehicle emissions rates extend in perpetuity, with total emissions driven by VMT growth and fleet turnover. We use MY2025 to approximate today's fleet, as this is the most recent year with sufficiently reported data at the time we conducted our modeling. Consistent with the Trump Administration's rollbacks of key clean vehicle programs, this scenario shows a new vehicle fleet that does not become cleaner over time and

Technology Transitions Rule."); *see also* 89 Fed. Reg. at 28097 ("though not quantified, there is the potential that the final program could result in reductions of hydrofluorocarbon (HFC) emissions").

[103] *See, e.g.*, HD Phase 2 GHG RIA 5-34 ("The projected HFC emission reductions due to the A/C leakage standards are estimated to be 86,735 metric tons of CO_2eq in 2025, 256,061 metric tons of CO_2eq in 2040, and 314,930 metric tons CO_2 eq in 2050."); HD Phase 1 GHG RIA at 5-13 (estimating HFC reductions of 436,483 metric tons CO_2eq in calendar year 2030).

[104] The preamble describes these as scenarios #2 and #1 respectively. We do not separately present results for U.S. light and medium duty vehicles, and U.S. heavy duty vehicles (preamble scenarios #2a and #2b), as the Final Rule does not allege futility based on these scenarios. As discussed further in Appendix A and below, EPA did not disclose most of its emissions inputs, and Petitioners had to extrapolate some of the data points.

where electric vehicle adoption rates remain constant.[105] This scenario also recognizes that any future emissions improvements would be predicated on previous research, development, and learning catalyzed by the GHG program to date, and models the absence of such future emissions improvements in assessing whether the whole GHG program is futile, as discussed in section IV.B.2 regarding the selection of baseline year. Scenario B also corrects EPA's arbitrary choice to flatline emissions after 2055, as discussed in section IV.B.3, and its arbitrary choice to exclude nitrous oxide and methane emitted by motor vehicles, as discussed in section IV.B.5.

- **Scenario C** ("Pre-GHG Protection Fleet") assumes that U.S. new vehicle fleet composition and per-vehicle emissions rates as of approximately the time of the 2009 Endangerment Finding extend in perpetuity, with total emissions increasing proportionally to VMT.[106] This scenario addresses EPA's arbitrary choice to examine only one scenario with a 2027 baseline year. As we explained in section IV.B.2, even assuming that this kind of futility analysis is relevant to statutory authority to issue GHG standards, EPA would have to show that *any* such standards would be futile, not only a standard commencing with MY2027 and beyond. To illustrate the impact of selecting a different scenario that does not already bake in the emissions benefits of the GHG program to date, we chose to evaluate U.S. vehicle emissions roughly at the time of the 2009 Endangerment Finding itself, prior to EPA's adoption of protective GHG standards. Like Scenario B, Scenario C also corrects for flatlining emissions after 2055, as discussed in section IV.B.3, and the exclusion of nitrous oxide and methane emitted by motor vehicles, as discussed in section IV.B.5.

For all scenarios, we present results in 2050 and 2100, as does EPA, and also in 2200, which permits a fuller evaluation of the impacts of the Final Rule, illustrating the impacts of the errors described in IV.B.4 on EPA's futility analysis. In the limited time available, we were unable to model HFC emissions changes. However, as explained above, U.S. vehicles emit HFCs, and the GHG program has played a significant role in reducing HFC emissions, so a complete evaluation of the potential impacts of vehicle GHG regulation would require considering HFCs as well.

As explained in sections IV.A-B and our comments, we do not believe that EPA's futility analysis is relevant to whether the Clean Air Act requires EPA to make an endangerment finding. We also disagree with EPA's findings that vehicle GHG emission standards are futile, the methodology EPA used to reach those findings, and EPA's conclusion that retaining vehicle GHG standards is unreasonable. Our presentation of modeling results does not imply we agree with EPA's legal premises or the methodologies in the Final Rule. Nor do we mean for our modeling to represent the definitively correct ways to evaluate the futility of U.S. vehicle GHG regulation. Rather, our modeling demonstrates that—even assuming the basic framework of EPA's modeling approach—the results are highly sensitive to parameters such as the baseline year, the final year of

[105] While it is possible that vehicle manufacturers will backslide by manufacturing dirtier vehicles in the coming years compared to today's sales as a result of the Final Rule, we do not assume backsliding in this scenario, making it a conservative analysis.

[106] This scenario attempts to recreate the fleet composition from roughly the time following the Supreme Court's decision in *Massachusetts v. EPA*, 549 U.S. 497 (2007), and through the 2009 Endangerment Finding. As we explain further in Appendix A, we assessed several years of data for this scenario to mitigate short-term noise in the vehicle market data due to the Great Recession.

analysis, emissions inputs assumptions, and so forth. The mutability of the results further highlights the arbitrary nature of EPA's reliance on only one modeling scenario, calculated based on a single set of assumptions, and never subjected to public scrutiny through notice-and-comment, to determine that all vehicle GHG regulations—past, present, and future—are facially futile. In sum, our modeling results illustrate that, even assuming EPA's basic approach, the Agency's analysis and conclusions are severely flawed and EPA would likely reach different conclusions if the Agency reconsidered the issues raised in this petition.

2. Petitioners' modeling results

The balance of this section summarizes our modeling results. Tables 1-3 below present the contribution of U.S. on-road vehicles to emissions, and to changes in global CO_2 concentrations, global average surface temperature, and global sea level rise, for each of Scenarios A, B, and C. Scenarios A and B are presented relative to a 2027 baseline, consistent with EPA's approach. Scenario C, which evaluates the impacts of U.S. vehicle emissions had EPA never issued the 2009 Endangerment Finding or subsequent GHG regulations, is presented relative to a 2009 baseline.

Table 1. Scenario A: EPA Emissions Inputs – U.S. On-Road Vehicles Contribution

	2027	2050	2100	2200
Emissions (CO_2 MMT/yr)†	1,626	1,390	1,376	1,376
Median change in global CO_2 concentrations relative to 2027 (ppmv)	-	3.2 (4.5%)*	9.7 (5.9%)	22.5 (11.2%)
Median change in global surface temperature relative to 2027 (°C)	-	0.014 (2.4%)	0.045 (3.0%)	0.115 (5.8%)
Median change in global sea level rise relative to 2027 (cm)	-	0.07 (0.6%)	1.45 (1.9%)	6.39 (2.5%)

*The parentheticals indicate percentage of U.S. on-road vehicle contribution relative to total anthropogenic values since 2027.

† The emissions in this table are listed as CO_2 instead of CO_2e because we only modeled a change in CO_2 for Scenario A, consistent with EPA's emission inputs.

Table 2. Scenario B: Today's Fleet Composition – U.S. On-Road Vehicles Contribution

	2027	2050	2100	2200
Emissions (CO_2e MMT/yr)	1,553	1,495	1,978	2,818
Median change in global CO_2 concentrations relative to 2027 (ppmv)	-	3.1 (4.4%)*	11.4 (6.9%)	33.3 (16.6%)
Median change in global surface temperature relative to 2027 (°C)	-	0.014 (2.4%)	0.053 (3.6%)	0.170 (8.6%)
Median change in global sea level rise relative to 2027 (cm)	-	0.07 (0.6%)	1.61 (2.1%)	8.32 (3.3%)

*The parentheticals indicate percentage of U.S. on-road vehicle contribution relative to total anthropogenic values since 2027.

Table 3. Scenario C: Pre-GHG Protection Fleet Composition – U.S. On-Road Vehicles Contribution

	2009	2027	2050	2100	2200
Emissions (CO_2e MMT/yr)	1,743	2,085	2,250	2,901	4,144
Median change in global CO_2 concentrations relative to 2009 (ppmv)	-	3.1 (6.4%)*	7.3 (6.2%)	19.5 (9.1%)	51.4 (20.7%)
Median change in global surface temperature relative to 2009 (°C)	-	0.015 (2.7%)	0.036 (3.2%)	0.094 (4.7%)	0.269 (10.7%)
Median change in global sea level rise relative to 2009 (cm)	-	0.04 (0.72%)	0.29 (1.7%)	3.57 (4.4%)	14.37 (5.5%)

*The parentheticals indicate percentage of U.S. on-road vehicle contribution relative to total anthropogenic values since 2009.

Petitioners' modeling results demonstrate several things. First, EPA failed to adequately document its data and methodology, rendering its results not reproducible by the public and violating both the legal requirements of CAA section 307(d) and prevailing scientific norms. Specifically, although Scenario A is meant to reproduce EPA's modeling through 2100, Petitioners were unable to reproduce EPA's projected global temperature and sea level impacts because the Agency hid from the public much of what it did. For example, although EPA purported to project temperatures based on emissions from 2027-2100, EPA only revealed the emissions inputs for 4% of those years, requiring the public to figure out what the Agency used for the remaining 96% of emissions inputs. Furthermore, although EPA purported to run four models—OMEGA, MOVES5, FaIR, and BRICK—the Agency only disclosed crucial modeling files for just one of the four models (OMEGA), leaving the public to try to recreate how EPA ran the remaining three models.[107] EPA also did not disclose many of the key parameters that would have enabled Petitioners to reproduce EPA's model runs. For example, although each model gets version upgrades as science improves (just like phones and computers get upgrades), EPA did not disclose the model version of BRICK that it used.

Assuming that EPA in fact ran the models as it claims, all such data and modeling files were unquestionably within its possession. But the Agency hid this critical information from the public, making it infeasible for the public to truly know what the Agency did or to precisely reproduce the Agency's results for purposes of public critique. Notwithstanding the Agency's severe procedural failures, Petitioners' scientific and technical experts were able to reproduce results similar to and consistent with the Agency's findings, and we believe that comparing the results in Scenarios A-C reasonably illustrates EPA's failure to adequately account for the climate change impacts of U.S. vehicle GHGs and the arbitrary nature of EPA's reliance on only one modeling scenario.[108]

Second, the results quantitatively demonstrate Petitioners' arguments above: that the projected emissions, temperature impacts, and sea level impacts are highly sensitive to starting assumptions and methodologies. This reinforces both the gravity of EPA's procedural error in not

[107] While EPA did provide MOVES5.R1 and MOVES5.R2 modeling files upon Petitioners' request to the EPA Docket Center, the outputs from these provided files do not match EPA's stated emission values in its futility analysis.

[108] *See* Appendix A (explaining Petitioners' methodology).

providing the public with notice and opportunity to comment on these key data and methodological assumptions, as well as the substantive arbitrariness of EPA's determinations. For example, considering Scenario A (EPA Emissions Inputs), projected global temperature impacts more than double from 0.045 °C in 2100 to 0.115 °C in 2200, while sea level impacts more than triple from 1.45 cm in 2100 to 6.39 cm in 2200.[109] The impacts balloon even further in Scenario C, which evaluates a vehicle fleet composition from the era prior to EPA GHG regulation: had EPA never regulated U.S. vehicle GHGs, climate emissions from U.S. vehicles could have elevated temperatures by 0.269 °C and sea level by 14.37 cm by 2200.

Third, these impacts are grave. For instance, a projected temperature increase of 0.269 °C is just shy of half a degree Fahrenheit (0.484 °F). This exceeds the total warming caused by all human activities across the globe over the last decade,[110] and approximates one-quarter of all global warming since the start of the Industrial Revolution.[111] Similarly, the projected sea level rise of 14.37 cm by 2200 is equal to 5.66 inches, or nearly half a foot of sea level rise. This is more than three-quarters the total global sea level rise since 1900.[112] To put this in context, studies suggest that even an increase of as little as 10 cm in sea level rise could *double* flooding frequency in major U.S. cities, such as Seattle, San Francisco, and Los Angeles.[113] It bears remembering that this represents potential impacts from just *one* portion of *one* sector from *one* country—the U.S. on-road transportation sector—yet the resulting harms to our global climate are staggering. Far from *de minimis* impacts, EPA's rescission of its section 202(a) GHG authority threatens to turn the U.S. vehicles sector into the single largest source of climate pollution in the whole world.

Fourth, as explained already in Section IV.B.1, many American communities will bear far greater impacts than suggested by these global average figures. Global average temperature increases are not distributed evenly across space, with, for example, Arctic Alaska warming at three times the global average rate and some Northeastern states warming at nearly twice the global average.[114] A region that warms three times the above-described 0.269 °C projection would warm by 0.807 °C, or nearly 1.5 degrees Fahrenheit (1.453 °F), a palpable difference. The same is true for sea level rise, and some U.S. cities have experienced sea level rise at over twice the global average.[115] Modeling of

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[109] As explained above, these numbers are consistent with and similar to the Agency's model results, but not exactly the same given EPA's lack of transparency in its analysis.

[110] Robert Rohde, Global Temperature Report for 2025, Berkeley Earth (Jan. 14, 2026), https://berkeleyearth.org/global-temperature-report-for-2025/ ("Since 1980, the overall trend has been about +0.20 °C/decade (+0.36 °F/decade).").

[111] *See* NGO EF Comment at 100 ("The observational record as of 2020 shows an increase of approximately 1°C in global average temperature since the period 1850-1900 (when industrial activity started) . . . .").

[112] *See* NGO EF Comment at 210 ("Global mean sea level has risen about 7 inches (approximately 18 centimeters) since 1900, up from 6.7 inches reported in EPA (2009)."") (quoting NASEM 2025 Climate Report).

[113] *See* Appendix B at 11 (citing Sean Vitousek et al., *Doubling of coastal flooding frequency within decades due to sea-level rise*, 7 Sci. Rep. 1399 (2017), https://doi.org/10.1038/s41598-017-01362-7, and concluding that "[t]his research highlights how even 10 cm of SLR doubles flooding potential along the west coast of the US, including Seattle, San Francisco and Los Angeles").

[114] *See* Appendix B.

[115] *See* Appendix B.

local sea level rise along the U.S. coast of the Gulf of Mexico demonstrates that the Gulf is projected to suffer substantially greater local sea level rise impacts than the global average. For example, assuming EPA's emissions inputs (Scenario A), we project that the impact of U.S. vehicle emissions on local sea level rise in the Gulf could reach 3.7 cm by 2100, far exceeding the global average impact of 1.45 cm.[116] By 2200, we find that the impact on Gulf local sea level rise could rise up to 55.5 cm, in a scenario where EPA never regulated vehicle GHGs (Scenario C). This is equivalent to 21.9 inches, or over 1.5 feet—a truly staggering amount of sea level rise. Further, even apparently "small" global average temperature increases can yield severe increases in the intensity and frequency of extreme weather, such as hurricanes, droughts, rainfall, heatwaves, wildfires, and floods, with devastating impacts for human health and welfare.[117] And vulnerable populations, such as economically and socially disadvantaged communities and Indigenous or minority populations, are especially vulnerable to climate change.[118]

Finally, to monetize the harms of U.S. vehicle GHG emissions, Petitioners also evaluated the social costs of GHGs (SC-GHG). In response to the proposal, commenters already presented overwhelming evidence that EPA's proposed repeal would cause massive health and welfare harms quantifiable through SC-GHG.[119] Petitioners calculated SC-GHG assuming the Final Rule's methodology of projecting emissions, global temperature, and sea level impacts to further illustrate the massive health and welfare harms caused by U.S. vehicle GHG emissions. As detailed in Appendix A, we project that EPA's estimated level of U.S. vehicle GHGs will cause $17.6 *trillion* in global climate change damages through 2100.[120] Addressing the errors in EPA's modeling as explained earlier in section IV, these damages increase to as much as $38.9 trillion by 2200, in a scenario where EPA never regulated vehicle GHG emissions.[121] For context, the entire U.S. economy's Gross Domestic Product in 2024 was $28.75 trillion.[122] Thus, through 2200, U.S. vehicle GHG emissions could cause damages to society exceeding the annual economic output of the entire United States. Obviously, this is massive harm.[123]

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[116] *See* Appendix D. Due to the specifications of our local sea level rise model, our modeling of Gulf of Mexico local sea level rise is relative to a 2030 baseline, such that these projected impacts occur over a shorter timeframe than the global sea level rise, which we modeled relative to a 2027 baseline for Scenario A and relative to a 2009 baseline for Scenario C. Were we to model Gulf of Mexico local sea level rise relative to a 2027 or 2009 baseline, we would likely project even greater impacts.
[117] *See* Section IV.B.1 and Appendix B.
[118] *See* NGO Vehicles Comment at 159-61.
[119] *See, e.g.*, NGO Vehicles Comment.
[120] As we explain in Appendix A, this calculation is based on Scenario A (EPA Emissions Inputs), EPA's 2023 updated approach to calculating social costs of GHGs (SC-GHG), and a 2% discount rate.
[121] *See* Appendix A. This presents results for Scenario C applying the SC-GHG methodology at a 2% discount rate.
[122] World Bank Group, *GDP (current US$) - United States*, https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=US (last accessed Apr. 14, 2026).
[123] These figures do not account for other sources of harm associated with fewer clean vehicles, such as criteria pollutant damages, lost consumer fuel savings, energy security harms, and more.

D. EPA's "illustrative" 50% scenario is arbitrary and capricious.

The Final Rule posits an "illustrative" 50% reduction scenario where the Agency arbitrarily reduces the global temperature and sea level rise impacts by 50%.[124] Although EPA putatively presents this scenario for "illustrative" purposes only, and only in the preamble text without any technical documentation, the Agency's futility finding relies critically on it. Notably, EPA claims that "courts have consistently viewed impacts of 1% as *de minimis*"[125] (an erroneous assertion we further critique in section V.B below). The Agency's actual modeling of the impacts of U.S. vehicle GHG emissions on global temperature and sea level rise—without the 50% reduction—shows the impacts are approximately 3% for global temperature and 2% for global sea level rise, both of which exceed EPA's stated 1% threshold. Only by applying this so-called "illustrative" scenario does EPA then claim that the potential impacts of regulation are "approximately 1% of the model-projected change in global temperature for 2050 and 2100" and "much less than 1% of the change in global sea level rise modeled for 2050 and 2100."[126] Thus, far from being merely "illustrative," EPA's scenario is the critical linchpin of its futility finding—without this arbitrary 50% reduction, even EPA's own numbers would defeat its *de minimis* argument at the Agency's own threshold. This scenario is fatally flawed, both in its arbitrary selection of a 50% reduction and in its seemingly back-of-the-napkin methodology for estimating global temperature and sea level rise. The lower contribution numbers derived from the illustrative methodology, moreover, compound the flaws made in EPA's original modeling of all U.S. vehicle emissions; corrections to that modeling produce significantly greater contributions, even after applying a 50% reduction.

First, EPA's 50% emissions reduction is irrational. The Agency claims that reducing the total impacts of the U.S. vehicle sector is appropriate given the time required for fleet turnover and given that the reductions required by the latest tranche of vehicle GHG emission standards adopted in 2024 (i.e., MY2027 and later standards) are approximately 50% of those achieved under the preexisting GHG standards (for MY2026). The Agency then alleges that the appropriate reduction for a "likely real-world scenario" "turns on a variety of factors that are difficult to predict, including our regulatory decisions for MY 2032 and beyond, separate regulatory influences, and changes to the underlying economics, technologies, and consumer preferences."[127] EPA further opines that the illustrative scenario does not "reflect what [GHG] standards would realistically achieve given technical and statutory constraints" and thus is "likely an overestimation" of actual impact.[128]

None of these rationales sufficiently explain a 50% reduction, and they only further demonstrate the fundamental conceptual flaws in EPA's methodology. As we explained in section IV.B.4, the presence of fleet turnover means that the modeling is sensitive to the analytical timeframe, such that a longer timeframe more accurately captures the full impacts of U.S. vehicle GHGs, and EPA acted arbitrarily in only considering 2050 and 2100 endpoints. Moreover, there are well-established methodologies for calculating the rate of fleet turnover, including the methodologies applied by EPA in its MOVES model. Applying those methodologies, we can quantify the emissions attributable to new MY2027 and later vehicles in any given year, which we

[124] 91 Fed. Reg. at 7732.
[125] *Id.* at 7733. EPA's 1% *de minimis* threshold is also arbitrary, as we explain in section V.B.
[126] *Id.*
[127] *Id.* at 7732.
[128] *Id.*

present below and detail in Appendix A.

Table 4. Scenario A: EPA Emissions Inputs – Proportion of Cumulative CO_2 Emissions Attributable to New MY2027 and Later Vehicles by Year (%)

Year	Proportion
2050	61%
2100	87%
2150	92%
2200	94%

Table 4 shows that by 2050, the cumulative CO_2 emissions from MY2027 and later vehicles are already 61% of the total on-road vehicle emissions through that year. This number grows over time, reaching over 87% by 2100 and 94% by 2200. These numbers far exceed EPA's 50%.

The Agency's second rationale for the 50% reduction is that the 2024 rules established standards that phased-in through MY2032, and that those standards approximate a 50% reduction from the preexisting standards for MY2026.[129] While the efficacy of the 2024 rules relative to the prior GHG rule baseline may be relevant to determining the reasonableness of the 2024 rules themselves, there is no reason for using an approximation of this value to evaluate whether GHG regulation generally would be futile. As we explained in section IV.B, EPA is not merely determining that a prospective regulation of GHGs that requires a 50% emissions reduction is unreasonable. It instead uses this analysis to justify that any past, present, or future section 202(a) GHG emissions standards would be futile, and to repeal all existing GHG rules.

Moreover, it is illogical to treat the MY2026 standards as the baseline because the Agency is repealing those very standards in this rule. The same applies to treating any earlier standard as the baseline. Rather, an appropriate baseline would be *the complete absence* of any GHG regulation, both now and in the past, since EPA is eliminating all such GHG regulations and disclaiming authority to issue any such regulations in the future based on the purported "futility" of that regulatory scheme.[130] Moreover, the reductions achievable by the 2024 rules are unlikely to be the maximum reductions achievable over the course of the GHG program. Just as the Agency has developed increasingly more protective standards over the past 15 years based on evolving pollution control technologies, a future Administrator could set more protective standards than the 2024 rules.

EPA's 50% reduction thus reflects (imprecisely) specific prior regulatory choices based on facts that existed at those times, not any inherent limitation on statutory authority. A future Administrator might reasonably project greater emission reductions as technology advances, consistent with EPA's historical exercise of section 202(a) to achieve greater than 99% reductions of

[129] The Agency also explains that the standards for each vehicle category vary, for example with 50% CO_2 reduction projected for LD vehicles, 41% for MD vehicles, and 25-60% for HD vehicles depending on subcategory. *See* 91 Fed. Reg. at 7732 & n.180.

[130] As we explained above in section IV.C, our Scenario C is one way to assess this.

certain pollutants.[131] The quantum of emission reductions driven by a future GHG standard would continue to depend on relevant facts—such as technological feasibility, costs, consumer choice, infrastructure availability, and so forth. EPA's Final Rule disclaims all authority to establish GHG standards on the theory that standards are futile under any circumstance, meaning that the Agency must contend with the impacts of doing just that, not merely a crude approximation of the impacts of the 2024 rules.

The Agency's methodology for deriving global temperature and sea level rise impacts under this illustrative scenario is also arbitrary. Indeed, it is unclear what analysis the Agency has even performed. EPA's technical memorandum on global temperature and sea level rise modeling does not discuss the illustrative scenario.[132] The emissions inputs for this scenario are nowhere to be found—for example, it is unclear if the Agency meant to model a 50% emissions reduction in each year beginning in MY2027, or if those emissions reductions are weighted more in later years consistent with its fleet turnover rationale.[133] And it appears the Agency did not perform global temperature or global sea level rise modeling for this scenario at all; instead, it merely multiplied the modeled global temperature and sea level rise outputs for the original scenario (of eliminating all U.S. vehicle emissions) by 50%. But as EPA's own preamble explains, global temperature and sea level rise impacts are the product of highly complex physical climate processes that the Agency's chosen models emulate.[134] So even assuming a 50% emissions reduction scenario would be appropriate as an input to the BRICK and FaIR models, it is arbitrary to just scale modeled outputs for a different emissions scenario by 50%. EPA cannot reasonably claim those values represent the impacts of vehicle GHG regulation on global temperature and sea level rise. There is no justification for substituting the sophisticated modeling tools EPA is using in the same section of the Final Rule with an exogenous, back-of-the-napkin guess that conveniently produces the very result that EPA is aiming to manufacture.

EPA's cursory justification of its methodology is baseless. The Agency admits that using the illustrative scenario to examine global temperature and sea level rise impacts "pairs some analytic tools not intended for this purpose with other tools in the literature" and "cannot be assumed to translate with precision directly to specific adverse health or welfare impacts."[135] In plain English, that means the illustrative results were produced by a method not intended for this purpose and do not actually mean the thing the Agency wants them to mean. That is, the results are wrong.

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[131] *See* 89 Fed. Reg. at 27893-95. The statute, moreover, contemplates not merely the "control" of emissions but their "prevent[ion]," 42 U.S.C. § 7521(a)(1), "that is, the reduction or elimination, through any measures, of the amount of pollutants produced or created at the source," *id.* § 7401(a)(3).

[132] *See* EPA Temperature Memo.

[133] As explained in section IV.B.4, the timing of emissions significantly affects their contribution to physical climate changes.

[134] *See* 91 Fed. Reg. at 7729 (explaining how FaIR models the complex physical processes and uncertainties associated with climate change, including "atmospheric and ocean temperatures and emissions of other gases," "radiative forcing from greenhouse gases, aerosols, albedo changes due to land use, solar cycles, and volcanic eruptions," "the sensitivity of climate to increases in atmospheric CO2 concentrations, forcing from aerosol interactions with radiation and clouds, forcing from black carbon on snow, and carbon cycle parameters"); *id.* (analogous explanation for BRICK).

[135] 91 Fed. Reg. at 7732.

Finally, the low contribution numbers in EPA's illustrative scenario are the product of compounding errors with its original modeling. In Table 5, we show global temperature and sea level impacts reduced by 50% for each of the three scenarios we modeled, in 2100 and 2200.[136]

Table 5. All Scenarios – 50% Reduction of Global Temperature and Sea Level Rise Changes, in 2100 and 2200, Absolute Values and Percentages Relative to Baseline SSP2-4.5

	2100	2150	2200	2100	2150	2200
Global Mean Surface Temperature	Absolute values (°C)			Percentages*		
Scenario A: EPA Emissions	0.023	0.040	0.058	1.52%	2.21%	2.91%
Scenario B: Today's Fleet	0.027	0.053	0.085	1.79%	2.94%	4.30%
Scenario C: Pre-GHG Protection Fleet	0.047	0.086	0.135	2.33%	3.73%	5.35%
Global Sea Level Rise	Absolute values (cm)			Percentages*		
Scenario A: EPA Emissions	0.73	1.81	3.20	0.95%	1.10%	1.26%
Scenario B: Today's Fleet	0.81	2.14	4.16	1.06%	1.30%	1.65%
Scenario C: Pre-GHG Protection Fleet	1.79	4.13	7.19	2.20%	2.45%	2.75%

*Percentages for Scenarios A and B are compared against the SSP2-4.5 increase in temperature relative to 2027. For Scenario C, the percentages are calculated against the SSP2-4.5 increase in temperature relative to 2009. Those values are included in Appendix A.

As with our modeled results presented in section IV.C, the 50% reduction values are highly sensitive to the different methodological assumptions and parameters, none of which EPA subjected to notice-and-comment. The resulting percentage contributions to temperature and sea level changes in 2100 and later years exceed EPA's alleged 1% threshold in all cases except one: EPA emissions Scenario A for global sea level rise in 2100, which falls just shy of 1% (0.95%). However, even assuming EPA's emissions inputs, a 50%-reduced contribution of U.S. vehicles to temperature changes exceeds 1% (1.52%) in that same year, and the 50%-reduced contribution to both temperature and sea level rise changes also exceeds 1% by 2150. We note, moreover, that EPA's own modeling actually shows 50%-reduced contribution exceeding 1% in 2100 for both temperature and sea level rise.[137] Of course, the actual modeled impacts (absent EPA's arbitrary 50% reduction)

[136] Consistent with the text, our presentation of these 50% reduction values does not imply our support for EPA's methodology here: it is clearly wrong to simply reduce modeled temperature and sea level rise impacts by 50%. We are only presenting these 50% reduction values to demonstrate that even following EPA's general methodology, the results generally exceed the Agency's preferred 1% *de minimis* threshold.

[137] Specifically, EPA reports a temperature change of 0.019 °C in 2100, relative to a 1.28 °C baseline, and a sea level rise of 0.7 cm in 2100, relative to a 69.5 cm baseline. These equate to 1.48% and 1.01% respectively, such that both figures exceed 1%. As we explained in section IV.C, we were unable to reproduce EPA's exact values given the Agency's lack of transparency in documenting the analysis that it performed. Nonetheless, EPA's own values further reinforce that the impacts are not *de minimis*.

significantly exceed 1% in 2100 and later years.[138]

Further, certain scenarios show results much greater than 1%. For example, if EPA had never regulated vehicle GHGs (Scenario C), the 50%-reduced temperature impacts attributable to U.S. vehicle GHGs could rise to as high as 5.35% by 2200. This is over five times higher than EPA's supposed 1% threshold. Even assuming EPA's methodology, this is obviously not *de minimis*.

V. EPA'S NEW *DE MINIMIS* COMPARISON METRICS ARE ARBITRARY AND CAPRICIOUS.

EPA's Final Rule advances three new metrics against which it compares the impacts of U.S. vehicle emissions, none of which the public had an opportunity to comment on: (i) the "range of measurability" for global temperature and sea level rise, (ii) global temperature "variability" from 2016-25, and (iii) a 1% *de minimis* threshold it claims has been recognized by courts. Section V.A demonstrates that EPA's comparisons between U.S. vehicle impacts with its first two "measurability" and "variability" metrics are fundamentally flawed and conflate distinct technical concepts. Further, EPA's calculated or cited numbers (and in at least one case, the failure to cite any number) for these comparative metrics are erroneous. Adjusting for these errors results in far smaller variability and measurement uncertainty numbers, such that EPA's projected U.S. vehicle GHG impacts on global temperature and sea level rise exceed the relevant variability and measurement metrics. For example, EPA's projected 2100 global sea level rise impact of 1.4 cm is *3.5 times* the 0.4 cm global sea level rise measurement uncertainty reported by NASA. When we address both the modeling errors and the variability and measurement uncertainty errors, we identify impacts that far exceed the comparators, including by more than an order of magnitude. Thus, even hypothetically assuming the propriety of EPA's methodology, the agency erred in determining that U.S. vehicle impacts were *de minimis*. Section V.B demonstrates that the third comparative metric, the 1% threshold, and EPA's process for deriving that metric are arbitrary and inconsistent with precedent.

A. EPA's new measurability and variability metrics are arbitrary.

We begin with our conceptual critiques of EPA's "measurability" and "variability" metrics, which suffer from similar flaws as identified in our comments.[139] It is not entirely clear what EPA means by these terms, which it describes using various related but distinct terms, such as:

- "the standard margin of error,"[140]
- "the accepted variability in GMST and GSLR measurement,"[141]
- "the range of inherent variability in measurement for trends in GMST and GSLR,"[142]

[138] See section IV.C.
[139] *See* NGO Vehicles Comment at 104-10.
[140] 91 Fed. Reg. at 7688.
[141] *Id.* at 7691.
[142] *Id.* at 7711.

- "the range of measurability,"[143]
- "variability,"[144] and
- "a measurable, material impact on trends in global temperature or sea level."[145]

EPA fails to detail its methodology for deriving or defining any of these comparative metrics, so it is not clear what they represent. The preamble does report two sets of numerical values. It claims that "GMST variability from 2016–2025 was 0.14 °C" based on a NOAA website.[146] In a footnote, it also claims that a separate NOAA website "estimate[es] uncertainty in annual global mean surface temperature of approximately ±0.05 °C since 1950, increasing to ±0.1–0.2 °C in the late 19th Century."[147]

Our review, however, did not locate in EPA's cited NOAA sources any of the figures reported in the preamble.[148] We also carefully reviewed EPA's supporting record, including the EPA Temperature Memo that explains the methodology for estimating global temperature and sea level rise impacts, and EPA's Regulatory Impacts Analysis, the document that would typically detail key technical methodologies. But we could not identify any supporting material that explained how these numbers were calculated or what precisely they mean. Furthermore, although EPA claims that the estimated impacts on global sea level rise fall below the range of measurability,[149] we could not identify in the record either the methodology for calculating the range of global sea level rise measurability or even what EPA believes that number to be, beyond the Agency's implication that it is lower than the projected global sea level rise impact of 1.4 cm. Given the critical importance of these comparative metrics for EPA's futility findings, the agency's introduction of them in the final rule without any notice and comment, and its utter lack of transparency as to what these comparative metrics are or how they were derived, are arbitrary and capricious.

Before we further critique EPA's calculations, we first explain what the terms "variability" and "measurability" mean in relation to global temperatures. They are two distinct concepts. Climate variability is a property of the physical climate system itself. For example, global temperature variability refers to the actual physical fluctuations in average surface temperature over a specific time range. These fluctuations occur over multiple time scales—such as the daily time scales from the Earth's rotation; the yearly to multidecadal time scales of the El Niño Southern Oscillation (ENSO), the Pacific Decadal Oscillation (PDO), the Atlantic Multidecadal Oscillation (AMO), and solar cycles; up to the century or millennial time scales of anthropogenic forcings from GHG

[143] *Id.* at 7733.
[144] *Id.*
[145] *Id.* at 7721.
[146] *Id.* at 7733 & n.182.
[147] *Id.* at 7733 n.181.
[148] *See, e.g., id.* at 7733 & nn.181-82.
[149] *Id.* at 7732-33.

emissions.[150] Variability thus encompasses both short-term as well as long-term dynamics.[151] However, over longer time scales, the effects of anthropogenic climate change will dominate over the short-term fluctuations. In relation to EPA's analysis, variability captures both the desired signal (i.e., U.S. vehicle policy impacts) and surrounding noise (e.g., El Niño patterns).

By contrast, measurability is an observational and epistemic question—how precisely and accurately can we determine temperature at a given point or over a given period?[152] Measurability is affected by numerous factors, such as spatial coverage gaps (e.g., the relative lack of sensor stations in the Arctic, Southern Ocean, and parts of Africa), inhomogeneities in the records for particular stations (e.g., changes in the instruments used by that station, changes in location of the stations, time-of-observation biases in when temperatures are measured), differences between sea surface temperature datasets, and the statistical methods used to infill or interpolate.[153] Measurability defines the uncertainty envelope around estimates of what the temperature actually was. Measurability has also improved significantly over time and continues to improve with updates to instruments and methodologies.

To be clear, variability and measurability mean two completely different things. Variability refers to changes in the climate system itself. Measurability refers to how precisely and accurately we measure that system.[154] EPA suggests that both variability and measurability can be conflated into a "margin of error" such that impacts below such a threshold are meaningless. But this is conceptually

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[150] *See, e.g.*, Veronika Eyring et al., *Human Influence on the Climate System*, in Climate Change 2021: The Physical Science Basis, Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, at 436, 502, 515 (Valérie Masson-Delmotte et al. eds., 2021), https://www.ipcc.ch/report/ar6/wg1/chapter/chapter-3/.

[151] *See id.* at 517.

[152] *See, e.g.*, C.P. Morice et al., *An updated assessment of near-surface temperature change from 1850: the HadCRUT5 data set*, 126 J. of Geophysical Rsch.: Atmospheres 1, 2 (Feb. 2021), https://doi.org/10.1029/2019JD032361.

[153] *See id.* at 2-3, 15.

[154] Global sea level rise variability and measurability occur due to a different set of factors than for global temperature; however, the basic distinction between variability and measurability remains the same. Global sea level rise variability is a property of the ocean-ice-land system and refers to the actual physical fluctuations in average sea level over time—driven by factors like thermosteric expansion (ocean heat uptake), mass loss from ice sheets (Greenland, West and East Antarctica) and glaciers, changes in land water storage, and shorter-term dynamics like ENSO-driven redistribution of ocean mass and heat. By contrast, global sea level rise measurability refers to how precisely and accurately we can determine sea level at a given point or over a given period. This depends on other factors such as the uneven spatial distribution of tide gauges (concentrated along developed coastlines, sparse in the Southern Hemisphere and open ocean), corrections for vertical land motion (e.g., tectonic, sediment compaction, glacial isostatic adjustment), the calibration, reference frame stability, and inter-mission continuity of satellite altimetry records, and the statistical methods used to reconcile tide gauge and altimetry records into a coherent global mean. *See generally* Thomas Frederikse et al., *The causes of sea-level rise since 1900*. 584 Nature 393 (2020), https://doi.org/10.1038/s41586-020-2591-3; Josh Blumenfeld, *The Precision Behind Sea Level Rise,* NASA EarthData (last updated Jan. 16, 2025), https://www.earthdata.nasa.gov/news/feature-articles/precision-behind-sea-level-rise.

wrong, as variability is not a "margin of error" of global temperature; it *is* the changes in global temperature itself. By contrast, measurability can be properly understood as a margin of error in our ability to measure global temperature.

Both concepts are also completely distinct from whether reducing emissions and corresponding global temperature (or global sea level rise) changes have a material impact on human health and welfare. Commenters clearly explained the distinction between margin of error and the materiality of emission reductions.[155] In brief, suppose one were to project that in a given future year global temperature is 60 degrees, ±2 degrees, for a range of 58-62 degrees. This does not mean that a policy that reduces global temperature by 1 degree is futile, as that policy would still shift the projection to 59 degrees ±2 degrees, for a projection band of 57-61 degrees. That 1-degree reduction is plainly material given the entire band of projected outcomes shifts down by 1 degree. Moreover, as explained above, a 1degree change does not translate into the whole world becoming 1 degree cooler all the time, but rather manifests as significantly reduced incidence and intensity of local extreme weather and other unevenly distributed climate events that pose catastrophic danger to human health and welfare. EPA's conflation of measurability, variability, and the materiality of emissions reductions is irredeemably arbitrary.

1. EPA's measurability and variability values are arbitrary.

Even hypothetically accepting EPA's irrational framework, the agency's calculations for measurability and variability are technically flawed. In this section we detail such flaws and show that addressing them would yield significantly lower variability and measurability figures, such that even assuming EPA's general methodology, U.S. vehicle impacts would exceed those figures and not be *de minimis*. This below summarizes our analysis, which we further detail in Appendix C.

As with our earlier analysis, we do not intend to suggest that our figures are the appropriate metrics by which to evaluate the materiality of U.S. vehicle impacts on health and welfare; as explained above, EPA's conceptual framework for determining futility is *a priori* contrary to law and arbitrary and capricious. Comparing projected impacts of U.S. vehicle GHGs on global temperature and sea level rise with variability and measurability metrics is, at bottom, a flawed apples-to-oranges comparison. No amount of patching over the calculations can redeem what is fundamentally unsound. If anything, the fact that the ultimate finding of futility is so sensitive to the diversity of datasets, statistical techniques, and assumptions described below only further highlights the arbitrary nature of EPA's methodology.

Beginning with measurability, EPA posits that "the predicted impacts through 2100 (0.013 °C as shown in Table 5) are below the range of measurability for GMST and likewise for GSLR (1.4 cm as shown in Table 7)."[156] To begin with, this sentence has a typo, as Table 5 actually shows a projected impact of 0.037 °C for global temperature through 2100, not 0.013 °C, such that EPA understates impacts by nearly three-fold relative to what the agency's own analysis projects. EPA then claims that a NOAA data source "estimate[es] uncertainty in annual global mean surface temperature of approximately ±0.05 °C since 1950, increasing to ±0.1–0.2 °C in the late 19th

[155] *See* NGO Vehicles Comment at 104-10.
[156] 91 Fed. Reg. at 7732-33.

Century."[157] As explained above, the cited NOAA webpage does not contain these figures, nor does it report other numerical figures for measurement uncertainty.

Our review of global temperature uncertainty measurements reveals lower uncertainty values, particularly in recent decades. As explained above, measurability addresses how precisely and accurately we can determine temperature at a given point or over a given period, and it has improved alongside improvements to measurement tools and scientific methodologies. Commenters demonstrated that projected temperature changes from U.S. vehicle GHGs are in fact measurable. For example, "Berkeley Earth reports a highly precise measurement of global temperature, with 95% confidence uncertainties of 0.03 °C for a single year."[158] This uncertainty level is below EPA's projected 2100 global temperature impact of 0.037 °C, indicating that even assuming EPA's preferred methodology, EPA's conclusion that U.S. vehicle emissions are *de minimis* is arbitrary and capricious.

In addition, the NOAA website referenced by the Final Rule cites to NOAAGlobalTemp data. Based on that dataset, Huang et al. (2020) reports that the uncertainty in globally averaged annual surface temperatures has gradually decreased over the twentieth century, reaching "approximately 0.02 °C in the 2010s except for spikes during the two world wars."[159] Again, this value is below EPA's projected global temperature impact of 0.037 °C, so that even assuming EPA's methodology, U.S. vehicle emissions are not *de minimis*.

We were able to identify one paper, Lenssen et al. (2019), that reported the ±0.05 °C measurement uncertainty for recent decades and between 0.1 to 0.2°C figures for the 19th century that EPA referenced.[160] However, a newer paper by Lenssen et al. (2024) updates the measurement uncertainty values to only 0.035°C.[161] Appendix C collects these and additional sources of measurement uncertainty figures. When looking at the time period since 1950, all sources of measurement uncertainty that we identified report values lower than the 0.05 °C identified by EPA. The same is true when looking at the time period since 1970, with values falling as low as

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[157] *Id.* at 7733 n.181.

[158] Comment submitted by Nathan Sweet et al. 4, Docket No. EPA-HQ-OAR-2025-0194-1461; *see also* Robert Rohde, Global Temperature Report for 2025, Berkeley Earth (Jan. 14, 2026), https://berkeleyearth.org/global-temperature-report-for-2025/; Robert Rohde & Zeke Hausfather, *The Berkeley Earth Land/Ocean Temperature Record*, 12 Earth Syst. Sci. Data 3469, at Fig. 2 (2020), https://essd.copernicus.org/articles/12/3469/2020/ ("Berkeley Earth Jan 2025 Update").

[159] Boyin Huang et al., *Uncertainty Estimates for Sea Surface Temperature and Land Surface Air Temperature in NOAAGlobalTemp Version 5*, 33 Journal of Climate 1351, 1368 (2020), https://doi.org/10.1175/JCLI-D-19-0395.1. This Huang paper is based on version 5 of the NOAAGlobalTemp dataset. As we explain in Appendix C, the latest version 6 of this dataset does not report measurement uncertainty values.

[160] Nathan J.L. Lenssen et al., *Improvements in the GISTEMP uncertainty model.* 124 J. of Geophysical Rsch.: Atmospheres 6307, 6307 (2019), https://doi.org/10.1029/2018JD029522.

[161] Figure calculated by petitioners based on data provided by author. Discussion of calculation can be found in Appendix C, citing Nathan J.L. Lenssen et al., *A NASA GISTEMPv4 observational uncertainty ensemble*, 129 J. of Geophysical Rsch.: Atmospheres 1 (2024), https://doi.org/10.1029/2023JD040179.

0.011 °C.[162]

EPA, moreover, fails to explain why it is appropriate to look at *annual* uncertainty metrics when the policies in question are long-term pollution control policies with impacts that occur over multiple decades. For example, EPA itself notes that "fleet turnover (*i.e.,* the transition from existing vehicles to new vehicles covered by the standards) generally takes more than 20 years,"[163] and for this reason, the agency continues to project regulatory impacts over a multi-decadal period.[164] And as commenters explained, global temperature measurement uncertainty can decrease when averaging time periods of greater length.[165] For example, Berkeley Earth reports five-year uncertainty values lower than annual uncertainty values (e.g., for 2022, the five-year uncertainty is 0.027 °C, while the annual uncertainty is 0.031 °C), and a thirty-year uncertainty value that is far lower than annual values (e.g., for 1951-80, the uncertainty is 0.019 °C, compared to annual uncertainties that range from 0.026-0.079 °C during that time period).[166]

Turning to global sea level rise measurement uncertainty, EPA does not report any value or methodology, beyond implying the value exceeds 1.4 cm. Our review of global sea level rise measurement uncertainty found that NASA reports annual global sea level rise uncertainties of only 4.0 mm, or 0.4 cm, per year.[167] The 1.4 cm global sea level rise change projected by EPA in 2100 is 3.5 times (i.e., 250% greater than) this measurement uncertainty value. This demonstrates that even applying EPA's preferred methodology, EPA's conclusion that U.S. vehicle emissions are *de minimis* is arbitrary and capricious.[168]

EPA's technical analysis of global temperature variability is also wrong. As explained above, the referenced NOAA website does not provide the 0.14 °C figure cited by EPA, nor does the Agency elaborate on its methodology. Our review was able to reconstruct the 0.14 °C value by taking the sample standard deviation of annual temperature data from 2016-25. For purposes of this

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[162] *See* Appendix C, Fig. 14, citing Chan et al., Dynamically Consistent Ensemble of Temperature (DCENT) (Jan. 14, 2026), https://dcent-i.github.io; DCENT_DCENT_I_GMST_annual_statistics, https://www.dropbox.com/scl/fi/c8ohkby3kbq98jyx7c7i1/DCENT_DCENT_I_GMST_annual_statistics.txt?rlkey=wt7436fexkijiqfltnvt43681&e=2&st=px7uqc2n&dl=0.

[163] 91 Fed. Reg. at 7732.

[164] EPA's RIA projects regulatory impacts through 2055.

[165] Comment submitted by Nathan Sweet et al. 4, Docket No. EPA-HQ-OAR-2025-0194-1461.

[166] *See* Berkeley Earth Jan 2025 Update.

[167] NASA, *Global Mean Sea Level*, https://sealevel.nasa.gov/understanding-sea-level/key-indicators/global-mean-sea-level/ (last visited Apr. 15, 2026). *See also* Michael Ablain et al., *Uncertainty in satellite estimates of global mean sea-level changes, trend and acceleration*. 11 Earth Sys. Science Data 1189 (2019), https://essd.copernicus.org/articles/11/1189/2019/.

[168] To the extent that EPA later identifies sources reporting higher measurement uncertainty in response to this petition, any such sources do not exist in the final rule itself and are not part of the record, and thus the agency is still required to convene a proceeding for reconsideration. In any event, any such sources cannot cure EPA's error in comparing projected emissions impacts with uncertainty values, which is a fundamentally apples-to-oranges comparison.

part of our petition, we assume this is the methodology EPA used.[169]

This methodology is fundamentally flawed for several reasons. First, standard deviation measures the amount of variation of a variable around its arithmetic average. For example, suppose the average life expectancy of adult men in the U.S. is 78 years. The standard deviation would then measure how dispersed adult male life expectancy is from the average, e.g., are the majority of men within one year on either side of the average or within ten years? However, global temperature data from 2016-25 are not intended to measure values around a stable arithmetic average. Rather, they measure the trend in temperature over time, a trend that is noticeably increasing due to anthropogenic greenhouse gas emissions. In other words, it makes no sense to pretend that the temperature values from 2016-25 are scattered around one stable average temperature, when the annual temperatures are obviously going up over time and with increasing atmospheric GHG levels, as shown in the figures below.

[169] To the extent EPA later chooses to defend its result based on another methodology for calculating the 0.14 °C figure, that methodology does not exist in the final rule, and the agency must nonetheless convene a proceeding for reconsideration.

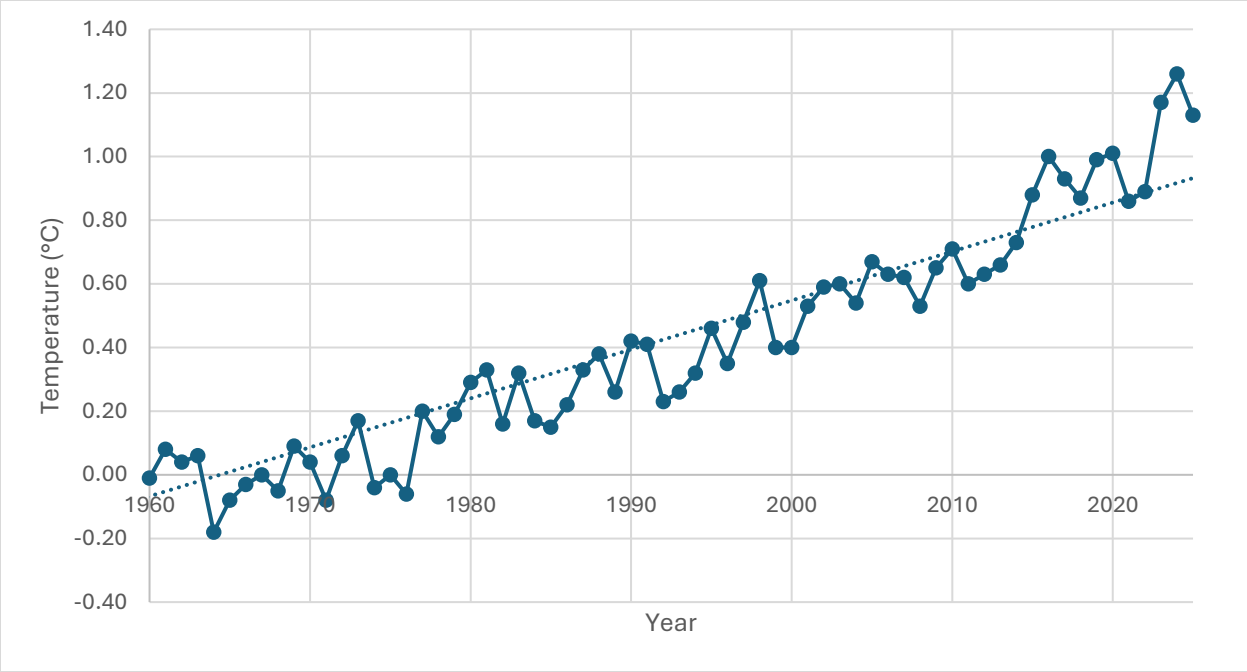

Figure 1 Global Temperature Anomalies Over Time, 1960-2025, Relative to 1901-2000 Average Global Temperature.

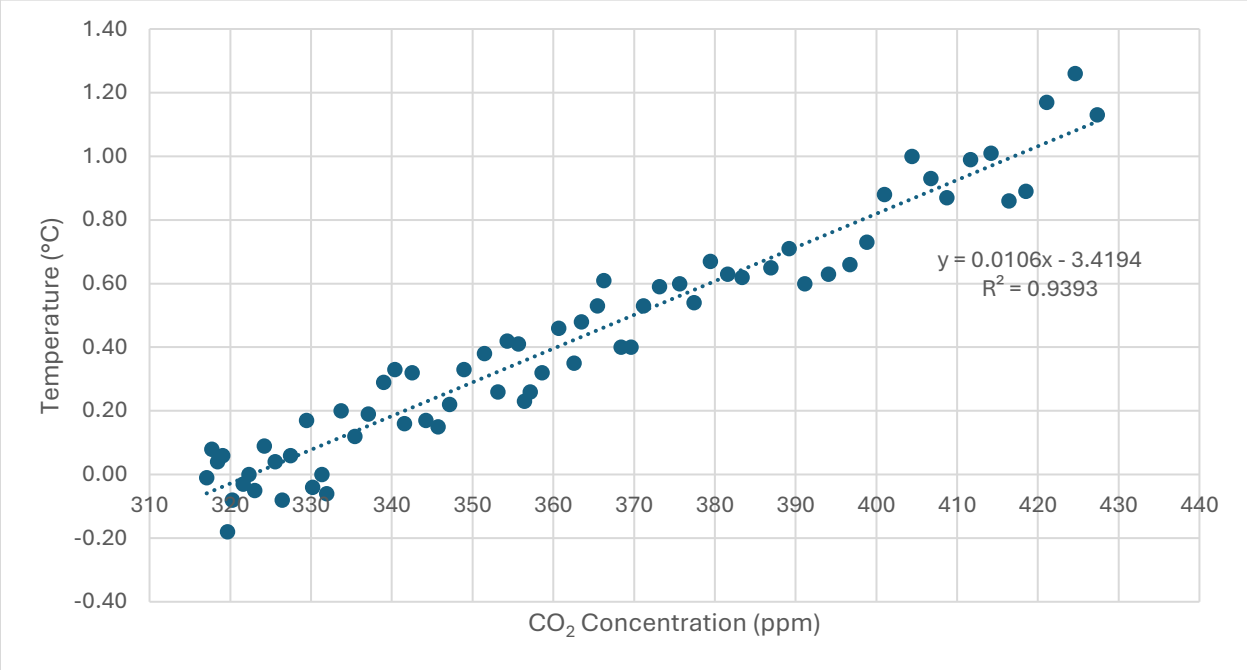

Figure 2 Global Temperature Anomalies Relative to Atmospheric CO_2 concentration (ppm), 1960-2025 Relative to 1901-2000 Average Global Temperature.

Calculating a sample standard deviation without accounting for these trends would mean that a perfectly linear increase in temperatures could have the same standard deviation as highly noisy data that bounce around each other. For example, the two lines in the figure below have the

exact same values, but they are arranged in different orders. That ordering makes a visible difference, such that the blue line displays a clear increasing trend, while the green line displays noisy datapoints that are bouncing around. But EPA's approach would mean that these two lines have the exact same variability. That makes no sense. In this case, a better metric of variability would account for the trend in the blue line and indicate that it has lower variability than the green line.

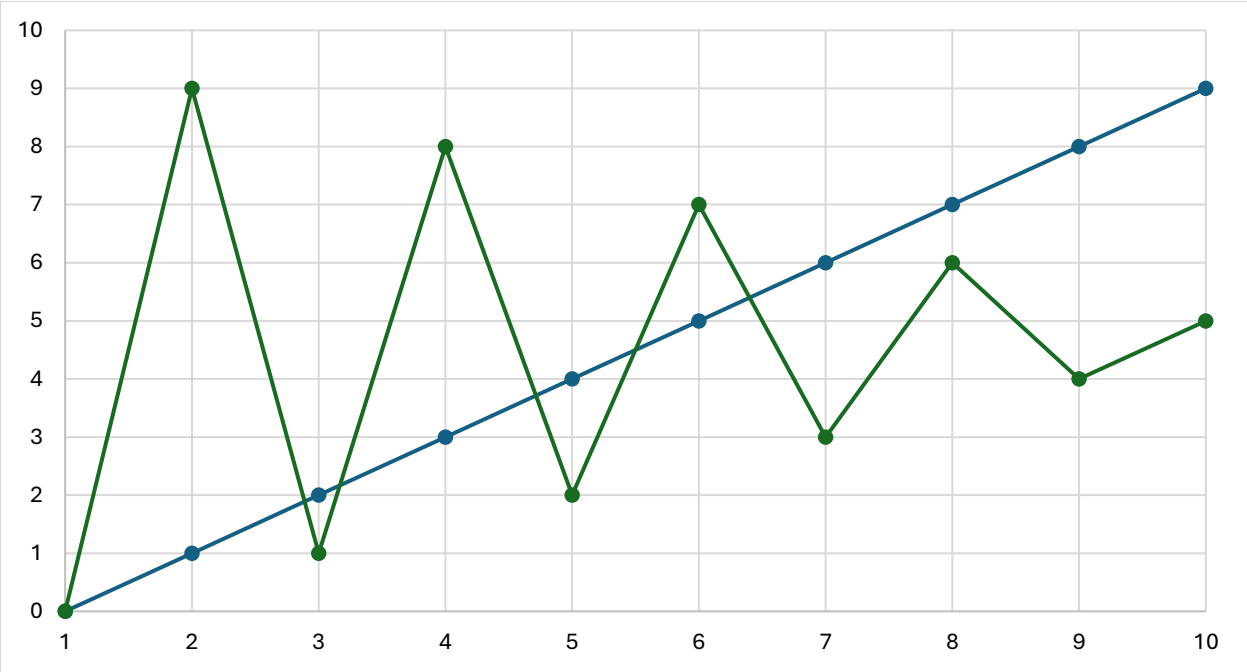

Figure 3 Two Sample Datasets (Green and Blue Dots and Lines) Showing the Importance of Accounting for Trends in Determining Variability

Second, the timeframe of the data inputs is consequential. There are two key components of this timeframe. The first component is the period across which temperatures are averaged for each datapoint, for example, whether each datapoint represents averages across one month, one year, or ten years. EPA's cited source appears to average the data across one year. The second timeframe component is the period for the analysis as a whole, including the number of years and when the analysis begins and ends. For example, EPA assesses a ten-year period beginning in 2016 and ending in 2025.

EPA does not explain why annually averaged data from the ten-year period of 2016-25 are the right inputs. The Agency's referenced NOAA website itself highlights that changing the temporal parameters can result in significantly different datasets.[170] In Appendix C, we further

[170] 91 Fed. Reg. at 7733 n.182 (citing NOAA, National Centers for Environmental Information, *Climate at a Glance: Global Time Series*, https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/global/time-series/globe/land_ocean/tavg/ytd/12/1950-2025 (last visited Apr. 15, 2026)). The cited NOAA webpage contains multiple temporal parameters that the user can adjust and that significantly affect the results, including parameters for "Time Scale," "Month," "Start Year," and "End Year."

elaborate on the sensitivity of the variability figure to these temporal parameters, showing that selection of the ten-year period from 2016-25 happens to result in unusually high variability relative to other time periods. Given that EPA is asserting that GHG regulation is facially futile, the agency is obligated to demonstrate that such futility exists not only in a single arbitrarily cherrypicked timeline but across a wide range of reasonable periods. Moreover, as commenters explained, climate change induced by increasing GHG pollution is not a short-term annual phenomenon, but rather occurs over long periods of time, as GHG pollution accumulates and causes increasing temperatures, climate volatility, and other impacts that endanger human health and welfare.[171]

To understand the variability in the long-term state of the climate, apart from short-term variations (such as the El Nino and other ocean-atmospheric oscillations described above), scientists often look at temperature data averaged over longer time periods than just one year.[172] To put it simply, while annual temperatures tell us what the atmosphere is doing right now, including in response to temporary natural cycles, longer-term assessments allow scientists to discern whether the climate is changing in more permanent ways, such as in response to climate pollution.

Moreover, annual temperatures during 2016-2025 exhibited especially high variability relative to most prior ten-year periods. EPA's selection of this time window biases variability upwards due to historically anomalous climate behavior resulting from climate change. That is, the 2016-2025 period coincides with some of the highest recorded GHG concentrations in human history. At these elevated GHG concentrations, the climate system is operating in a regime that is measurably different from earlier decades, with altered patterns of climate extremes that are themselves a consequence of the underlying warming trend. That is to say, the elevated variability during the 2016-2025 window is not random and does not merely reflect natural internal climate variability. It is at least partly a reflection of the altered climate state produced by the very GHG emissions whose regulation EPA now claims are meaningless. The Agency's argument is therefore circular: the elevated variability EPA cites as a reason not to regulate is itself a consequence of the kind of emissions that Clean Air Act section 202(a) GHG regulation is meant to address.

Third, EPA arbitrarily used the sample standard deviation in lieu of population standard deviation. The Agency purports to have calculated "variability in GMST measurement from 2016 to 2025."[173] Taking EPA at its word that it meant to calculate global temperature variability from 2016-25, the Agency should have used population standard deviation, as we know the temperature data for each year from 2016-25, i.e., the entire "population" of years. This is not a situation where we only know the temperature from a subset, or "sample" of those years, so it is statistically unsound to apply the sample standard deviation. Alternatively, to the extent EPA actually meant to calculate global temperature variability across a longer time period and relied upon 2016-25 data as a sample, the Agency erred in not choosing a random sample and in arbitrarily selecting the 2016-25 time period, which yields atypically high variability, as we further explain in Appendix C.

We calculate lower variability metrics when we address each of the above flaws, and

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[171] *See* section IV.B.4 above.

[172] NOAA, National Centers for Environmental Information, *Accounting for Natural Variability in Our Changing Climate* (Aug. 5, 2019), https://www.ncei.noaa.gov/news/accounting-natural-variability-our-changing-climate.

[173] 91 Fed. Reg. at 7691; *see also id.* at 7733 ("GMST variability from 2016–2025").

considerably lower variability when we address multiple flaws at once. For example, when we account for the relationship between temperature and atmospheric CO_2 concentrations, use 10-year averages (as opposed to annual averages) of temperature data from 1965 to 2025, and calculate population standard deviation, we determine a variability of only 0.0193 °C. This value is roughly 14% of EPA's reported variability 0.14 °C, that is, roughly 86% smaller than EPA's value. Notably, EPA's projection of U.S. vehicle GHG impacts in 2100 of 0.037 °C also significantly exceeds this value, such that even otherwise assuming EPA's general methodology of assessing temperature variability, the impacts of U.S. vehicle GHGs are not *de minimis*.[174]

2. Addressing the compounding flaws in EPA's modeling and variability and measurability metrics further illustrates the meaningful impact of U.S. vehicle GHG emissions.

EPA purports to compare modeled global temperature and sea level impacts with variability and measurability metrics. As explained above, EPA's modeling proceeds from arbitrary choices which depress the modeled impacts, while its variability and measurability metrics are arbitrarily elevated. These flaws compound each other, and when we address both sets of flaws at the same time, we observe that the impacts of U.S. vehicle GHGs on global temperature and sea level actually far exceed EPA's variability and measurability comparators, in some cases by more than an order of magnitude. As there are numerous permutations of such comparisons, we present only a sampling of potential comparisons to illustrate the severity of EPA's errors.

Beginning with temperature, as explained above, we report a temperature variability statistic of as low as 0.0193 °C, based on our calculations after addressing the various flaws implied in EPA's reported figure. We also report a measurement uncertainty of 0.02 °C based on the specific dataset contained in EPA's source, as well as other measurability statistics lower than the 0.05 °C cited by EPA, with the lowest at 0.011 °C. As already explained, EPA's reported 2100 temperature impact of 0.037 °C exceeds these metrics, so that even otherwise assuming EPA's methodology, such impacts are not *de minimis*. When we address the flaws in EPA's modeling, we report significantly higher temperature impacts, for example 0.115 °C in 2200 assuming EPA's emissions inputs (Scenario A) and 0.269 °C in 2200 had EPA never regulated vehicle GHGs (Scenario C). These figures far exceed the measurability and variability comparators. For example, in a scenario where EPA had never regulated vehicle GHGs, the temperature impacts by 2200 (0.269 °C, Scenario C) could be 24 times the size of the above-reported measurement uncertainty metric (0.011 °C) and be nearly 14 times the size of the above variability metric (0.0193°C).

The same story holds true for sea level rise changes. We report a measurement uncertainty of 0.4 cm based on a NASA dataset.[175] As already explained, EPA's reported 2100 sea level rise impact of 1.4 cm is already 3.5 times this amount. When we address the flaws in EPA's modeling, we report significantly higher sea level rise impacts, for example 6.39 cm in 2200 assuming EPA's emissions inputs (Scenario A) and 14.37 cm in 2200 had EPA never regulated vehicle GHGs (Scenario C). These figures grossly exceed the measurability uncertainty. For example, in a scenario where EPA had never regulated vehicle GHGs, the sea level rise impacts by 2200 (14.37 cm, Scenario C) could

[174] We detail our calculations for this scenario, as well as other scenarios, in Appendix C.
[175] As noted above, EPA does not calculate a variability statistic for sea level, so we also do not present a variability statistic here.

be nearly 36 times the size of the above measurement uncertainty metric (0.4 cm).

3. EPA's new measurability and variability tests cannot be reconciled with prior agency determinations that even smaller impacts are meaningful for Clean Air Act section 202(a) regulatory purposes.

EPA also neglects to explain why it is adopting these new comparative metrics for global temperature and sea level rise impacts at all, when earlier GHG rules explicitly found that small changes in global temperature and sea level rise—including changes over an order of magnitude smaller than the agency is now modeling—are in fact meaningful. This argument was made in public comments,[176] and given EPA's newfound focus on global temperature and sea level rise, we further elaborate the argument here.

For example, in the 2010 light-duty GHG rule, EPA's modeling of the rule's impacts showed that "global mean temperature is estimated to be reduced by 0.006 to 0.015 °C by 2100 . . . and sea-level rise is projected to be reduced by approximately 0.06-0.14cm by 2100."[177] EPA then addressed adverse comments "that the projected changes in climate impacts resulting from this action are small and therefore not meaningful," stating that the agency "disagrees with this view as the reductions may be small in overall magnitude, but in the global climate change context, they are quantifiable showing a clear directional signal across a range of climate sensitivities. EPA therefore determines that the projected reductions in atmospheric CO_2, global mean temperature and sea level rise are meaningful in the context of this rule."[178] EPA further explained that such changes were meaningful regardless of whether they were within the range of measurement sensitivity, and that measurability was not an appropriate criterion for evaluating the materiality of GHG emissions reductions.[179] Finally, EPA noted that its "rule takes many factors into consideration," and that apart from global temperature and sea level rise impacts, "[t]he benefits of GHG emissions reductions can be characterized both qualitatively and quantitatively, some of which can be monetized."[180] Later EPA vehicle GHG rules reprised similar modeling exercises and continued to find that even smaller impacts on global temperature and sea level rise lead to meaningful health and environmental effects.[181]

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[176] NGO Vehicles Comment at 110.
[177] 75 Fed. Reg. at 25495.
[178] *Id.*
[179] *See* EPA Response to Comments Document for Joint Rulemaking of Light-Duty Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards (2010), 5-389 to 5-390.
[180] *Id.* at 5-391.
[181] *See, e.g.*, 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards, 77 Fed. Reg. 62624, 62895-96 (Oct. 14, 2012) ("Although the projected reductions and improvements are small in comparison to the total projected climate change, they are quantifiable, directionally consistent, and will contribute to reducing the risks associated with climate change. Climate change is a global phenomenon and EPA recognizes that this one national action alone will not prevent it: EPA notes this would be true for any given GHG mitigation action when taken alone or when considered in isolation. *See Coalition for Responsible Regulation* v. *EPA* . . . noting that the GHG emission reductions of the MYs 2012-2016 rule 'result in meaningful mitigation of greenhouse gas emissions'; the projected emissions reductions of this MYs 2017-2025 rule are projected to be approximately double those of the MYs

The Final Rule's modeled changes in global temperature and sea level rise from U.S. vehicle emissions are far greater than those projected in earlier rules. For example, compared to the 2010 LD GHG rule, the Final Rule's modeled global temperature changes are roughly 2.5 to 6 times larger, and global sea level rise changes are 10 to 23 times larger. Despite this, EPA has not reconciled its prior finding that its GHG standards had meaningful impacts with its novel conclusion that the far greater impacts of all U.S. vehicle GHGs—and all standards in any conceivable circumstance—are now *de minimis,* nor has it even acknowledged this sudden about-face[182] EPA's failure to address the reasoning provided in the earlier rules renders its deviation from past practice procedurally unexplained and substantively wrong.[183]

B. EPA articulates a novel 1% test for *de minimis* impacts found nowhere in the proposal, and that test is both contrary to law and arbitrary and capricious.

In the Final Rule, EPA announces for the first time a 1% test for determining whether emission impacts are *de minimis* and therefore allegedly absolve EPA of its statutory duty to make an endangerment finding under Clean Air Act section 202(a)(1). EPA asserts that the impact of its 50%-reduced emissions scenario on trends in global temperature and sea level rise equals less than 1% of the projected changes through 2050 and 2100.[184] Based on this novel 1% test, EPA concludes, "these impacts are *de minimis* and . . . the futility of GHG emission standards under CAA section 202(a)(1) further supports the understanding that Congress did not design that provision to authorize or require the Administrator to prescribe standards in response to global climate change concerns."[185]

Petitioners had no opportunity to comment on the use of 1% as an appropriate or dispositive *de minimis* threshold for evaluating whether emission standards under Clean Air Act section 202 are futile. EPA's proposed rescission of the Endangerment Finding failed to mention even once, let alone propose, the use of such threshold. EPA's proposal faulted the Endangerment Finding for allegedly failing to "consider the extent to which emissions from CAA section 202(a) sources have a more than *de minimis* effect on the danger identified with respect to elevated

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2012-2016 rule so that this rule obviously results in 'meaningful mitigation of greenhouse gas emissions' as well."); Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles, 76 Fed. Reg. 57106, 57298-99 (Sept. 15, 2011)(similar); Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles, 81 Fed. Reg. 73478, 73835 (Oct. 25, 2016)(similar).

[182] *See FCC v. Fox TV Stations, Inc., 556 U.S. 502, 515 (2009)* ("The requirement that an agency provide reasoned explanation for its action would ordinarily demand that it display awareness that it *is* changing position. An agency may not, for example, depart from a prior policy *sub silentio* or simply disregard rules that are still on the books.").

[183] EPA's RTC specifically recognizes the lower impacts found in the 2010 Light-Duty GHG rule, but the agency fails to justify —and could not reasonably justify—why it now considers impacts that were previously found meaningful to no longer be meaningful. *See* RTC at 219.

[184] 91 Fed. Reg. at 7691.

[185] *Id.*

concentrations of GHGs in the upper atmosphere," as well as, "whether emissions from any particular class or classes of sources that EPA intended to regulate had such [a *de minimis*] effect."[186] While EPA's proposal invoked *de minimis* principles as a proposed basis to repeal the Endangerment Finding, nowhere does it state, or even suggest, that 1% constitutes a *de minimis* threshold that would determine whether regulation is futile. Instead, the proposal used the 2025 Climate Working Group Draft Report's analysis (which the Final Rule *expressly disclaims* reliance upon for any purpose) to suggest an approximately 3% reduction in predicted warming trends is a *de minimis* impact.[187] By contrast, the Final Rule purports to rely on judicial precedent to derive a completely different threshold for *de minimis* impacts. Therefore, it was clearly impracticable during the comment period on the proposal for Petitioners or any member of the public to raise any objections to the Final Rule's 1% de minimis threshold. For the reasons described below, EPA must convene a proceeding to reconsider its new de minimis threshold. EPA's selection of a 1% threshold to determine futility has no basis in judicial precedent and is arbitrary and capricious.

EPA's failure to provide an adequate notice of the 1% *de minimis* threshold deprives Petitioners and other members of the public of the opportunity to comment on EPA's arbitrary and capricious justification for this threshold. EPA misleadingly claims that "regulatory agencies and courts have consistently viewed impacts of 1% as *de minimis* and therefore not encompassed within general statutory language."[188] Contrary to EPA's claims, general principles of *de minimis* case law make clear that determining when something is "truly *de minimis* naturally will turn on the assessment of particular circumstances, and the agency will bear the burden of making the required showing."[189] Whether an amount is *de minimis* depends on whether the regulation will "yield a gain of trivial or no value,"[190] and "the Agency must follow a rational approach to determine what level of emission is a *de minimis* amount."[191] Yet EPA made no effort to "bear [its] burden" of showing that the Final Rule's 1% threshold weeds out "truly *de minimis*" emissions in the context of regulating mobile source GHGs.[192] The Final Rule's 1% threshold is also contrary to the principle that the *de minimis* doctrine "is not available to thwart a statutory command,"[193] "but rather [it is] a tool to be used in implementing the legislative design."[194] Commenters' critiques of the same flawed statutory interpretation of Clean Air Act section 202(a) advanced by EPA in the proposal apply with equal weight here.[195]

EPA cites to five cases in support of its novel proposition that regulatory agencies and courts have consistently viewed impacts of 1% as *de minimis*, misconstruing and misapplying each one in a futile attempt to justify its arbitrary threshold.[196] All five cases use different thresholds, and none identify a particular threshold that broadly applies as *de minimis* in all circumstances. Of the

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[186] 90 Fed. Reg. at 36304.
[187] 90 Fed. Reg. at 36311.
[188] 91 Fed. Reg. at 7733.
[189] *Alabama Power Co. v. Costle*, 636 F.2d 323, 360 (D.C. Cir. 1979).
[190] *Id.* at 361.
[191] *Id.* at 405.
[192] *Id.* at 360.
[193] *Pub. Citizen v. Young*, 831 F.2d 1108, 1113 (D.C. Cir. 1987).
[194] *Alabama Power Co.*, 636 F.2d at 360.
[195] *See* NGO EF Comment at 85-89.
[196] 91 Fed. Reg. at 7686 n.185.

cited cases, *EPA v. EME Homer City Generation, L.P.*, 572 U.S. 489 (2014), is the only case in which an agency utilized a 1% *de minimis* threshold. Yet this case and underlying rule involved a different statutory provision and different record, and it provides no support for EPA's assertion that the courts have "consistently viewed" such a threshold as *de minimis*. Clean Air Act section 110(a)(2)(D)(i), the provision at issue in *EME Homer*, conditions state implementation plan obligations on whether upwind air pollution "contribute[s] significantly to nonattainment" in downwind states. The interstate air pollution Transport Rule at issue in *EME Homer* used 1% of the relevant National Ambient Air Quality Standards (NAAQS) to screen out upwind contributions below that threshold for purposes of further regulation, but it did not use that threshold alone to determine which amounts of air pollution do or do not constitute "amounts which will . . . contribute significantly."[197] The Final Rule's suggestion that the 1% threshold used in that context supports the use of a 1% threshold in deciding whether regulation under Clean Air Act section 202(a) is futile misrepresents *EME Homer*; the Court never so much as hints that the 1% threshold at issue there is appropriate in any other context.

Additionally, EPA's arbitrary and capricious reliance on the 1% threshold in the Transport Rule as justification for a *de minimis* threshold in the Final Rule ignores both the purpose of that threshold in the context of Clean Air Act section 110(a)(2)(D)(i) and EPA's robust analytical work to justify that threshold within that different context. The Transport Rule used the 1% threshold to regulate a large (albeit not complete) set of contributors that create most of the downwind nonattainment problem. By contrast, EPA in the Final Rule uses the 1% threshold to disclaim *any responsibility at all* to implement the statutory command under Clean Air Act section 202(a)(1) to regulate mobile source GHGs that endanger public health and welfare. Additionally, EPA provides no technical justification whatsoever for the use of such threshold in the Final Rule, whereas the Transport Rule, in seeking to identify a rational solution to the downwind pollution problem exacerbated by collective upwind pollution, contained significant technical analyses of several potential thresholds in order to justify the use of 1%.[198] The Transport Rule's use of 1% was thus a carefully selected screening threshold in order to efficiently resolve most of the downwind pollution problem; it was not a *de minimis* threshold used to justify defying the Clean Air Act's legislative design, nor was it ever intended to apply across other Clean Air Act programs that tackle entirely different problems.

EPA's use of the 1% *de minimis* threshold to determine the futility of regulating GHGs from new motor vehicles and engines under Clean Air Act section 202 is of central relevance to the Final Rule. EPA states that its futility rationale is a sufficient independent basis to support its rescission of the Endangerment Finding. EPA argues that "CAA section 202(a)(1) requires that emission standards be capable of having a material impact on the identified danger for the Administrator to conclude that the emissions 'contribute' to air pollution that may 'reasonably be anticipated' to endanger public health and welfare."[199] EPA's finding that vehicle GHG emissions standards are futile is based on its analysis of whether new vehicle and engine standards for GHGs have less than 1% impact on modeled global temperature and sea level rise. The 1% threshold is thus centrally relevant to the Final Rule, as it is a dispositive basis for EPA's futility finding and its consequent

[197] *EME Homer*, 572 U.S. at 495.
[198] Federal Implementation Plans: Interstate Transport of Fine Particulate Matter and Ozone and Correction of SIP Approvals, 76 Fed. Reg. 48208, 48237 (Aug. 8, 2011).
[199] 91 Fed. Reg. at 7733.

repeal of the Endangerment Finding and associated GHG standards.

Because it was impracticable to raise objections to the 1% threshold at the time of proposal, and the 1% threshold is of central relevance to EPA's rescission of the Endangerment Finding and related emission standards, EPA is required to grant reconsideration on this issue.

VI. EPA TAKES A NEW POSITION THAT IT CANNOT MONETIZE CRITERIA POLLUTANT HEALTH BENEFITS ASSOCIATED WITH THE VEHICLE GHG STANDARDS.

Commenters provided extensive comments on EPA's flawed analysis of the proposal's emissions and health impacts from criteria pollutants.[200] However, EPA claims for the first time in the Final Rule that due to analytical uncertainties, it cannot monetize health benefits resulting from ozone and particulate matter pollution reductions achieved by the vehicle GHG standards.[201] Essentially zeroing out certain health benefits associated with the standards—benefits that EPA accounted for when initially adopting the standards, on the basis of purported uncertainties—is unreasonable and contrary to EPA's own prior determinations. By generically stating that costs are immense while casting aside any quantification, or even qualification, of health benefits, EPA has produced an egregiously skewed analysis to support repealing the GHG emission standards that precludes fair comparison of regulatory alternatives.[202]

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.[203] Here, EPA's stated justification for declining to report and consider hundreds of millions of dollars, if not billions of dollars, in potential quantified health benefits—set forth in a brief explanation in the Final Rule with no notice of EPA's novel position in the proposal—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, it 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

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[200] *See, e.g.*, State Attorney Generals and Chief Legal Officers, Comments on the Proposed Reconsideration of 2009 Endangerment Finding and Greenhouse Gas Vehicle Standards, Docket No. EPA-HQ-OAR-2025-0194-2947, at 81-89.
[201] 91 Fed. Reg. at 7757.
[202] *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").
[203] *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 515-16 (2009).

are justified (even though to this day EPA commits to adhering to those guidelines on its website).[204] 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 its Science Advisory Board. Nor does EPA explain why it is violating the requirement in Executive Order 12,866, which compels 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," 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.[205] 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 announcing its sudden refusal to quantify health benefits. Indeed, EPA in the Final Rule does not even acknowledge that it has in place extraordinarily detailed and rigorously peer-reviewed economic analysis guidelines.

An opportunity to raise objections to EPA's devaluing of criteria pollutant health benefits based on supposed analytical uncertainties would allow Petitioners and the public to demonstrate the arbitrary and capricious nature of this aspect of the Final Rule. 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 false precision and confidence regarding the monetized impacts of fine particulate matter ($PM_{2.5}$) and ozone than the underlying science could fully support."[206] But that explanation does not disclaim that health benefits actually exist, nor does it acknowledge that its wholesale failure to quantify those benefits instills the much *greater* false sense that the benefits are in fact negligible, as EPA now effectively treats them. Nor does EPA's conclusory statement acknowledge or grapple with the strong scientific underpinnings for the Agency's longstanding approach to assess health impacts associated with ozone and particulate matter in its previous rulemakings—including the suite of Integrated Scientific Assessments and Technical Support Documents documenting EPA's analytical methods and characterizing sources of uncertainty; the Scientific Advisory Board and Clean Air Scientific Advisory Committee 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.[207] The Final Rule

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[204] *See* EPA, Guidelines For Preparing Economic Analyses, 3rd Edition, https://www.epa.gov/environmental-economics/guidelines-preparing-economic-analyses-3rd-edition (last visited April 15, 2026) ("The EPA will use the *Guidelines* to evaluate the economic consequences of its regulations and policies").

[205] *Id.*

[206] 91 Fed. Reg. at 7757.

[207] *See, e.g.,* 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; EPA, *Estimating PM2.5- and Ozone-Attributable Health*

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.[208]

The novel and sudden decision to not quantify health benefits at all on the basis of supposed analytical uncertainties is of central relevance to the Final Rule, because it is fundamental to EPA's new conclusion that retaining the standards is unreasonable.[209] Accordingly, mandatory reconsideration is required on EPA's decision to not monetize health benefits resulting from ozone and particulate matter pollution reductions associated with retaining the vehicle GHG standards.

VII. CONCLUSION

For the foregoing reasons, Petitioners respectfully request that the Administrator convene a proceeding for reconsideration of the specified aspects of the Final Rule pursuant to Clean Air Act section 307(d)(7)(B).

Benefits: 2024 Update 103 (June 2024), https://www.epa.gov/system/files/documents/2024-06/estimating-pm2.5-and-ozone-attributable-health-benefits-tsd-2024.pdf; EPA, *Technical Support Document: Estimating the Benefit per Ton of Reducing Directly-Emitted PM2.5, PM2.5 Precursors and Ozone Precursors from 21 Sector*s at Att. 105, p. 6 (June 2024) (Docket No. EPA-HQ-OAR-2024-0419-0013); Supplement to the 2019 Integrated Science Assessment for Particulate Matter, 87 Fed. Reg. 22207 (Apr. 14, 2022); 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* (Mar. 18, 2022), https://www.4cleanair.org/wp-content/uploads/PM-NAAQS-CASAC-Responses-to-EPA-PM-Draft-PA-031822.pdf; EPA, *Policy Assessment for the Review of the National Ambient Air Quality Standards for Particulate Matter* (2021), https://www.epa.gov/system/files/documents/2021-10/final-policy-assessment-for-the-review-of-the-pm-naaqs-01-2020.pdf.

[208] *See Ctr. for Biological Diversity v. NHTSA*, 508 F.3d 508, 534 (9th Cir. 2007) (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").

[209] 91 Fed. Reg. at 7734.

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VIII. TRANSMISSION AND ATTACHMENTS

A copy of the foregoing Petition for Reconsideration and accompanying appendices is being sent on April 15, 2026, by email, and on April 16, 2026, by mail, to the following:

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A copy is also being sent on April 15, 2026, by email, to Aaron Szabo, U.S. EPA Assistant Administrator for the Office of Air and Radiation, at szabo.aaron@epa.gov.

Below is a list of accompanying appendices:

- Appendix A: Technical Memorandum on Modeling
- Appendix B: Technical Memorandum on the EPA Final Rule's Reliance on Global Average Temperature and Sea Level Rise Metrics
- Appendix C: Technical Memorandum on EPA's Final Rule Analysis of Variability and

Measurability

- Appendix D: Modeling the Sea-Level Change from U.S. Vehicle Emissions

In addition, we are submitting via email a link to access certain documents cited in this Petition, including the below:

- Michael Ablain et al., *Uncertainty in satellite estimates of global mean sea-level changes, trend and acceleration*. 11 Earth Sys. Science Data 1189 (2019), https://essd.copernicus.org/articles/11/1189/2019/.
- T.J. Ballinger et al., NOAA, *Arctic Report Card 2025: Surface Air Temperature* (Nov. 18, 2025), https://arctic.noaa.gov/report-card/report-card-2025/surface-air-temperature-2025/
- Josh Blumenfeld, *The Precision Behind Sea Level Rise,* NASA EarthData (last updated Jan. 16, 2025), https://www.earthdata.nasa.gov/news/feature-articles/precision-behind-sea-level-rise.
- John D. Boon et al., *Anthropocene Sea Level Change: A History of Recent Trends Observed in the U.S. East, Gulf, and West Coast Regions*, Va. Inst. of Marine Sci., Applied Marine Sci. and Ocean Eng'g, Spec. Rep. No. 467, at IV-2 (2018), https://scholarworks.wm.edu/entities/publication/fc099785-8ecc-47ec-9818-835ea9c8f19e.
- M.L. Druckenmiller et al., NOAA, *Arctic Report Card 2025: Executive Summary* (Dec. 23, 2025), https://doi.org/10.25923/NRZF-J897.
- Environmental Law & Policy Center, *An Assessment of the Impacts of Climate Change on the Great Lakes* (2019), https://elpc.org/wp-content/uploads/2020/04/2019-ELPCPublication-Great-Lakes-Climate-Change-Report.pdf
- Veronika Eyring et al., *Human Influence on the Climate System*, *in* Climate Change 2021: The Physical Science Basis, Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (Valérie Masson-Delmotte et al. eds., 2021), https://www.ipcc.ch/report/ar6/wg1/chapter/chapter-3/.
- Thomas Frederikse et al., *The causes of sea-level rise since 1900*. 584 Nature 393 (2020) https://doi.org/10.1038/s41586-020-2591-3.
- Boyin Huang et al., *Uncertainty Estimates for Sea Surface Temperature and Land Surface Air Temperature in NOAAGlobalTemp Version 5*, 33 Journal of Climate 1351 (2020), https://doi.org/10.1175/JCLI-D-19-0395.1.
- Nathan J.L. Lenssen et al., *Improvements in the GISTEMP uncertainty model.* 124 J. of Geophysical Rsch.: Atmospheres 6307 (2019), https://doi.org/10.1029/2018JD029522.
- Nathan J.L. Lenssen et al., *A NASA GISTEMPv4 observational uncertainty ensemble*, 129 J. of Geophysical Rsch.: Atmospheres 1 (2024), https://doi.org/10.1029/2023JD040179.
- Kate Marvel et al., *Chapter 2: Climate Trends*, *in* Fifth National Climate Assessment (Allison R. Crimmins et al., eds., 2023), 2-4, https://toolkit.climate.gov/sites/default/files/2025-07/NCA5_Ch2_Climate-Trends.pdf.
- C.P. Morice et al., *An updated assessment of near-surface temperature change from 1850: the HadCRUT5 data set*, 126 J. of Geophysical Rsch.: Atmospheres 1 (Feb. 2021), https://doi.org/10.1029/2019JD032361.
- NASA, *Major Greenhouse Gas Sources, Lifespans, and Possible Added Heat* (June 22, 2023). https://science.nasa.gov/resource/graphic-major-greenhouse-gas-sources-lifespans-and-

possible-added-heat/

- NASA, *Global Mean Sea Level*, https://sealevel.nasa.gov/understanding-sea-level/key-indicators/global-mean-sea-level/ (last visited Apr. 14, 2026).
- NOAA, National Centers for Environmental Information, *Accounting for Natural Variability in Our Changing Climate* (Aug. 5, 2019), https://www.ncei.noaa.gov/news/accounting-natural-variability-our-changing-climate
- NOAA, National Centers for Environmental Information, *Climate at a Glance: Global Time Series,* https://www.ncei.noaa.gov/access/monitoring/climate-at-a-glance/global/time-series/globe/land_ocean/tavg/ytd/12/1950-2025 (last visited Apr. 15, 2026).
- Robert Rohde & Zeke Hausfather, *The Berkeley Earth Land/Ocean Temperature Record*, 12 Earth Syst. Sci. Data 3469 (2020) https://essd.copernicus.org/articles/12/3469/2020/.
- Robert Rohde, *Global Temperature Report for 2025*, Berkeley Earth (Jan. 14, 2026), https://berkeleyearth.org/global-temperature-report-for-2025/.
- William V. Sweet et al., NOAA, *Global and regional sea level rise scenarios for the United States: Technical Report NOS.01* 7 (Feb. 2022), https://earth.gov/sealevel/us/resources/2022-sea-level-rise-technical-report/.
- Sean Vitousek et al., *Doubling of coastal flooding frequency within decades due to sea-level rise*, 7 Sci. Rep. 1399 (2017), https://doi.org/10.1038/s41598-017-01362-7

The same link also contains additional documents supporting the Petition and the accompanying appendices, including:

- Modeling files and other documents relating to vehicle emissions inputs and FaIR modeling, supporting Appendix A.
- Analysis, datasets, and publications, supporting Appendix C.
- Modeling files and other documents related to BRICK modeling, supporting Appendix D.