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Re: Comments on Proposed Revision of Tier 4 Criteria Pollutant Standards, Part 1: Amendment to Phase-In Schedule for Light-Duty and Medium-Duty Vehicles, 91 Fed. Reg. 28,463 (May 18, 2026), Docket No. EPA-HQ-OAR-2025-3297

Environmental Defense Fund, Natural Resources Defense Council, Center for Biological Diversity, Environmental Law and Policy Center, and Sierra Club submit these comments to identify the many legal and technical errors in the U.S. Environmental Protection Agency's (EPA or "the Agency") proposed action titled *Revision of Tier 4 Criteria Pollutant Standards, Part 1: Amendment to Phase-In Schedule for Light-Duty and Medium-Duty Vehicles,* 91 Fed. Reg. 28,463 (May 18, 2026) ("Proposal"). As detailed below, the Proposal unlawfully abdicates EPA's statutory duty to protect public health and the environment from dangerous vehicle emissions. The Proposal is also based on inadequately explained, unsupported, and unreasonable factual findings and conclusions that render it arbitrary and capricious. Furthermore, the Proposal process fails to comply with the procedural requirements of the Clean Air Act and multiple executive orders.

Although EPA describes its Proposal as a temporary "delay" in implementation of the critical, life-saving criteria pollutant emissions standards for light- and medium-duty vehicles that EPA finalized just two years ago, *see* 89 Fed. Reg. 27,842 (April 18, 2024) ("2024 Rule"), EPA is in fact proposing to *eliminate* those standards for Model Year (MY) 2027-2028 vehicles and replace them with outdated requirements from more than a decade ago that fail to protect public health and reflect modern technology as the Clean Air Act requires. This rollback would result in tens of thousands of tons of additional dangerous pollution as well as premature deaths and other health harms in communities across the country, and is patently unreasonable and unlawful.

As explained in these comments, EPA's proposed rollback of MY 2027-28 standards is illegal. EPA lacks statutory authority to backslide on pollution control or to retroactively alter these standards. The Proposal also violates other Clean Air Act requirements, including Congress's mandate that standards for certain covered vehicles reflect the greatest emissions reduction achievable, and its prohibition of actions that interfere with state efforts to comply with national standards for healthy air.

Even if EPA had statutory authority for the Proposal, which it does not, the Proposal is unsupported, unsupportable, inadequately explained, and riddled with errors. EPA fails to rationally balance the statutory factors it must consider when setting new standards—including

reducing dangerous emissions, technological feasibility, lead time, and costs—and unlawfully fails to prioritize the central statutory objective of protecting public health. EPA unreasonably proposes to increase pollution, underestimates the pollution increases that the Proposal will cause, and fails to consider or monetize the health impacts associated with that pollution. EPA further fails to explain its abrupt about-face from the standards it finalized in 2024, which are supported by a robust record and detailed analysis. Indeed, as discussed further below, EPA's own publicly accessible vehicle certification data show that 68.3% of MY 2026 light-duty models from the top ten manufacturers (excluding Tesla) certified at or below the current MY 2027 standard for non-methane organic gasses and nitrogen oxides. In addition, EPA fails to consider a range of reasonable alternatives that would be less damaging to public health and significant reliance interests.

EPA's slapdash rulemaking process also fails to comply with applicable procedural requirements and multiple executive orders. Most notably, EPA violated the Clean Air Act's docketing requirements by failing to provide the public with essential data underlying the Proposal, even though data contrary to some of its key allegations are undoubtedly in its possession. And EPA has otherwise denied stakeholders an adequate and meaningful opportunity to engage in this consequential rulemaking process, as well as the consultation and analysis guaranteed by executive order.

In light of the myriad legal, factual, and procedural errors of the Proposal detailed below, as well as the enormous health harms and costs that this Proposal would cause, EPA should abandon this illegal and misguided Proposal and instead fully implement and enforce its existing criteria-pollutant emissions standards for light- and medium-duty passenger vehicles.

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BACKGROUND

A. The Tier 4 Criteria Pollution Standards Are Critically Important to Protect Public Health.

In April 2024, EPA finalized new "Tier 4 Standards"—multi-pollutant emissions standards for light- and medium-duty passenger vehicles—which phase in from MYs 2027 to 2032. 89 Fed. Reg. 27,842 (April 18, 2024). The 2024 Rule established technology-neutral standards for non-methane organic gases (NMOG), nitrogen oxides (NOx), and fine particulate matter (PM2.5). EPA estimated that the Tier 4 Standards will reduce 36,000 tons of NOx emissions, 8,700 tons of particulate matter (PM) emissions, and 150,000 tons of volatile organic compound (VOC) emissions annually by 2055, providing $13 billion in annual health benefits. 89 Fed. Reg. at 27,858 tbl.5 & 28,092. As EPA noted upon finalizing the 2024 Rule, "the standards will provide important health benefits to millions of people across the country, including both urban and rural communities near major roadways, which are disproportionately exposed to air pollution from motor vehicles."[1]

For light-duty vehicles, EPA finalized combined standards for NMOG and NOx emissions (known as "NMOG+NOx standards") that phase down to a fleet average level of 15 milligrams per mile (mg/mi) by MY 2032—a 50% reduction from the prior "Tier 3" standard of 30 mg/mi standards for MY 2025. 89 Fed. Reg. at 27,857. EPA also finalized NMOG+NOx standards for medium-duty vehicles that require a fleet average level of 75 mg/mi by MY 2033—a 58-70% reduction from the prior standards of 178 mg/mi (for Class 2b vehicles) and 247 mg/mi (for Class 3 vehicles). *Id.*

For both light-duty and medium-duty vehicles, EPA finalized a PM standard of 0.5 mg/mi and a requirement that the standard be met across three test cycles, including a cold temperature test. *Id.* The PM standard will be fully phased in by MY 2030 for light-duty vehicles and by MY 2031 for medium-duty vehicles. *Id.* EPA projected the PM standard will reduce tailpipe PM emissions from gasoline vehicles by over 95%. Both sets of standards are also expected to reduce emissions of mobile source air toxics. *Id.*

The health benefits resulting from the Tier 4 Standards outweigh any costs of compliance. *Id.* at 27,859. Less illness translates to lower healthcare costs, greater worker productivity, and stronger local economies. The Proposal's emissions reductions would also be difficult to replicate from any other sector or source and are important for States working to meet National Ambient Air Quality Standards (NAAQS). *Id*. at 27,865

B. The Transportation Sector Is One of the Nation's Biggest Sources of Harmful Air Pollution.

Strong federal vehicle emissions standards are essential because highway vehicles—such as cars, trucks, sport utility vehicles, buses, dump trucks, and semis—remain top contributors to

[1] EPA, *Regulatory Announcement, Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles: Final Rule* 1 (Mar. 2024), https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P1019VP5.pdf.

our nation's air pollution. According to EPA, mobile sources are responsible for more than 55% of the nation's NOx emissions and a significant portion of particulate and VOC pollution.[2] In the United States, mobile sources are estimated to be the largest source of air-pollution-related premature mortalities, responsible for up to 53,000 PM2.5-attributable premature mortalities and 5,000 ozone-attributable premature mortalities each year.[3]

People who live, work, recreate, or attend school near major roads have an increased incidence and severity of health problems associated with exposure to vehicle emissions.[4] Children, older adults, people with preexisting heart and lung disease, and people of low socioeconomic status are at a higher risk for health impacts from air pollution near roadways. Every year, thousands of Americans suffer from more asthma attacks, cardiovascular disease and early deaths as a result of the harmful pollutants emitted by these vehicles, especially along trucking routes and near vehicle congestion points. Meaningful emissions standards for highway vehicles are a critical tool in reducing these harmful pollutants.

A 2021 study estimated the air quality and health impacts of on-road emissions from five vehicle classes, including light-duty cars and light-duty trucks, across parts of the United States and found that light-duty trucks are responsible for the most PM2.5 and ozone-attributable premature mortalities, with 46% of those mortalities from directly emitted primary PM and 80% of those mortalities from NOx emissions.[5]

The Tier 4 Standards are critical as they will prevent thousands of tons of harmful PM and NMOG+NOx pollution from being emitted into the air, resulting in tens of thousands of lives saved over the implementation of the standards.

1. Vehicle Emissions of PM Harm Human Health

Particulate pollution is a mix of directly emitted particles (e.g., from the tailpipes of gasoline and diesel vehicles, and by tire wear, brake wear, and road dust) and secondary particles formed in the atmosphere from other pollutants like sulfur dioxide, NOx, and VOCs that are also directly emitted from vehicles.[6] Exposure to such particles can impact the lungs and the heart.

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[2] *See* EPA, *Smog, Soot and Other Air Pollution from Transportation* (2021), https://19january2021snapshot.epa.gov/transportation-air-pollution-and-climate-change/smog-soot-and-local-air-pollution_.html.

[3] Fabio Caiazzo et al., *Air pollution and early deaths in the United States. Part I: quantifying the impact of major sectors in 2005*, 79 Atmos. Env't 198-208 (2013), https://static1.squarespace.com/static/56a45d683b0be33df885def6/t/5900a75e8419c2caf4891c9f/1493215074841/barrett_et_al_quantifying_impact_air_pollution_early_death_2013.pdf.

[4] *Id*.

[5] Calvin A. Arter et al., *Mortality-based damages per ton due to the on-road mobile sector in the Northeastern and Mid-Atlantic U.S. by region, vehicle class and precursor*, 16 Env't Res. Lett. (2021), https://iopscience.iop.org/article/10.1088/1748-9326/abf60b.

[6] *See* EPA, *Health and Environmental Effects of Particulate Matter (PM)*, https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm.

Fine particulates are especially dangerous because they can easily be inhaled deep into the lungs and some even get into the bloodstream.[7]

According to the American Lung Association, more than 62 million Americans in 120 counties across 23 States live in an area with unhealthy spikes in particle pollution.[8] More than 76 million people suffer from unhealthy year-round levels of particle pollution. Research has shown that the groups at the greatest risk from particle pollution include pregnant people and fetuses; infants, children, and older people; and people with pre-existing health harms like lung disease, chronic obstructive pulmonary disease, and cardiovascular disease.[9]

There is consistent evidence of a relationship between short-term exposure to PM and mortality, particularly cardiovascular and respiratory mortality.[10] Short- and long-term exposure to PM2.5 can cause harmful health impacts such as heart attacks, strokes, and worsened asthma, as well as early death.[11] In addition, short-term PM exposure has been linked to increases in: infant mortality, hospital admissions for cardiovascular disease, hospital admissions and emergency visits for chronic obstructive pulmonary disease, and severity of asthma attacks and hospitalization for asthma in children.[12] Year-round exposure to PM is associated with elevated risks of early death, primarily from cardiovascular and respiratory problems such as heart disease, stroke, influenza, and pneumonia.[13]

A 2012 peer-reviewed study reaffirmed the association of particulate pollution exposure with increased risk of premature mortality and also found that a decrease in PM pollution is associated with an increase in health benefits.[14] The study found that every 10 $\mu g/m^3$ increase in PM2.5 pollution was associated with a 14% increased risk of "all-cause" mortality, a 26% increase in cardiovascular death, and a 37% increase in lung cancer death. The study also found that a decrease of 1 $\mu g/m^3$ in population-average PM2.5 would result in approximately 34,000 fewer deaths per year.

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[7] *Id.*

[8] Am. Lung Ass'n, *State of the Air* 16 (2026), https://www.lung.org/research/sota.

[9] *Id*. at 32.

[10] *See* EPA, *Supplement to the 2019 Integrated Science Assessment for Particulate Matter* at ES-ii, 2-3, 2-4 (2022), https://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=354490; EPA, Integrated Science Assessment (ISA) for Particulate Matter (Dec. 2019), https://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=347534.

[11] *Id*.

[12] *Id*.; Bing Zhao et al., *Short-term exposure to ambient fine particulate matter and out-of-hospital cardiac arrest: a nationwide case-crossover study in Japan*, 4 Lancet E15 (2020), https://pubmed.ncbi.nlm.nih.gov/31999950/

[13] Johanna Lepeule et al., *Chronic Exposure to Fine Particles and Mortality: An Extended Follow-up of the Harvard Six Cities Study from1974 to 2009*, 120 Env't Health Persp. 965 (2012), https://pmc.ncbi.nlm.nih.gov/articles/PMC3404667/; *see also generally* Am. Lung Ass'n, *supra*.

[14] Lepeule et al. (2012), *supra*.

2. Vehicle Emissions of NMOG+NOx Harm Human Health

Vehicle emissions of NOx and NMOG (including VOCs) contribute significantly to our nation's harmful air pollution. NOx and VOC emissions are precursors to PM pollution, as already explained. They are also precursors to ozone formation, and there is a broad scientific consensus that exposure to ozone is associated with serious public health impacts.[15] Ozone (also known as smog) forms when VOCs and NOx react in the presence of heat and sunlight. The process becomes more pronounced in the late afternoons and summertime, and rising temperatures due to climate change exacerbate the problem.[16]

According to the American Lung Association, ground-level ozone pollution is harming more people living in the United States than any other single pollutant. There are more than 129 million Americans—nearly 40% of the population—living in 219 counties across 36 States and the District of Columbia breathing unhealthy levels of ozone pollution.[17] After several years of successful reductions in ozone pollution in many parts of the country—thanks primarily to clean-up measures enacted under the Clean Air Act—emissions trends showed a distressing reversal in 2025 and 2026.[18]

A longstanding body of scientific research, including numerous EPA assessments, demonstrates that exposure to ground-level ozone harms human health and can cause heart disease, permanent lung damage, aggravation of asthma, and premature death from respiratory causes.[19] In its 2020 Integrated Scientific Assessment for Ozone, EPA concluded that short-term ozone exposure causes respiratory effects, including decreases in lung function, asthma and chronic obstructive pulmonary disease exacerbations, and increases in respiratory-related hospital admissions and emergency room visits.[20] Short-term ozone exposure has also been

[15] *See* EPA, *Health Effects of Ozone in the General Population*, https://www.epa.gov/ozone-pollution-and-your-patients-health/health-effects-ozone-general-population.

[16] *See, e.g.*, Am. Lung Ass'n, *supra*, at 15; EPA, *Basic Information about NO2*, https://www.epa.gov/no2-pollution/basic-information-about-no2.

[17] Am. Lung Ass'n, *supra*, at 14.

[18] *Id.*

[19] *See* EPA, *Health Effects of Ozone in the General Population*, https://www.epa.gov/ozone-pollution-and-your-patients-health/health-effects-ozone-general-population.

[20] EPA, *Integrated Science Assessment for Ozone and Related Photochemical Oxidants* at IS-1, EPA/600/R-20/012 (Apr. 2020), https://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=348522 ("EPA Ozone ISA").

linked to cardiovascular effects including cardiac arrest,[21] stroke,[22] and arrhythmias,[23] as well as premature mortality.[24]

Long-term exposure to ozone also has significant health implications. It has been linked to respiratory effects, new-onset asthma, development and diagnosis of metabolic syndromes, increased incidence of type 2 diabetes, and diabetes-related mortality.[25]

Ozone pollution is especially harmful to vulnerable populations, including children, people with respiratory diseases or asthma, older adults, and people who work or recreate outdoors.[26] Children with asthma experience reductions in lung function and increases in respiratory symptoms when exposed to ozone pollution.[27] The Asthma and Allergy Foundation estimates that 23 million U.S. adults (nearly 1 in 10) and 5 million U.S. children had asthma in 2024.[28] Asthma is a top chronic disease among U.S. children, and black children are nearly two times more likely to have asthma than white children.[29] And on average, 9 to 11 people in the United States die from asthma each day.[30]

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[21] Zhiqiang Zong et al., *Association between Snort-Term Exposure to Ozone and Heart Rate Variability: A Systematic Review and Meta-Analysis*, 19 Int'l J. Env't Res. & Pub. Health 11186 (2022), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9517606/; Katherine B. Ensor et al., *A Case-Crossover Analysis of Out-of-Hospital Cardiac Arrest and Air Pollution*, 127 Circulation 1192 (2013), https://www.ncbi.nlm.nih.gov/pubmed/23406673.

[22] Wan-Shui Yang et a1., *An evidence-based appraisal of global association between air pollution and risk of stroke*, 175 Int'l J. Cardiology 307 (2014), https://www.sciencedirect.com/science/article/abs/pii/S0167527314010274

[23] Qingmiao Shao et al., *Association between air pollution and development of atrial fibrillation: A meta-analysis of observational studies*, 45 Heart & Lung 557 (2016), https://pubmed.ncbi.nlm.nih.gov/27590407/.

[24] Sanghyuk Bae et al., *Non-Linear Concentration-Response Relationships between Ambient Ozone and Daily Mortality*, 10 PLoS ONE 1 (2015). https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0129423; Philippe Collart et al., *Concentration response curve and cumulative effects between ozone and daily mortality: an analysis in Wallonia, Belgium*, 28 Int'l J. Env't Health Res. 147 (2018), https://www.tandfonline.com/doi/abs/10.1080/09603123.2018.1453050?__cf_chl_f_tk=04Ihcn67bVy8RSKu_yyGxkd01gU1dPD.XcozI8UAUSg-1782763715-1.0.1.1-3gw73NtpSaGDSFwfA1iDe76Y9x8iJZJyxPNGFWUdTm0.

[25] EPA Ozone ISA at IS-8.

[26] *See* EPA, *Health Effects of Ozone in the General Population,* https://www.epa.gov/ozone-pollution-and-your-patients-health/health-effects-ozone-general-population.

[27] *See, e.g.*, EPA Ozone ISA at 6-120, 6-160; Jaime E. Mirowsky, Lisa A. Dailey, & Robert B. Devlin, *Differential expression of pro-inflammatory and oxidative stress mediators induced by nitrogen dioxide and ozone in primary human bronchial epithelial cells*, 28 Inhalation Toxicology 374 (2016), https://pubmed.ncbi.nlm.nih.gov/27206323/.

[28] Asthma & Allergy Foundation of Am., *Asthma Facts and Figures* (2025), https://aafa.org/wp-content/uploads/2025/04/aafa-asthma-facts-and-figures.pdf.

[29] *Id*.

[30] *Id*.

LEGAL STANDARD

The Clean Air Act prohibits EPA from finalizing rules that are "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law," "in excess of statutory jurisdiction, authority, or limitations, or short of statutory right," or "without observance of procedure required by law." 42 U.S.C. § 7607(d)(9).

To be lawful, an agency action must be "reasonable and reasonably explained." *FCC v. Prometheus Radio Project*, 592 U.S. 414, 423 (2021); *see also FDA v. Wages & White Lion Invs., L.L.C.*, 604 U.S. 542, 567-69 (2025) (citing *Encino Motorcars, L.L.C. v. Navarro*, 579 U.S. 211, 221-22 (2016); *FCC v. Fox Television Stations, Inc.*, 556 U.S. 502, 515 (2009); *Motor Vehicle Mfrs. Ass'n of United States, Inc. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983)). Specifically, the agency must "articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.'" *State Farm*, 463 U.S. at 43 (quoting *Burlington Truck Lines, Inc. v. United States*, 371 U.S. 156, 168 (1962)). The agency cannot "rel[y] on factors which Congress has not intended it to consider" or "entirely fail[ ] to consider an important aspect of the problem." *Id.* Nor can it "offer[ ] an explanation for its decision that runs counter to the evidence before the agency." *Id.* The agency's decision must be "justified by the rulemaking record." *Id.* Further, "its reasoned analysis must consider the 'alternative[s]' that are 'within the ambit of the existing [policy].'" *Dep't of Homeland Sec. v. Regents of the Univ. of Cal.*, 591 U.S. 1, 30 (2020) (quoting *State Farm*, 463 U.S. at 51). To the extent the agency uses a cost-benefit analysis, such analysis must be reasonable. *See Window Covering Mfrs. Ass'n v. Consumer Prod. Safety Comm'n*, 82 F.4th 1273, 1288 (D.C. Cir. 2023) ("'an unreasonable assessment of social costs and benefits' can render a rule arbitrary and capricious" (citing *Thompson v. Clark*, 741 F.2d 401 (D.C. Cir. 1984)).

When departing from prior positions, an agency must provide "a reasoned explanation ... for disregarding facts and circumstances that underlay or were engendered by the prior policy." *Fox Television*, 556 U.S. at 515-16. Accordingly, if an agency's "new policy rests upon factual findings that contradict those which underlay its prior policy," or when the prior policy has engendered serious reliance interests, the agency must provide a "more detailed justification than what would suffice for a new policy created on a blank slate." *Id.*; *Wages & White Lion*, 604 U.S. at 568; *Regents*, 591 U.S. at 22. An "'[u]nexplained inconsistency' in agency policy is 'a reason for holding an interpretation to be an arbitrary and capricious change from agency practice.'" *Encino Motorcars*, 579 U.S. at 222 (quoting *Nat'l Cable & Telecomms. Ass'n v. Brand X Internet Servs.*, 545 U.S. 967, 981 (2005)). And an agency's failure to adequately consider reliance interests, "independent of the [action's] substantive validity," may "warrant[ ] vacatur and remand." *Capital Power Corp. v. FERC*, 156 F.4th 644, 650 (D.C. Cir. 2025).

A court reviewing an agency action "must exercise independent judgment in determining the meaning of statutory provisions." *Loper Bright Enters. v. Raimondo*, 603 U.S. 369, 394 (2024).

DETAILED COMMENTS

I. The Proposal Exceeds EPA's Statutory Authority.

Although EPA describes its Proposal as a mere "delay" of the 2024 Rule phase-in schedule, the Agency is in fact proposing to eliminate the life-saving Tier 4 Standards for MYs 2027-28 and replace them with the weaker Tier 3 Standards, *see* 79 Fed. Reg. 23,414 (Apr. 28, 2014), which relied on findings of technological feasibility and cost that are now more than twelve years old. If finalized, this proposed rollback will result in emissions of tens of thousands of tons of additional deadly pollution. EPA's proposed weakening of these critical pollution protections for two vehicle model years exceeds the Agency's statutory authority.

First, EPA lacks legal authority to retroactively eliminate the MY 2027 Tier 4 Standards because the MY 2027 compliance year has already begun and the Agency lacks retroactive rulemaking authority.[31] Second, EPA's proposal to weaken the standards for NMOG+NOx for light-duty vehicles is inconsistent with Clean Air Act section 202(b)(1)(C)'s anti-backsliding mandate. EPA's Proposal would result in increased emissions of NOx and hydrocarbons (HC) from light-duty vehicles relative to the previously applicable Tier 4 standard, contrary to the statutory direction that "[a]ny revised standard shall require a reduction of emissions from the standard that was previously applicable." 42 U.S.C. § 7521(b)(1)(C). Third, EPA's proposal to weaken the standards for statutory heavy-duty vehicles[32] violates the statutory requirement in Clean Air Act Section 202(a)(3)(A)(i) that such standards "reflect the greatest degree of emission reduction achievable through the application of technology." 42 U.S.C. § 7521(a)(3)(A)(i). Fourth, the Proposal violates the Clean Air Act's conformity requirements, 42 U.S. Code § 7506(c)(1). EPA's Proposal fails to even address these governing statutory provisions and legal principles.[33] Each of these flaws independently renders the Proposal unlawful and outside the bounds of EPA's Clean Air Act authority.

A. The Proposal Exceeds EPA's Statutory Authority by Revising MY 2027 Standards Retroactively.

EPA's proposed weakening of the MY 2027 standards operates retroactively. MY 2027 can begin as early as January 2, 2026, for manufacturers, who are already in the process of complying with their MY 2027 obligations. *See* 40 C.F.R. § 86.1803-01 (defining "Model year" to begin as early as January 2 of the prior calendar year). EPA has already issued certificates of conformity for many MY 2027 vehicles. In fact, EPA admits that "some manufacturers have already certified some vehicle models to the final Tier 4 Standards for MY 2027." DRIA at 1-3. But even though manufacturers are already complying with MY 2027 Tier 4 Standards, and

[31] As we further explain in section II *infra*, even assuming EPA possesses retroactive rulemaking authority, the proposed exercise of such authority is arbitrary and capricious.

[32] The statute defines heavy-duty vehicles as those exceeding 6,000 pounds gross vehicle weight. 42 U.S.C. § 7521(b)(3)(C).

[33] EPA's failure to do so independently violates Section 307(d)(3)(C) of the Clean Air Act, which requires that the proposal's statement of basis and purpose discuss "the major legal interpretations ... underlying the proposed rule." 42 U.S.C. § 7607(d)(3)(C).

Americans are driving compliant vehicles on the road today, EPA nonetheless seeks to replace the MY 2027 Tier 4 Standards with weaker Tier 3 Standards.

Despite the evident retroactivity of its action, EPA's Proposal fails to discuss retroactivity at all and asserts no statutory retroactive rulemaking authority. In fact, EPA lacks authority to make such a retroactive change. "Retroactivity is not favored in the law." *Bowen v. Georgetown Univ. Hosp.*, 488 U.S. 204, 208 (1988). Thus, "a statutory grant of legislative rulemaking authority will not … be understood to encompass the power to promulgate retroactive rules unless that power is conveyed by Congress in express terms." *Bowen*, 488 U.S. at 208. The statute not only fails to confer retroactive rulemaking authority but explicitly and impliedly denies it. *See, e.g.*, *Board of Cnty Comms. v. EPA*, 72 F.4th 284, 292-93 (D.C. Cir. 2023); *Nat'l Mining Ass'n v. DOI*, 177 F.3d 1, 8 (D.C. Cir. 1999). *Cf. Gen. Motors Corp. v. NHTSA*, 898 F.2d 165, 177 (D.C. Cir. 1990) (affirming NHTSA's conclusion that Congress intended to provide certainty and finality with regard to a vehicle model year's applicable fuel-economy standards, and thus NHTSA's decision not to relax standards after the model year had begun).

The statute reflects Congressional recognition that emissions from the entire vehicle fleet contribute to human health and environmental harms. *See* 42 U.S.C. § 7401 (recognizing that "the increasing use of motor vehicles, has resulted in mounting dangers to the public health and welfare"). To address those emissions, in Section 202(a) Congress chose to focus EPA's regulation on "new" vehicles, and through the gradual process of fleet turnover, to clean up the whole fleet over time. The statute explicitly defines a "new" motor vehicle as "a motor vehicle the equitable or legal title to which has never been transferred to an ultimate purchaser." 42 U.S.C. § 7550(3).[34] Under Section 202 then, EPA only has prospective regulatory authority—over new vehicles where title has never been transferred to an ultimate purchaser. Once a vehicle has been sold and title transferred to an ultimate purchaser—as is the case for many MY2027 vehicles—EPA lacks authority to retroactively weaken requirements applicable to such vehicles.[35] Similarly, in listing acts prohibited by law for enforcement purposes, Congress explicitly prohibited the sale of a vehicle "manufactured after the effective date of regulations under this part which are applicable to such vehicle," unless such vehicle is covered by an EPA certificate of conformity. 42 U.S.C. § 7522(a)(1). This provision further clarifies that EPA's Section 202(a) regulatory authority is prospective, applicable only to those vehicles manufactured after their effective date.

EPA's limitation to prospectively regulating new vehicles is supported by the surrounding statutory context. The Section 202(a)(1) power to set and revise standards is based on determining whether emissions from the class of "new" vehicles "cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare." 42 U.S.C.

[34] The statute provides an analogous definition of new motor vehicle engines as "an engine in a new motor vehicle or a motor vehicle engine the equitable or legal title to which has never been transferred to the ultimate purchaser." 42 U.S.C. § 7550(3).

[35] For imported vehicles, the statute defines "new" motor vehicle differently, to mean a motor vehicle "manufactured after the effective date of a regulation issued under [Clean Air Act section 202] which is applicable to such vehicle or engine." 42 U.S.C. § 7550(3). For imported vehicles as well then, EPA's section 202(a) regulatory authority is prospective, applicable only to those vehicles manufactured after its regulation becomes effective.

§ 7521(a)(1). The use of the present tense in "cause, or contribute" as well as the phrase "reasonably be anticipated" indicates a predictive evaluation of ongoing and future impacts, and by extension prospective regulation, not retroactive power.

Similarly, Section 202(a)(2) describes the standards as "tak[ing] effect after such period as the Administrator finds necessary to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period." *Id.* § 7521(a)(2). That is, EPA must evaluate the amount of lead-time needed "after" the time of its rule to develop and apply advanced pollution control technologies. The intent of Section 202(a)(2) is to provide sufficient lead-time so that manufacturers can reasonably plan for their compliance. This too indicates prospective operation, not retroactive power.[36]

The statute also specifies more detailed lead-time provisions for discrete applications of the Section 202(a)(1) authority, and these are even less compatible with retroactive repeal. Notably, for revisions to certain heavy-duty criteria pollutant standards—including the Tier 4 NMOG+NOx and PM standards at issue here—the statute requires that they "apply for a period of no less than 3 model years beginning no earlier than the model year commencing 4 years after such revised standard is promulgated." 42 U.S.C. § 7521(a)(3)(C). This provision is obviously inconsistent with a retroactive revision of the standards.[37]

The statute also prescribes a compliance program under which manufacturers must obtain a certificate of conformity demonstrating compliance with EPA's Section 202 regulations. Consistent with prospective regulation, those certificates must be obtained in advance of the vehicles being sold, lest the manufacturer violate the statute. *See* 42 U.S.C. § 7522(a)(1).[38] The compliance program also requires manufacturers to guarantee that emission standards will be met over the course of the new vehicles' useful life. These continuing requirements are fixed at the time the vehicle is introduced into commerce,[39] and Congress nowhere granted the Agency freestanding authority to post hoc abrogate requirements for vehicles already in use.

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[36] To the extent EPA regards its revision of the MY 2027 standards as only prospectively applicable, that still does not resolve the lack of statutory authority. As explained above, EPA's authority to regulate vehicles in-use derives from standards and other requirements established for new vehicles. We acknowledge the Agency can appropriately adjust requirements for vehicles already in-use, for example, to certificates of conformity to implement the applicable standards or to improve its compliance and enforcement processes, *see, e.g.*, 42 U.S.C. § 7525(b)(2)(A) (authority to "suspend or revoke" certificates). But for the reasons stated in the text, the statute does not authorize the Agency to certify a vehicle to one set of requirements while new and then transform the regulatory program after the vehicle goes in-use.

[37] *See also, e.g.*, 42 U.S.C. § 7521(a)(3)(A)(i) (directing that EPA's standards for listed pollutants for heavy-duty vehicles "shall contain standards which reflect the greatest degree of emission reduction achievable through the application of technology which the Administrator determines *will be available* for the model year to which such standards apply," with the future tense "will be available" indicating prospective application (emphasis added)); *id.* § 7521(*l*)(2) (similar "will be available" language for mobile source air toxics authority).

[38] *See also, e.g., United States v. Volvo Powertrain Corp.*, 758 F.3d 330, 333 (2014) ("Under the Clean Air Act, manufacturers of new motor vehicle engines need to obtain certificates of conformity from the Environmental Protection Agency before selling their engines in the United States.").

[39] *See, e.g.*, 42 U.S.C. §§ 7521(a)(1), (d), 7522, 7525, 7541. For example, Section 202(a)(1) authorizes EPA to establish standards for "new" vehicles and engines that persist for the "useful life" of "such vehicles and engines." *Id.* § 7521(a)(1). Or for example, Section 207(a)(1) imposes a warranty requirement that requires the vehicle to be

This allocation of power is also reflected in the cooperative federalism scheme of motor vehicle regulation established throughout the Act. Under that scheme, EPA possesses primacy over new motor vehicles,[40] but States and localities retain their police powers over in-use vehicles.[41] EPA's proposal upends this longstanding statutory scheme by allowing the Agency to retroactively re-write the rules for existing vehicles, thereby intruding on state power. But EPA identifies no statutory authority or administrative precedent for this fundamental transformation of its authority, much less the "exceedingly clear language" required for agency actions that significantly alter the balance of Federal and State power. *Sackett v. EPA*, 598 U.S. 651, 679 (2023).

That EPA seeks to retroactively diminish existing regulatory obligations as opposed to imposing new ones does not salvage its lack of authority. As an initial matter, it is not clear that such a distinction matters for purposes of assessing retroactivity. *See Bowen*, 488 U.S. at 208 ("Retroactivity is not favored in the law. Thus, congressional enactments and administrative rules will not be construed to have retroactive effect unless their language requires this result.") In any event, EPA is not merely proposing to diminish existing obligations. Rather, as we explain further in subsection II-B *infra*, EPA is also significantly undermining the reliance interests of regulated entities and other stakeholders, impairing the value of past business transactions, and penalizing companies that have made significant investments to produce cleaner vehicles than their competitors. Particularly given the statutory focus on providing automakers with sufficient lead-time, 42 U.S.C. 7521(a)(2), the Agency's retroactive elimination of Tier 4 regulations for the current model year contradicts "familiar considerations of fair notice, reasonable reliance, and settled expectations." *Landgraf v. USI Film Prods.,* 511 U.S. 244, 270 (1994).

"designed, built, and equipped so as to conform at *the time of sale* with applicable regulations," and Section 207(c)(3)(A) requires each manufacturer to furnish maintenance instructions "with each new motor vehicle." *Id.* § 7541(a)(1) (emphasis added), (c)(3)(A).

[40] EPA's regulatory power over new motor vehicle emissions is subject to the California waiver provision, under which the Agency must waive preemption for California motor vehicle emission standards if they meet certain statutory criteria. 42 U.S.C. § 7543(b).

[41] *See* 42 U.S.C. § 7543(a), (d); *Salt Lake Cnty. v. Volkswagen Grp. of Am., Inc. (In re Volkswagen "Clean Diesel" Mktg., Sales Practices, & Prods. Liab. Litig.)*, 959 F.3d 1201, 1215 (9th Cir. 2020) ("although Congress displaced state emission standards for new motor vehicles in 1967, it has maintained a substantial role for states in post-sale implementation and enforcement ever since" (cleaned up)); *Allway Taxi, Inc. v. City of New York*, 340 F. Supp. 1120, 1124 (S.D.N.Y. 1972) ("The preemption sections ... do not preclude a state or locality from imposing its own exhaust emission control standards upon the resale or reregistration of the automobile. Nor do they preclude a locality from setting its own standards for the licensing of vehicles for commercial use within that locality."); *see also, e.g.*, 42 U.S.C. § 7550 (defining regulated manufacturers as persons who, among other things, make "new motor vehicles," and further defining "new motor vehicle"); *id.* § 7408(f) (requiring the Administrator to make available information about in-use transportation control measures to appropriate Federal, State, and local agencies); *id.* § 7410(a)(5)(i) (limiting the Administrator's authority over indirect source review programs and indicating such authority remains within the power of State and local governments); *id.* § 7511a (State authority and requirements over vehicle inspection and maintenance programs); *id.* § 7512a (same); *id.* §§ 7401(a)(3), 7407(a).

B. The Proposal Violates Clean Air Act Section 202(b)(1)(C)'s Anti-Backsliding Prohibition.

In Section 202(a)(1)-(2), Congress enacted a comprehensive scheme for EPA to "prescribe (and from time to time revise) in accordance with the provisions of this section" motor vehicle emission standards. 42 U.S.C. § 7521(a)(1). This general authority, however, is not unbounded, but subject to discrete statutory limitations. In Section 202(b)(1), Congress provided specific directions on how EPA was to exercise its Section 202(a) authority to establish light-duty standards for NOx, HC, and carbon monoxide. Of note, Section 202(b)(1)(C) specifies the statutory bounds for revising such standards, including its anti-backsliding mandate that "[a]ny revised standard shall require a reduction of emissions from the standard that was previously applicable." EPA's Proposal, however, increases NOx and HC emissions from light-duty vehicles, and is thus contrary to law. *See* 91 Fed. Reg. at 28,477 tbl.12; DRIA at 2-5 tbl.2-3.

Section 202(b)(1)(C) applies to EPA's weakening of the NMOG+NOx standards for light-duty vehicles. Although EPA neglects to mention this provision, it asserts that its revision authority arises from section 202(a)(1)-(2). *See* 91 Fed. Reg. at 28,474-75. Section 202(a) prefaces all its authority-granting provisions with the proviso "[e]xcept as otherwise provided in subsection (b)." Section 202(b) contains section 202(b)(1)(C), which reads in full:

> The Administrator may promulgate regulations under subsection (a)(1) revising any standard prescribed or previously revised under this subsection, as needed to protect public health or welfare, taking costs, energy, and safety into account. *Any revised standard shall require a reduction of emissions from the standard that was previously applicable.* Any such revision under this subchapter may provide for a phase-in of the standard. It is the intent of Congress that the numerical emission standards specified in subsections (a)(3)(B)(ii), (g), (h), and (i) shall not be modified by the Administrator after November 15, 1990, for any model year before the model year 2004.

42 U.S.C. § 7521(b)(1)(C) (emphasis added).

The first sentence authorizes EPA to revise "any standard prescribed or previously revised under" section 202(b), that is, the CO, NOx, and HC standards, described earlier in Section 202(b)(1)(A)-(B). This sentence clarifies that this revision authority extends not only to "any standard prescribed ... under" Section 202(b) but also to further revisions of "any standard ... previously revised under this subsection."

The second sentence contains the anti-backsliding mandate, which indicates that "[a]ny revised standard shall require a reduction of emissions from the standard that was previously applicable." At the very least, this mandate applies to those standards described in the prior section: any revision of a CO, NOx, and HC standard for light-duty vehicles.[42] Thus,

[42] The anti-backsliding could be read more broadly to encompass any Title II standard, including all other standards that EPA is proposing to weaken for both light- and heavy-duty vehicles. The statute uses the language of "[a]ny revised standard," without tying this back to the first sentence regarding light-duty vehicle CO, NOx, and HC revisions. Moreover, the subsequent sentences in Section 202(b)(1)(C) also reach far beyond the scope of the first

notwithstanding EPA's more general authority to revise standards, Congress plainly defined EPA's power to regulate CO, NOx, and HC emissions as a one-way ratchet toward public-health protection, precluding the agency from weakening a previously applicable standard.[43]

This one-way ratchet applies here. First, EPA is revising NOx and HC standards for light-duty vehicles in this rulemaking. The NMOG+NOx standards prescribe average standards for NMOG and NOx.[44] As the name NMOG+NOx indicates, these standards regulate NOx. NMOG stands for "non-methane organic gases," and it refers to HC except for methane.[45] Thus, revising NMOG standards is a revision of standards for HC. *Cf.* DRIA at 2-2 (explaining that EPA modeled its action by changing emissions rates for "total hydrocarbons"). The agency is proposing to revise the regulatory text of these standards, resulting in weakening the numerical emissions limitations for MYs 2027 and 2028 to Tier 3 levels.

Second, EPA's proposed revision does not "require a reduction of emissions" of NOx and HC but rather permits vehicles to increase them. Even by the Proposal's own accounting,[46] it is estimated to result in greater NOx emissions, exceeding hundreds and even a thousand tons in some years, and over 18,000 tons over the life of the program. *See* 91 Fed. Reg. at 28,477 tbl.12.; DRIA at 2-5 tbl.2-3. EPA's proposed revision is also projected to result in hundreds of tons annually of greater emissions of VOCs[47] (a subcategory of HC), totaling thousands of tons over the life of the program. *See* 91 Fed. Reg. at 28,477 tbl.12.; DRIA at 2-5 tbl.2-3. These pollution

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sentence, with references to "[a]ny such revision under this subchapter" and to assorted light- and heavy-duty standards specified in subsections "(a)(3)(B)(ii), (g), (h), and (i)." 42 U.S.C. § 7521(b)(1)(C).

[43] Congress provided for limited waivers of these standards, none of which are applicable here. *See, e.g.*, 42 U.S.C. § 7521(b)(1)(A)-(B), (3). Note the statute contains two instances of Section 202(b)(3), and the waiver text is contained in the second instance of that provision.

[44] Both NMOG and NOx react in the presence of sunlight to create deadly smog. EPA has historically regulated these compounds together to directly address two primary smog precursors while giving vehicle manufacturers engineering flexibility to reduce either NOx or NMOG. *See* 79 Fed. Reg. 23,428, 23,489 (Apr. 28, 2014).

[45] *See, e.g.*, 40 C.F.R. § 86.1803-01 ("Non-methane organic gases (NMOG) means the sum of oxygenated and non-oxygenated hydrocarbons contained in a gas sample as measured using the procedures described in 40 CFR 1066.635."). EPA previously determined to not regulate methane in its hydrocarbon regulations because its relatively low photochemical reactivity makes it a negligible contributor to local smog episodes. *See* 46 Fed. Reg. 62,366, 62,366 (Dec. 23, 1981) ("The need to control hydrocarbon emissions from mobile sources was and is, therefore, based on the part played by each species in the formation of photochemical smog. Methane was recognized as being nonreactive in this process and was excluded ...."). On longer time frames, however, methane aggravates ozone pollution both directly, by reacting to form ozone, and indirectly, by warming the atmosphere and accelerating ozone-forming chemistry. *See, e.g.*, J. Jason West et al., *Global Health Benefits of Mitigating Ozone Pollution with Methane Emission Controls*, 103 Proc. Nat'l Acad. Sci. 3988 (2006), https://www.pnas.org/doi/10.1073/pnas.0600201103; Neal Fann et al., *Associations Between Simulated Future Changes in Climate, Air Quality, and Human Health*, 4 JAMA Netw Open. (2021), https://pubmed.ncbi.nlm.nih.gov/33394002/.

[46] As we explain in subsection II-A-1-b *infra*, EPA underestimated the emission increases resulting from its Proposal.

[47] For purposes of assessing emissions impacts, EPA analyzes VOC as opposed to NMOG or HC. VOCs comprise any compound of carbon that participates in atmospheric photochemical reactions to create ground-level ozone and excludes hydrocarbon compounds with negligible photochemical reactivity, such as methane as well as ethane, acetone, and other compounds. *See* 40 C.F.R. § 51.100(s). Thus, VOC changes are most relevant for assessing changes in ozone precursors that result in deadly smog.

increases would significantly worsen deadly smog and soot, endangering public health and welfare.

The plain language of Section 202(b)(1)(C) accords with EPA's historical interpretation, which it promulgated shortly after the 1990 Clean Air Act Amendments that enacted the current version of Section 202(b)(1)(C). *See Loper Bright*, 603 U.S. at 385-86 (according "very great respect" to the "contemporaneous construction" of statutes by the agency charged with administering the statute, "especially" "when an Executive Branch interpretation was issued roughly contemporaneously with enactment of the statute and remained consistent over time"). In the Tier 1 Light-Duty Final Rule, EPA implemented the 1990 Amendments that required EPA to establish new non-methane hydrocarbon standards (NMHC). *See* 42 U.S.C. § 7521(g), (h). Previously, EPA had established total hydrocarbon (THC) standards. Commenters argued that "retention of the THC standard was neither required by statute nor productive in air quality terms." 56 Fed. Reg. 25,724, 25,731 (June 5, 1991).[48] In response, EPA did not question the commenters' allegations regarding whether the standards were productive. Rather, the Agency stated that "it has no legal basis on which to eliminate the existing THC standards. The EPA is prohibited from doing so by section 202(b)(1)(C) of the Act, which states that 'Any revised standard shall require a reduction of emissions from the standard that was previously applicable.' Eliminating the THC standard would not comply with this requirement." 56 Fed. Reg. at 25,731. The same result follows here. Regardless of EPA's new findings about whether the standards are appropriate—findings that are wrong, as we explain in section III—Section 202(b)(1)(C) means the Agency "has no legal basis on which to eliminate the existing [NMOG+NOx] standards."

The plain reading of Section 202(b)(1)(C) also aligns with statutory structure and purpose. The D.C. Circuit has found that the Clean Air Act "[c]onsidered as a whole … reflects Congress's intent that air quality should be improved until safe and never allowed to retreat thereafter. Even if EPA set requirements that proved too stringent and unnecessary to protect public health, EPA [is] forbidden from releasing states from these burdens." *S. Coast Air Quality Mgmt. Dist. v. EPA*, 472 F.3d 882, 900 (D.C. Cir. 2006); *see also, e.g., Kentucky Res. Council, Inc. v. EPA*, 467 F.3d 986, 995 (6th Cir. 2006) (Clean Air Act anti-backsliding protections prevent EPA from approving a SIP revision if "the agency finds it will make the air quality worse"). This general anti-backsliding policy is implemented not only in Section 202 but also throughout the Act, including in requirements for State Implementation Planning (*see* 42 U.S.C. § 7410(*l*)) and Prevention of Significant Deterioration and Non-Attainment Areas (*see, e.g.*, 42 U.S.C. §§ 7470–7479, 7502(e), 7503, 7505a, 7506(c), 7515). Along with the anti-backsliding mandate in section 202(b)(1)(C), Congress enacted many other anti-backsliding requirements in the 1990 Amendments, evincing its intent to codify anti-backsliding principles more broadly at that time. While each provision differs, they share in ensuring that once pollution controls are adopted, they generally cannot be removed so as to permit air quality to degrade.

In addition, preventing EPA from weakening of the Tier 4 light-duty NMOG+NOx standards accords with Congress's interest in providing regulatory certainty for stakeholders. The statutory structure ensures such certainty both by allowing regulated entities sufficient lead-time

[48] *See also* Summary and Analysis of Comments on the NPRM: Control of Air Pollution from New Motor Vehicles and New Motor Vehicle Engines: Gaseous and Particulate Emission Regulations for 1994 and Later Model Year Light-Duty Vehicles and Light-Duty Trucks 13-15, Docket No. A-90-43, Doc. No. 10) V-C-1.

to plan their products in advance of new regulation, as well as by protecting reliance interests of businesses in their compliance with existing regulations. As for the latter, vehicle manufacturers expend significant resources in planning for and achieving compliance with emission standards. *See* 91 Fed. Reg. at 28,472. A limit on weakening standards ensures that companies that have in good faith planned for compliance by making significant investments do not perversely find themselves at a competitive disadvantage because the Agency subsequently weakens the standards, a topic we further discuss in section III.C below.

Preventing EPA from weakening the light-duty NMOG+NOx standards also protects the reliance interests of States and local governments. Mobile source pollution contributes significantly to the emissions inventory and ambient air quality in many parts of the United States. States and local governments have air quality obligations under the Clean Air Act, and they routinely rely on emissions reductions achieved through EPA's mobile source rules in developing and formulating their State Implementation Plans (SIP), as well as in taking other Clean Air Act actions, such as making transportation conformity and general conformity determinations.[49] Limiting the weakening of these standards ensures that States and local governments can confidently rely on EPA's mobile source emission rules for satisfying their own air quality obligations, without subsequently discovering that the standards no longer exist and needing to come up with new and more burdensome State and local measures on stationary or other sources.

Particularly as applied to existing MY 2027 vehicles, preventing EPA from weakening the light-duty NMOG+NOx standards also protects the interests of consumers. Several Title II provisions—including those related to consumer warranty, recall, and onboard diagnostics (*see* 42 U.S.C. §§ 7541(c), 7525(b)(2), 7521(m))—evince legislative concern with protecting the interests of vehicle purchasers. A limit on repeals further ensures that once a consumer purchases a vehicle that achieves certain emissions requirements, that consumer can expect those requirements to function over the vehicle's useful life and not be undermined by subsequent regulatory developments. By contrast, weakening the standards, especially as applied to existing MY 2027 vehicles already purchased and in operation, would retroactively harm consumers' interest in driving clean vehicles.

As for statutory purpose, Section 202(a)(1)'s purpose and that of the Act generally is "to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare." 42 U.S.C. § 7401(b)(1); *see also Manchester Env't Coal. v. EPA*, 612 F.2d 56, 61 (2d Cir. 1979) ("the overriding goal of the Clean Air Act, namely, clean air"). Congress contemplated that such protections would not merely decrease harmful air pollutants, but should lead to their complete elimination. *See* 42 U.S.C. § 7401(a)(2)-(3), (c). Congress further recognized that such purposes could only be achieved by imposing some social costs, and it made the choice that society should bear those costs, given the "mounting dangers to the public health and welfare" of "the increasing use of motor vehicles" and the critical importance of air quality "to promote the public health and welfare and the productive capacity of [the Nation's]

[49] *See* subsections I-D & II-B-2 *infra*; EPA, *MOVES5 Policy Guidance*, EPA-420-B-24-038, at 3 (Nov. 2024), https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P101CTLB.pdf (providing guidance to States and local governments on the MOVES emissions model for SIP development and noting the incorporation of EPA's latest mobile source regulations, including the 2024 Rules into the emissions model).

population." *Id.* § 7401(a)(2), (b)(1); *see Motor & Equip. Mfrs. Ass'n. v. EPA*, 627 F.2d 1095, 1118 (D.C. Cir. 1979) (MEMA I) ("Every effort at pollution control exacts social costs. Congress, not the Administrator, made the decision to accept those costs."). But EPA's proposed weakening of the light-duty NMOG+NOx standards would result in large amounts of increased pollution, and consequent harms to public health and welfare, as we document in section III.B. EPA's proposal to exceed its authority thus also directly conflicts with the statutory purpose.

C. The Proposal Violates the Statutory Requirements for Heavy-Duty Vehicle Regulations in Clean Air Act Section 202(a)(3)(A)(i).

EPA's proposal to weaken the NMOG+NOx and PM standards for statutory heavy-duty vehicles[50] violates the requirement in Section 202(a)(3)(A)(i) that such standards "reflect the greatest degree of emission reduction achievable through the application of technology." 42 U.S.C. § 7521(a)(3)(A)(i). Section 202(a)(3) generally governs emissions of listed pollutants, including HC, NOx, and PM, from heavy-duty vehicles. Section 202(a)(3)(A)(i) states in full:

> Unless the standard is changed as provided in subparagraph (B), regulations under paragraph (1) of this subsection applicable to emissions of hydrocarbons, carbon monoxide, oxides of nitrogen, and particulate matter from classes or categories of heavy-duty vehicles or engines manufactured during or after model year 1983 shall contain standards which reflect the greatest degree of emission reduction achievable through the application of technology which the Administrator determines will be available for the model year to which such standards apply, giving appropriate consideration to cost, energy, and safety factors associated with the application of such technology.

Id.

This provision clearly applies to any revision of the Tier 4 NMOG+NOx and PM standards for heavy-duty vehicles, as confirmed by the original Tier 4 rule establishing those standards. *See* 89 Fed. Reg. at 27,890, 27,932, 27,934, 27,937, 27,939.[51] EPA now proposes to revise those standards.[52] Even EPA's Proposal impliedly concedes this, as it indicates that the lead-time provisions provided in Section 202(a)(3)(C) apply to heavy-duty vehicles. By their terms, those lead-time provisions apply to "[a]ny standard promulgated or revised under this

[50] The statute defines heavy-duty vehicles as those exceeding 6,000 pounds gross vehicle weight. 42 U.S.C. § 7521(b)(3)(C). These include vehicles referenced in the Proposal as medium-duty vehicles (MDV), medium-duty passenger vehicles (MDPV), and certain light-duty trucks (LDT3-4).

[51] For example, the 2024 Rule states "EPA finds that the standards in this final rule satisfy the requirement for 'greatest degree of emission reduction achievable' for vehicles above 6,000 lb GVWR, and has adopted a default compliance schedule to ensure adequate lead time and stability for these vehicles, as well as an optional compliance schedule." 89 Fed. Reg. at 27,934.

[52] *See, e.g.*, 91 Fed. Reg. at 28,473 tbl.8-9 (proposing revision to "100% Tier 3" for default and early compliance pathways for heavy-duty vehicles for MY2027-28); *id.* at 28,482 (regulatory text effectuating delay of "criteria exhaust emission standards ... for both light-duty program vehicles and medium-duty vehicles" until "model year 2029").

paragraph," i.e., Section 202(a)(3),[53] which in this case can refer only to standards revised under Section 202(a)(3)(A)(i).[54]

EPA, however, neglects to even mention Section 202(a)(3)(A)(i) or its requirement that the standards "reflect the greatest degree of emission reduction achievable through the application of technology," considering costs and other factors. 42 U.S.C. § 7521(a)(3)(A)(i). And EPA does not even claim, much less justify, that weakening the MY 2027-28 heavy-duty standards to Tier 3 levels could possibly reflect the "greatest degree of emission reduction achievable." *Id.* And while EPA offers broadbrush remarks about changed circumstances putatively applicable to the vehicle market, its detailed analysis of statutory factors—including its review of the Agency's compliance data and its modeling of costs—appears to be limited to vehicles under 6,000 pounds. *See* DRIA at 1-3 (noting that EPA "focused the Agency's assessment of changes in costs and other impacts on those vehicles up to 6,000 lbs. GVWR" and going on to only present quantitative technical assessments for vehicles up to 6,000 pounds).

For example, the Agency provides no cost estimates for heavy-duty vehicles, even though it has historically done so and such estimates obviously continue to be possible, and even though the Agency provides costs estimates for light-duty vehicles. Regardless of what limited discretion the Agency might claim under Section 202(a)(3)(A)(i)—which undoubtedly requires EPA to prioritize emissions reductions[55]—there is obviously no authority to revise the standard without even acknowledging the statutory requirements and without analyzing each statutory factor as it specifically applies to heavy-duty vehicles. The Act does not countenance EPA's rulemaking by fiat. And as we explain in Section III.B, the MY 2027-28 standards remain eminently feasible, including through some of the exact technologies described in the original Tier 4 rule.

D. The Proposal Violates the Clean Air Act's Conformity Requirements.

The general conformity rule of the Clean Air Act, 42 U.S.C. § 7506(c)(1), provides in relevant part that:

> [n]o department, agency, or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license or permit, or approve, any activity which does not conform to an implementation plan after it has been approved or promulgated under section 7410 of this title.

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[53] *See* 91 Fed. Reg. at 28,467 & n.14 (explaining applicability of Section 202(a)(3)(C)); 42 U.S.C. § 7521(a)(3)(C) ("Any standard promulgated or revised under this paragraph and applicable to classes or categories of heavy-duty vehicles or engines shall apply for a period of no less than 3 model years beginning no earlier than the model year commencing 4 years after such revised standard is promulgated.").

[54] There are some other standard-setting authorities in Section 202(a)(3), such as those relating to rebuilding and motorcycles, which are not applicable here.

[55] *See* 89 Fed. Reg. at 27,891 n.465 (explaining that under Section 202(a)(3)(A), "EPA thus lacks discretion to base such standards on a technological pathway that reflects less than the greatest degree of emission reduction achievable for the class (giving consideration to cost, energy, and safety)").

Here, the Proposal is clearly an "activity" of the federal government, and so it may not be finalized unless it conforms to "an implementation plan's purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and achieving expeditious attainment of such standards," 42 U.S.C. § 7506(c)(1)(A), and will not:

> cause or contribute to any new violation of any standard in any area; increase the frequency or severity of any existing violation of any standard in any area; or delay timely attainment of any standard or any required interim emission reductions or other milestones in any area.

Id. § 7506(c)(1)(B). Because the Rule will allow greater criteria pollutant emissions from covered vehicles for a period of at least two years, and extending over the lifetimes of those vehicles that otherwise would have had to comply with the Tier 4 Standards, it will result in an increase in NOx and other pollutants in States and regions with nonattainment or maintenance plans.

For example, the South Coast Air Basin in southern California is in extreme non-attainment for ozone and relies on NOx reductions for attainment of the ozone NAAQS. Because of the geology, geography, and atmospheric chemistry in the South Coast Air Basin, the South Coast Air Quality Management District is relying on NOx reductions from new vehicles to reduce ozone concentrations. In its 2022 Air Quality Management Plan, the South Coast Air Quality Management District explained that "NOx needs to be reduced by about 67 percent beyond the current 2037 baseline and about 83 percent below current levels."[56] Similarly, the San Joaquin Valley Air Basin is in extreme non-attainment for the ozone NAAQS. The San Joaquin Valley Air Quality Management District relies on NOx reductions of 72% by 2037 to meet the 2015 ozone NAAQS.[57] These are enormous reductions in NOx and will be difficult to achieve in any event. For regions like South Coast and San Joaquin Valley facing the statutory penalties that accompany extreme non-attainment and the difficulty of implementing further reductions in spite of already stringent local standards, every ton of NOx reduction matters.

As another example, the ten-county Dallas-Fort Worth region has been classified as a severe nonattainment area for the 2008 8-hour ozone NAAQS since 2022.[58] In the Dallas-Fort Worth severe nonattainment area, mobile source emissions dominate the NOx inventory, and Texas' SIP relies heavily on NOx reductions to be delivered by federal motor vehicle standards.[59] The New York-Northern New Jersey-Long Island region is also classified as a serious nonattainment area for the 2015 8-hour ozone standard and relies in part on NOx

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[56] S. Coast Air Quality Mgmt. Dist., *Final 2022 Air Quality Management Plan* at ES-4 (2022), https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/03-es.pdf?sfvrsn=95c5bd61_6.

[57] San Joaquin Valley Air Pollution Control Dist., *2022 Plan for the 2015 8-Hour Ozone Standard* (2022), *available at* https://www.valleyair.org/media/q55posm0/0000-2022-plan-for-the-2015-8-hour-ozone-standard.pdf.

[58] *See* EPA, *8-Hour Ozone (2008) Nonattainment Area Ares/State/County Report* (June 30, 2026), https://www3.epa.gov/airquality/greenbook/hnca.html#Ozone_8-hr.2008.Dallas.

[59] *See Revisions to the State of Texas Air Quality Implementation Plan for the Control of Ozone Air Pollution* (Apr. 2024), https://www.tceq.texas.gov/downloads/air-quality/sip/ozone/dfw/naaqs-2008/23107sip_2008-o3-dfw-sev-ad_backup_package.pdf.

reductions to meet the ozone NAAQS.[60] Any increase in NOx emissions over the lifetime of MY 2027-2028 vehicles will be an additional, material, and continuing hurdle in the way of NAAQS attainment for ozone for these and other areas across the country.[61]

In addition, the Proposal will affect state and local planning decisions in ozone non-attainment areas. Under 42 U.S.C. § 7506(c), conformity applies to long-range metropolitan transportation plans, shorter-term metropolitan transportation improvement programs (TIPs), and transportation projects funded or approved by the Federal Highway Administration or the Federal Transit Administration, under the rubric of transportation conformity. In essence, transportation conformity means that implementation of a metropolitan transportation plan, TIP, or project will not cause any new violations of an air quality standard, increase the frequency or severity of violations of the standard, or delay timely attainment of the standard or any interim milestone.[62] Future transportation projects will need to account for extra NOx emissions from vehicles using new roadways as a result of this Proposal, possibly imperiling desired changes. Past projects may become subject to transportation conformity attack if the project's conformity analysis would be changed by new data showing higher NOx emissions than previously planned because of the Proposal.

The docket materials supporting the Proposal evidence that EPA understood its Proposal violates conformity requirements and obstructs State compliance with federal mandates, but EPA nonetheless did not even attempt to explain how the Proposal could be reconciled with the statute. During the interagency review process, a sister-agency commenter noted that the Proposal "will likely have the effect of increasing emissions nationally," and thereby "impose unanticipated burdens on States [agencies] who are responsible for implementing transportation conformity requirements under the Clean Air Act" and "put[] at risk State [agencies] transportation funding and long-planned projects." *See* EPA-HQ-OAR-2025-3297-0054, Att. 11, at 1. The commenter further noted, correctly, that the Proposal's DRIA fails to account for additional associated costs. *Id.* Despite EPA's acknowledgement of these comments during the interagency review process, *see id.*, the Proposal fails to address or even acknowledge the Clean Air Act's conformity requirements and associated costs for States, compounding EPA's statutory violation with arbitrary failure-to-explain error.

Because the Proposal will interfere with achieving and "delay timely attainment" of the ozone NAAQS in the two air districts with the worst ozone pollution in the country, and

[60] *See New York State Implementation Plan for the 2008 Ozone National Ambient Air Quality Standards* (Nov. 2021), https://extapps.dec.ny.gov/docs/air_pdf/sipseriouso3nyma.pdf.

[61] Twenty-seven air basins across the country are in serious nonattainment or worse for the 2015 ozone NAAQS. *See* EPA, *8-Hour Ozone (2015) Nonattainment Areas* (June 30, 2026), https://www3.epa.gov/airquality/greenbook/jnc.html.

[62] *See* U.S. Dep't of Transp., *Transportation Conformity: A Basic Guide for State & Local Officials* at 2 (Feb. 2017), https://www.fhwa.dot.gov/environment/air_quality/conformity/2017_guide/fhwahep17034.pdf.

potentially other regions, as well,[63] it violates the Clean Air Act's transportation conformity requirements and must be withdrawn.

II. The Proposal Is Arbitrary and Capricious.

Even if EPA has statutory authority for the Proposal, which it does not, the Proposal is arbitrary and capricious and unlawful and must be withdrawn. EPA fails to rationally balance the statutory factors it must consider under Section 202—including reducing dangerous emissions, technological feasibility, lead time, and costs—and unlawfully fails to prioritize the key statutory objective of protecting public health. EPA further fails to adequately explain its change in position from just a few years ago when it adopted the Tier 4 Standards on a robust record with extensive evidentiary analysis regarding the same statutory factors. EPA also fails to adequately consider the interests of the public, States and local governments, vehicle purchasers, manufacturers, and other parties who significantly rely on the Tier 4 Standards and would be harmed by the Proposal, and EPA fails to consider a range of reasonable alternatives that would be less damaging to public health and significant reliance interests.

Overall, it is apparent that the Proposal is an arbitrary and unlawful attempt to weaken existing standards for near-term model year vehicles under the guise of a "delay" while EPA buys time to propose and finalize its follow-on rulemaking, which is very likely seek to undermine the entire Tier 4 program on the basis of similar rationales. Because this Proposal is an unlawful abdication of EPA's statutory mandate to protect public health, is wholly unsupported, and is contradicted by the facts, EPA should immediately withdraw it.

A. EPA's Consideration of the Statutory Factors Is Unreasonable and Renders the Proposal Unlawful.

1. EPA's Consideration of Lost Emissions Reductions Is Arbitrary and Unreasonable.

Reducing and eliminating harmful emissions is the central aim of Section 202(a)(1) and the Clean Air Act generally. Yet EPA barely acknowledges—let alone justifies with the specificity needed when reversing its prior actions—that the Proposal would harm human health and welfare and interfere with air-quality planning across the country. Instead, in an abrupt break from its longstanding prior practice in vehicle emissions standards rulemakings, EPA proposes to weaken the Tier 4 Standards while refusing to monetize the attendant emissions harms. Indeed, EPA fails to even quantify entire categories of health and welfare damages, such as premature mortality. The limited health harm analysis EPA did conduct underestimates those harms. These analytical failures are arbitrary and unlawful. No rational justification could support this unnecessary proposed reversal of important health protections.

[63] The South Coast (Los Angeles area) and San Joaquin Valley air basins are the only areas in the country currently designated by EPA as in "extreme non-attainment" for the 2015 ozone NAAQS. *See* EPA, *8-Hour Ozone (2015) Nonattainment Areas* (June 30, 2026), https://www3.epa.gov/airquality/greenbook/jnc.html.

a. The Proposal Is Unreasonable Because EPA Fails to Prioritize Emissions Reductions in Its Balancing of Statutory Factors.

Seeking to justify the weakened Tier 4 Standards, EPA states that Section 202(a) "does not specify how much weight to apply to each [statutory] factor" and that it may therefore "determine an appropriate balance between stringency, technology considerations, cost, and lead time." 91 Fed. Reg. at 28,475. More pointedly, EPA cites cases for the proposition that it must be accorded not just discretion but "particularly great deference" when setting standards based "on complex scientific or technical analysis," *id.* at 28,475 n.54 (citing *Nat'l Petrochemical & Refiners Ass'n v. EPA,* 287 F.3d 1130, 1135 (D.C. Cir. 2002)). As described below, EPA provides no complex scientific or technical analysis of any factor—and in some instances, no analyses at all—in support of the Proposal; to the contrary, it withheld relevant underlying data in its possession from public examination. But setting aside the deep flaws in how EPA evaluated any Section 202(a) statutory factor, as detailed below, EPA erred more fundamentally: it is not entitled to the deference it claims, does not have unfettered discretion to balance statutory factors however it likes, and must give central weight to the need to reduce harmful vehicle emissions—the express aim of Section 202(a).[64]

The text, structure, and purpose of Section 202(a)(1) demonstrate the key importance Congress gave to emissions reductions and their protection of public health and welfare. Section 202(a)(1) itself defines that core purpose and EPA's duty when setting standards. It orders that the Administrator "shall" prescribe standards that "*prevent or control*" pollution that "endanger[s] public health or welfare." 42 U.S.C. § 7521(a)(1) (emphasis added). And in Section 202(a)(3)(A)(i), Congress ratcheted up even this demanding burden for heavy-duty-vehicle pollution by instructing EPA to obtain "the greatest degree of emission reduction achievable" for heavy-duty vehicle pollutants, underscoring the primary importance of harm reduction. *Cf. Husqvarna AB v. EPA,* 254 F.3d 195, 200 (D.C. Cir. 2001) (under section 213's technology-forcing authority "EPA did not deviate from its statutory mandate or frustrate congressional will by placing primary significance on the 'greatest degree of emission reduction achievable'" and considering cost and other statutory factors as of secondary importance).

Further, Section 101(a) states Congress' intent in promulgating the Clean Air Act in clear and explicit language, setting forth the "Congressional findings and declaration of [the Act's] purpose." 42 U.S.C. § 7401(a). Congress declared that purpose to be "to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare," *id.* § 7401(b)(1): It defined "pollution prevention" as "the *reduction or elimination*, through any measure, of the pollutants produced or created at the source", *id.* § 7401(a)(3) (emphasis added). And it stated that "Federal … leadership is essential … to prevent and control air pollution," *id.* § 7401(a)(4). Congress plainly intended EPA's actions not only to decrease pollutants but to eliminate them. *See* 42 U.S.C. § 7401(a)(2)-(3), (c). In light of such clear language, EPA cannot balance the Section 202(a) factors in a manner that thwarts Congress' directive and arbitrarily overrides the Act's core function of pollution reduction and public health protection.

[64] Even a new administration is prohibited from choosing "not to enforce laws of which it does not approve, or to ignore statutory standards in carrying out its regulatory functions." *State Farm*, 463 U.S. at 59 n.8.

Unsurprisingly, caselaw contradicts EPA's proposition that it may balance the statutory factors as it pleases and ignore Congress's central aim. Noting that in Section 202(a), "EPA has been charged with protecting the public's 'health' and 'welfare,'" the Supreme Court in *Massachusetts v. EPA* rejected a host of arguments EPA proffered to show it could avoid this duty even if it were to find endangerment as long as, in its own judgment, "it would be unwise to do so." 549 U.S. 497, 532 (2007). Pointedly, the Court held that "the use of the word 'judgment' [in Section 202(a)(1)] is not a roving license to ignore the statutory text" and ordered EPA to determine endangerment. *Id*. at 533. While the Court in *Massachusetts* addressed endangerment by greenhouse gases, its holding applies just as forcefully to criteria pollutants and air toxics. *See also Manchester Env't Coal.*, 612 F.2d at 61 (referencing "the overriding goal of the Clean Air Act, namely, clean air"). Congress directed that such protections would not merely decrease harmful air pollutants but should lead to their complete elimination. *See* 42 U.S.C. § 7401(a)(2)-(3), (c).

Though EPA styles the Proposal as a mere delay of the Tier 4 Standards, it would immediately (and retroactively) decrease stringency and harm public health and welfare. EPA thus must meet the exacting burden of justifying an outcome with effects contrary to the statute's primary purpose. It has not. As the D.C. Circuit observed in another case involving a proposed "delay" of standards under Section 111(d):

> EPA's weak grounds for … compliance delays in the amended implementing regulations are overwhelmed by its total disregard of the added environmental and public health damage likely to result from slowing down the entire Section 7411(d) regulatory process.… The extensions of implementation deadlines here give no consideration to the need for speed.… Control of emissions from existing sources before they harm people and the environment is the *central purpose of Section 7411(d) of the Clean Air Act*.

Am. Lung Ass'n v. EPA, 985 F.3d 914, 993 (D.C. Cir. 2021) (emphasis added), *rev'd & remanded on other grounds by West Virginia v. EPA,* 597 U.S. 697 (2022); *see also Air Alliance Houston v. EPA,* 906 F.3d 1049, 1066 (D.C. Cir. 2018) (rejecting EPA's attempted delay of standards while it reconsidered them as EPA "may not 'substitut[e] [its] desires for the plain text' of the Act" (*quoting New Jersey v. EPA*, 517 F.3d 574, 582–83 (D.C. Cir. 2008)).

Similarly, in dismissing EPA's claim that it could not consider total air emissions when setting a New Source Performance Standard under Section 111, the court in *Sierra Club v. Costle* stated that "we can think of no sensible interpretation of the statutory words 'best technological system' which would not incorporate the amount of air pollution as a relevant factor to be weighed when determining the optimal standard for controlling sulfur dioxide emissions. … In fact, we do not see how we could uphold a variable standard *if EPA had not evaluated its effect on air emissions.*" 657 F.2d 298, 326 (D.C. Cir. 1981) (emphasis added); *see also Manchester Env't Coal,* 612 F.2d at 61 ("the overriding goal of the Clean Air Act … [is] clean air").

Like EPA's actions in those cases, the Proposal here is unlawful, arbitrary, and capricious because it effectively reads the mandate to consider and decrease pollution and harm to human health and welfare out of the statute. As detailed below, EPA trivializes the amount of additional

criteria pollutants and air toxics the Proposal would create, calling them, erroneously and without context, "very small," 91 Fed. Reg. at 28,473. It refuses to model the added pollutants' air quality impact because the Agency claims that doing so is "extremely difficult" since the "atmospheric chemistry" is "very complex," 91 Fed. Reg.at 28,478—even though EPA conducted such analysis as part of the record supporting the 2024 Rule (and thus, no deference can be due as EPA here used no scientific and technical expertise). And the Agency deliberately "refrain[s]" from monetizing the Proposal's health and welfare harms because of alleged uncertainties, 91 Fed. Reg. at 28,478, even as is monetizes its alleged benefits. EPA's discretion does not extend to overlooking Congress' primary aim, and EPA's failure to consider this "important aspect" of the issue before it, *Center for Biological Diversity v. Nat'l Highway Traffic Safety Admin.,* 538 F3d 1172, 1193 (9th Cir. 2008), is arbitrary and capricious.

b. The Proposal Is Unreasonable Because It Will Cause Increased Pollution and Significant Health Harms, and EPA Underestimated Those Impacts.

As noted above, the Tier 4 Standards will reduce hundreds of thousands of tons of harmful pollutants from our air over the next few decades, saving the nation tens of billions of dollars. EPA's proposal includes an estimate of the emission increases due to the rollback of MY 2027-28 Tier 4 standards but fails to include estimates of the health impacts of such a rollback. We found evidence that EPA's Motor Vehicle Emission Simulator (MOVES5) model underestimated the impact of the Tier 4 Standards on emissions, which led the Agency to also underestimate the impact of the Proposal.

To fully understand the impact of the Proposal, EDF developed independent estimates of the benefits of the Tier 4 Standards using EPA's MOVES5.R3 model and then used those numbers to calculate more accurate estimates of the Proposal's impacts on NOx, VOC, and PM emissions. EDF also calculated the resulting health impacts of the Proposal using EPA's COBRA model. Additionally, EDF projected the emissions and health impacts of a full repeal (*i.e.,* beginning in MY 2027 and continuing indefinitely) of the Tier 4 Standards. We summarize EDF's results below and provide the full methodology and results in Appendix 1.

In the Proposal, EPA assumes that all manufacturers will comply with the Tier 4 NMOG+NOx standards on the default compliance schedule. For light-duty vehicles (LDVs) and light light-duty trucks (LDTs) the default compliance schedules phase-in emissions requirements between 2027 and 2030. For heavy LDTs and medium-duty vehicles (MDVs) the default compliance schedule is not a phase-in of standards but a full emissions standard requirement by 2031. EDF's analysis calls this the "EPA default scenario." EDF recalculated the impact of this scenario based on updated inputs to the MOVES5.R3 model. This is called the "EDF default scenario." In the Proposal, EPA did not run a sensitivity analysis that reflects the possibility that manufacturers of heavy LDTs and MDVs will opt to comply on the "early option" compliance schedule EPA offered in the 2024 Rule, which allows them to phase in beginning in MY 2027 and to complete the phase-in by MY 2032 and 2031, respectively. Such a choice could result in emissions reductions earlier in the program. Therefore, EDF developed a third scenario called the "EDF Early Action Sensitivity" that estimates the impacts of the Proposal and a full repeal on emissions, assuming all heavy LDT and MDV manufacturers choose EPA's early compliance path. This scenario represents a probable upper bound of emissions increases as it is unlikely that

all OEMs would choose the "early option." The "EDF default scenario" likely represents a lower bound, with actual emissions increases somewhere in between. EDF also projected the emissions impacts of a full repeal of the Tier 4 Standards. EDF assumed emissions from the MY 2027 and later model year vehicle fleet to be the same as those from MY 2026 vehicles to model Tier 3 emissions.

Table 1 below shows the Proposal's cumulative increase in NOx and VOC emissions through 2055, comparing EPA's and EDF's calculations. It also shows the impact of a full repeal of the Tier 4 standards as estimated by EDF. As shown, EDF's estimated default scenario NOx emissions increases through 2055 are roughly one-third higher than EPA's estimates, and EDF's estimated VOC emissions increases are more than one-and-a-half times that of EPA's estimates. When accounting for the early option compliance sensitivity, which includes an impact on MDV emissions, EDF's estimates for both NOx and VOC emissions increases through 2055 are more than 2.5 times EPA's, highlighting EPA's underestimation of the impact of the Proposal on our nation's air.

Table 1: Cumulative Emission Impacts of the Proposal and a Full Repeal of the Tier 4 NMOG+NOx Standards, 2027-2055 (U.S. tons)

	NOx			VOC		
	EPA	EDF		EPA	EDF	
	Default	Default	Early Option	Default	Default	Early Option
Proposal – LDVs / LDTs	18,551	25,214	34,711	15,991	25,765	35,526
Proposal - MDVs			12,344			6,506
Proposal – Total	**18,551**	**25,214**	**47,055**	**15,991**	**25,765**	**42,032**
Full repeal – LDVs / LDTs		689,546			706,856	
Full repeal - MDVs		352,228			207,917	
Full Repeal - Total		**1,041,774**			**914,773**	

Table 1 also shows the estimated impact of a full repeal of the Tier 4 NMOG+NOx emissions standards. Based on EDF's analysis, if EPA fully eliminates the Tier 4 standards, light- and medium-duty vehicles could emit an additional 1 million tons of NOx pollution and more than 900,000 more tons of VOC pollution by 2055.

EDF projected the health impacts due to the increased NOx and VOC emissions associated with the Proposal using EPA's COBRA model. EDF ran COBRA for calendar years 2025-2050 at five-year intervals and a 2% annual discount rate using input files developed by EPA.[65] EDF estimated the PM and ozone health impacts from NOx and VOC.

Table 2 shows the cumulative health impacts of the Proposal and a full repeal of the Tier 4 NMOG+NOx Standards through 2055. Using EPA's own emission impact assumptions, EDF estimates that by 2055, the proposed weakening of NMOG+NOx standards could result in 102-129 more premature deaths and cost the nation an additional $2.1 to $2.5 billion in health harms. EDF's analysis of the default compliance scenario shows that the health costs of the Proposal could actually be as large as $3.5 billion by 2055, nearly $1 billion more than under the EPA default estimate. And premature deaths could reach 176 by 2055, nearly 50 deaths more than EPA's upper estimate for the same default scenario. Under the Early Option scenario modeled by EDF, which includes the emissions impact of MDVs, cumulative health costs could be as high as $6.4 billion by 2055—more than double the estimate under the EPA default scenario. And more than 270 people could die prematurely from PM- and ozone-related health harms—again, more than double the estimate under the EPA default scenario. EDF also estimated the health impacts of a full repeal of the NMOG+NOx standards. Under a full repeal, EDF estimates that between 5,200 and 6,600 people could die prematurely by 2055 and the health incidences could cost the nation as much as $141 billion.

Table 2: Cumulative Health Impacts of the Proposal and a Full Repeal of the Tier 4 NMOG+NOx Standards, 2027-2055 (million $2024 or incidence)

	Monetized Benefits ($ million)	Premature Mortality	ER and Hospital Visits	Asthma Symptoms	Lost School and Work Days
The Proposal					
EPA Default	$2,053 – $2,540	102 - 129	242	80,908	46,525
EDF Default	$2,812 – $3,474	140 - 176	333	111,607	64,202
EDF Early Option	$5,136 – $6,353	240 - 273	610	204,813	117,735
Full Repeal					
EDF Default	$114,953 - $141,198	5,284 – 6,610	12,321	4,042,929	2,340,371

EDF also evaluated the emissions impact of the Proposal and the impact of a full repeal of the Tier 4 PM standards. In general, this evaluation followed the same procedure described above for the NMOG+NOx standards. However, the Tier 4 PM standards apply to light- and

[65] *Available at* https://www.epa.gov/cobra/cobra-future-input-files.

medium-duty vehicles on a per vehicle basis, as opposed to the fleetwide nature of NMOG+NOx standards. BEVs can be used as part of the growing share of the fleet that must meet the Tier 4 PM standard during the phase-in (2027-2029) before all vehicles must meet the 0.5mg standard in 2030. MDVs have a slightly different schedule. But under the EPA default compliance schedule, the share of vehicles that must meet the Tier 4 standard only apply to LDVs and light LDTs. Under the early option compliance schedule, the percentages apply to LDVs and all LDTs. There is also an early option for MDVs with a different schedule. EDF developed estimates of the reduction in PM emissions under our own low and high BEV sales scenarios. Again, for a full explanation of the methodology and results, *see* Appendix 1.

As shown in Table 3, EPA estimates that the Proposal would result in a cumulative PM emissions increase of 3,295 tons by 2055. Depending on the level of BEV sales, EDF estimates that under the default scenario, PM emissions could actually increase by up to 3,700 tons by 2050. And under the early option compliance sensitivity, EDF estimates that PM could increase by more nearly 6,000 tons under low BEV sales conditions—substantially more than EPA's estimate. If the Tier 4 PM standards were fully repealed, PM emissions could increase by as much as 138,00 tons to 161,000 tons cumulatively by 2055, depending on the BEV sales.

Table 3: Cumulative Emission Impacts of the Proposal and a Full Repeal of the Tier 4 PM Standards, 2027-2055 (U.S. tons per year)

	EPA Default	EDF Default		EDF Early Option	
		Low BEV	High BEV	Low BEV	High BEV
Proposal - LDVs / LDTs	3,295	3,703	2,567	5,328	4,116
Proposal - MDVs				604	604
Proposal - Total	**3,295**	**3,703**	**2,567**	**5,932**	**4,720**
Full Repeal – LDVs / LDTs		140,606	118,353		
Full Repeal - MDVs		20,255	20,255		
Full Repeal - Total		**160,861**	**138,608**		

EDF used the same methodology described above for the Tier 4 NMOG+NOx standards to calculate the health impacts of both the Proposal and a full repeal of the Tier 4 PM standards. Our results in Table 4 show how EPA's underestimation of the emissions impacts of the Proposal result in a significant underestimation of the health impacts. Based on EPA's default

compliance scenario, the Proposed rollback of the PM standard would result in 89-181 premature deaths by 2055, costing the nation up to $3.4 billion. Under EDF's default scenario, premature deaths could be as high as 203 and health costs as high as $3.8 billion, depending on the BEV sales assumed. And if manufacturers opt for the early compliance scenario, including for MDVs, the estimates for premature deaths rise to over 300 and the national PM and ozone-related costs jump to as high as $6 billion, depending on BEV sales, by 2055. If EPA were to fully repeal the Tier 4 PM standards, our nation could experience between 3,600 and 8,200 premature deaths in total between 2027 and 2055. The costs associated with those deaths and other health harms, like added ER and hospital visits, asthma symptoms and lost school and workdays, could range between $72 billion and $165 billion by 2055.

Table 4: Cumulative Health Impacts of the Proposal and Full Repeal of the Tier 4 PM Standards, 2027-2055 (million $2024 or incidence)

	Monetized Benefits ($ million)	Premature Mortality	ER and Hospital Visits	Asthma Symptoms	Lost School and Work Days
Proposal					
EPA Default	$1,699 – $3,387	89 - 181	169	40,170	10,849
EDF Default – Low BEV	$1,909 – $3,806	101 - 203	190	45,130	12,189
EDF Default – High BEV	$1,324 – $2,640	70 - 142	132	31,386	8,478
EDF Early Option – Low BEV	$3,023 - $6,028	160 - 323	302	71,424	19,274
EDF Early Option – High BEV	$2,399 - $4,783	127 - 256	240	56,754	15,312
Full Repeal					
EDF Default – Low BEV	$84,199 - $164,518	4,129 – 8,183	7,586	1,735,807	475,848
EDF Default – High BEV	$72,405 - $141,555	3,558 – 7,055	6,541	1,498,267	410,403

Combined, the impact of the Proposal on NOx, VOC, and PM emissions and the related health harms is substantial. By 2055, total ozone- and PM-related health harms from the rollback of both the NMOG+NOx standards and the PM standards could cause 310 premature deaths by 2055 under EPA's default scenario and as many as 379 premature deaths under EDF's default scenario. These health harms could cost the nation a total of $6 billion cumulatively through 2055 assuming EPA's emissions increases or up to $7.2 billion assuming the higher emissions increases under the EDF default scenario. EDF estimates that a full repeal of the Tier standards

could result in 8,842 – 14,793 total premature deaths by 2055 with a cost of $187 - $305 billion cumulatively by 2055.

EPA's underestimation of these emission impacts and failure to consider the health and economic impacts associated with these emissions is arbitrary and capricious.

c. EPA's Failure to Monetize Health Impacts Is Arbitrary and Capricious and an Inadequately Explained Change in Position.

EPA asserts compliance cost reductions as a basis for the Proposal. *See* 91 Fed. Reg. at 28,476 tbl.11. But simultaneously, and in a break in practice from prior vehicle standards rulemakings spanning decades, EPA arbitrarily chose not to quantify or monetize the health harms that would occur under the Proposal. *Id.* at 28,478; DRIA at v. As detailed below, this choice was arbitrary and capricious and unlawful. Additionally, EPA's decision to jettison its rigorous, peer-reviewed methodology for quantifying health impacts is not adequately explained or justified and is likewise unlawful.

i. EPA's Failure to Analyze the Health Impacts Associated with Delaying Implementation of Tier 4 Standards is Unlawful and Arbitrary.

Section 202(a)(1) of the Clean Air Act authorizes EPA to promulgate standards applicable to motor vehicle emissions that, in the Administrator's judgment, cause or contribute to air pollution that "may reasonably be anticipated to endanger public health or welfare," 42 U.S.C. § 7521(a)(1); thus, protection of public health is the central purpose of Section 202(a). Yet EPA's analysis demonstrates that the Proposal would increase emissions of criteria pollutants, with elevated emission levels persisting through 2055—the expected operational lifetime of MY 2027 and MY 2028 vehicles. DRIA at iv–v, tbl.ES-2 (projecting increases in NOx, VOC, and PM2.5 emissions persisting through 2055). Although the Agency acknowledges that "the emissions changes ... would also be associated with impacts to air quality and human health," it fails to estimate or monetize the negative health impacts of the Proposal, instead irrationally declaring that "[t]he net benefits associated with this proposal are therefore the cost savings." *Id.* at v.

This assertion is wholly conclusory and contravenes the requirement of reasoned agency decisionmaking. Regulatory cost-benefit analysis under Executive Order 12866 requires that the Agency assess "all identifiable costs and benefits," including "direct effects as well as indirect benefits and costs," and that "the same standards of information and analysis quality that apply to direct benefits and costs ... be applied to ancillary benefits and countervailing risks."[66] Without a full quantification of both the costs and benefits of the Proposal and a reasoned comparison and weighing of the two estimates, EPA has not calculated net benefits; instead, it has only estimated compliance cost reductions while ignoring the foregone health benefits of the Tier 4 Standards

[66] Exec. Order No. 12,866, 58 Fed. Reg. 51,735 (Oct. 4, 1993); *see also* Off. of Mgmt. & Budget, Circular A-4: Regulatory Analysis 26 (2003) ("OMB Circular A-4"); EPA, *Guidelines for Preparing Economic Analyses* 5-2 & n.2, 11-2 (3d ed. 2024).

that will not accrue under the Proposal. EPA's selective and biased accounting is unreasoned and arbitrary.[67]

EPA may not exclusively account for the certain "benefits" of its Proposal while arbitrarily failing to estimate and monetize corresponding costs. *See, e.g.*, *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1200 (9th Cir. 2008) (agency "cannot put a thumb on the scale by undervaluing the benefits and overvaluing the costs of more stringent standards").[68] In the cost-benefit analysis for rescinding a regulation, the relevant comparison is the difference between the preexisting regulatory baseline, including the promulgated regulation, and the proposed change, or the repeal of the regulation. Therefore, the health benefits of the Tier 4 Standards are properly understood as foregone benefits under the Proposal, and EPA must quantify and weigh these foregone benefits as costs in assessing the Proposal's impacts.[69]

EPA's 2024 Rule RIA found that the health benefits of Tier 4 Standards clearly outweigh compliance costs, projecting present-value health benefits of $240 billion (2022$) against far smaller compliance costs. EPA, *Regulatory Impact Analysis for the Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium Duty Vehicles* 9-22 tbl.9-19 (2024), EPA-420-R-24-004 ("2024 Rule RIA"). The Agency's failure to engage in any comparable accounting of the costs and benefits of the Proposal is impermissible. By proposing regulatory action that concedes a definite increase in criteria pollutant emissions without quantifying or analyzing the associated negative health impacts, EPA failed to "articulate a satisfactory explanation" and set forth a "rational connection between the facts found and the choice made." *State Farm*, 463 U.S. at 43 (quoting *Burlington Truck Lines, Inc. v. United States*, 371 U.S. 156, 168 (1962)). Conclusively, EPA fails to account for the health impacts that Section 202(a) specifically directs it to consider in setting motor vehicle emission standards. *See* 42 U.S.C. § 7521(a)(1) (authorizing standards against emissions that "may reasonably be anticipated to endanger public health or welfare"); *Massachusetts*, 549 U.S. at 531–32 (the Clean Air Act was enacted "to protect and enhance the quality of the Nation's air resources so as to promote the public health").

[67] *See, e.g.*, OMB Circular A-4 at 19 (agencies "should not assume that the avoided costs of not doing another regulatory alternative represent the benefits of a regulatory action where there is no direct, necessary relationship between the two").

[68] *See also California v. Barnhardt*, 472 F. Supp. 3d 573, 612 (N.D. Cal. 2020) ("It is arbitrary for an agency to quantify an action's benefits while ignoring its costs where tools exist to calculate those costs."); *State of N.Y. v. Reilly*, 969 F.2d 1147, 1153 (D.C. Cir. 1992) (where EPA admitted that a previous proposal would provide air quality benefits, the Agency needed to address the foregone air quality benefits in declining to adopt the proposal); *Sierra Club v. Sigler*, 695 F.2d 957, 979 (5th Cir. 1983) (once an agency chooses to "trumpet the benefits" of its proposed action as a "selling point," it is required to provide "full disclosure and analysis of the[] costs.").

[69] *See* OMB Circular A-4 at 19 ("To the extent possible, [the agency] should monetize any ... forgone benefits and add them to the other costs of that alternative.").

ii. EPA's Stated Basis for Refusing to Quantify Health Impacts Is Insufficient.

EPA has estimated and monetized the public health benefits of its light-duty motor-vehicle emission standards for decades.[70] In the 2024 Rule that EPA now proposes to partially rollback, for instance, EPA quantified the present value of its Tier 4 criteria pollutant standards' health benefits as $240 billion ($2022), under a 2% discount rate. 2024 Rule RIA at 9-22 tbl.9-19. Despite EPA's long history of quantifying and monetizing public health benefits, the Proposal abruptly abandons this practice, failing to evaluate or even acknowledge the foregone health benefits of weakening the Tier 4 Standards. By refusing to quantify, monetize, and weigh the health benefits associated with the Proposal's laxer standards, EPA arbitrarily disregards decades of guidance from experts, its own formal economic analysis guidelines, and a large and longstanding body of empirical evidence documenting the strong relationship between pollution exposure, morbidity, and mortality.[71] EPA's abandonment of its established practice—and the failure to consider health impacts in regulatory decisionmaking—runs afoul of substantive and procedural statutory requirements, and the Agency's failure to explain this stark change in policy renders the Proposal arbitrary and capricious. *See Fox Television*, 556 U.S. at 515 (when an agency chooses to depart from a prior position, it must "provide reasoned explanation for its action . . . display[ing] awareness that it *is* changing position" and "show that there are good reasons for the new policy"); *Encino Motorcars*, 579 U.S. at 222 ("[A]n 'unexplained inconsistency' in agency policy is 'a reason for holding an interpretation to be an arbitrary and capricious change from agency practice.'" (citation omitted)).

EPA asserts four reasons in support of its decision not to quantify health impacts in the Proposal: (1) the six assumptions enumerated by OMB in a 2017 report as sources of uncertainty in PM health benefit estimation; (2) the EPA Science Advisory Board's (SAB) 2024 review of EPA's method for estimating health effects of PM2.5, which identified areas warranting improvement in uncertainty characterization; (3) the Agency's purported interest in reevaluating whether health benefits at concentrations below the NAAQS should be counted; and (4) structural limitations of benefit-per-ton valuation approaches. DRIA at 2-10 to 2-11. None of these justifications is sufficient to support EPA's failure to quantify health impacts here.

Foremost, EPA's existing methods rigorously account for uncertainty and, if anything, underestimate the true health benefits from emission reductions. EPA's own SAB recently affirmed those tools as "essential tools in estimating the scale of health benefits," described them as "scientifically robust," and found EPA's three-tiered uncertainty approach to be "fundamentally a sensible one."[72] The SAB's recommendations were forward-looking

[70] *See* 56 Fed. Reg. 25,724, 25,737 (June 5, 1991) (quantifying the substantial hydrocarbon, carbon monoxide, and NOx emission reductions from the Tier 1 standards); 65 Fed. Reg. 6698, 6787 (Feb. 10, 2000) (estimating the monetized health benefits of the Tier 2 Standards at approximately $25.2 billion ($1997) under a 5% discount rate); 79 Fed. Reg. 23,414, 23,426 (Apr. 28, 2014) (estimating monetized health benefits for the Tier 3 Standards between $7.4 billion and $19 billion ($2011) under a 3% discount rate).

[71] *See* OMB Circular A-4 at 26-27, 40-41; EPA, *Guidelines for Preparing Economic Analyses, supra*, at 5-2 & n.2, 11-2, 11-4.

[72] EPA Sci. Advisory Bd., *Transmittal of the Science Advisory Board Report, Review of BenMAP and Benefits Methods* 37 (Jan. 17, 2024). https://www.regulations.gov/document/EPA-HQ-OAR-2025-3297-0047

refinements, not a repudiation, and where the SAB identified methodological gaps, those gaps likely contribute to an undervaluation of health harms.[73] EPA's invocation of the SAB review to justify its refusal to quantify health impacts misrepresents the SAB's conclusions. Even if the estimation of impacts were truly uncertain, governing guidance instructs that those impacts should "not be excluded from a regulatory analysis."[74] An agency may not omit consideration of an entire category of regulatory impacts simply because quantification is difficult or somewhat uncertain. *See, e.g.*, *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1200 (9th Cir. 2008) (EPA's failure to monetize the benefit of emission reductions due to purported uncertainty was arbitrary and capricious because "while the record shows a range of values, the value of carbon emission reductions is certainly not zero").[75]

In the Proposal, EPA does not simply refuse to estimate the health benefits from the Tier 4 Standards; rather, the Agency affirmatively and arbitrarily estimates that these benefits are equal to zero. To the extent that EPA believes there is uncertainty in the estimation of health benefits from the Tier 4 Standards, it is abundantly evident that the benefits are not zero. The foregone health benefits flowing from EPA's Proposal are clearly non-zero and are indeed substantial. EPA's own analysis projects that the Proposal would increase criteria pollutant emissions through at least 2055. DRIA at iv–v, tbl.ES-2. The health consequences of those increases are among the best-documented relationships in public health: criteria pollutant exposure causes premature mortality, cardiovascular and respiratory disease, lung cancer, and neurodegeneration, among other serious harms. *Id.* at 2-6 to 2-14. EPA's own benefit-per-ton estimates—the same peer-reviewed estimates it now refuses to apply—assign monetized values well above zero to these harms across every sector and region.[76] Even conservative benefit-per-ton values applied to EPA's own projected emissions increases would produce health disbenefits exceeding the $1.77 billion in cost savings that form the entire basis for EPA's claimed "net benefits."[77] EPA presents no evidence to suggest that the health benefits associated with the Tier 4 Standards are equal to zero, or that there are negative impacts associated with the standards that would come close to cancelling out the standard's positive health impacts.

EPA's choice to abandon its established practice of quantifying human health impacts is arbitrary and runs afoul of substantive and procedural requirements of the Clean Air Act. EPA never explains why its generalized concerns justify wholly rejecting these estimates. In particular, EPA never articulates why it declines to adopt recommendations from expert reviewers and declines to refine its estimates and their presentation, rather than rejecting them

[73] *See id.* at 20-28 (identifying underestimated impacts of cardiac arrest, stroke, lung cancer, and neurodegenerative disease).

[74] OMB Circular A-4 at 40.

[75] *See also Pub. Citizen v. Fed. Motor Carrier Safety Admin.*, 374 F.3d 1209, 1218-19 (D.C. Cir. 2004) ("The mere fact that the magnitude of [the] effects is *uncertain* is no justification for *disregarding* the effect entirely."); *Corrosion Proof Fittings v. EPA*, 947 F.2d 1201, 1219 (5th Cir. 1991) (EPA's failure to quantify health impacts due to purported uncertainty was impermissible because unquantified impacts "never were intended as a trump card allowing EPA to justify any cost calculus, no matter how high.").

[76] *See* EPA, *Technical Support Document: Estimating the Benefit Per Ton of Reducing Directly-Emitted PM 2.5, PM 2.5 Precursors and Ozone Precursors From 21 Sectors* at 20 (2023).

[77] *See id.* at 22-29; DRIA at iv.

wholesale. 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. Finally, 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's decision to weaken the Tier 4 Standards while simultaneously abandoning its decades-long practice of quantifying and monetizing the associated health impacts is arbitrary and capricious. The Agency has presented compliance cost reductions as the total of the Proposal's "net benefits," while deliberately ignoring that the health disbenefits of increased criteria pollutant exposure are well-documented and non-zero. *See State Farm*, 463 U.S. at 43 (an agency rule is arbitrary where it "entirely fail[s] to consider an important aspect of the problem"). An agency that proposes to weaken health-protective standards must grapple honestly and thoroughly with the public health consequences of that choice. EPA has not done so here.

2. EPA's Proposal Is Unreasonable and Arbitrary Because the Tier 4 Standards Remain Technologically Feasible and Provide Ample Lead Time.

Under Clean Air Act Section 202(a)(2), 42 U.S.C. § 7521(a)(2), EPA is required to consider technological feasibility and lead time when promulgating or revising motor vehicle emission standards. Specifically, the statute requires that standards "shall take effect after such period as the Administrator finds necessary to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period." The D.C. Circuit has recognized that EPA's standard-setting under Section 202(a) involves a "necessarily predictive judgment" regarding the availability of pollution control technologies. *NRDC v. EPA*, 655 F.2d 318, 336 (D.C. Cir. 1981). The Agency need not guarantee certainty of compliance; it must only "identify the major steps necessary for development of the device, and give plausible reasons for its belief that the industry will be able to solve those problems in the time remaining." *Id.* at 333. The court articulated this standard based on a record where the technology at issue had not yet been demonstrated, *id.*; *see also International Harvester Co. v. Ruckelshaus*, 478 F.2d 615, 629 (D.C. Cir. 1973) (upholding EPA's authority to set standards predicated on technologies not yet commercially proven, observing that Congress intended the Clean Air Act to be "technology forcing" and that EPA's predictive judgments about future technological developments were entitled to deference)—a far more demanding posture than the one presented here, where EPA itself had found that all requisite technologies are *already developed and in production*. *See, e.g.*, DRIA at 1-3 ("The emissions control technologies considered in this proposal for MYs 2027 and 2028 are already in volume production, therefore the Agency has not performed a detailed feasibility assessment of these technologies.").

If technology-forcing standards premised on unproven technology can satisfy Section 202(a)'s feasibility requirement, then standards premised on technology already in mass production satisfy it. And nothing has occurred since April 2024, when the Tier 4 Rule was finalized, that has altered the underlying technological feasibility of meeting the Tier 4 Standards on the original timeline. When revising a rule, EPA must examine the relevant data and articulate a satisfactory explanation for its action, including a rational connection between the facts found and the choice made. *State Farm*, 463 U.S. at 43. And when a new policy rests on factual

findings that contradict those underlying its prior policy, the Agency must provide a more detailed justification. *Fox Television*, 556 U.S. at 515-16. Here, however, EPA has provided no support—neither new analysis nor information from its past analyses—to support the Agency's contention that the Tier 4 Standards are no longer feasible. EPA simply asserts that an alleged change in expectations regarding BEV penetration rates means that additional lead time is needed. The Agency previously found that the Tier 4 Standards were feasible at BEV penetration rates lower than those estimated in the Proposal, *see* 89 Fed. Reg. at 28,082-28,084 (assuming fixed 5% BEV penetration) and has conducted no new analysis of available technologies, their ability to meet the standards, or the actual lead time needed. EPA's attempt to justify the Tier 4 weakening based on lead time concerns, therefore, is arbitrary and capricious.

a. EPA's 2024 Feasibility Determination Remains Unrebutted.

When EPA promulgated the Tier 4 Standards in April 2024, the Agency conducted an extensive feasibility analysis spanning hundreds of pages in the Regulatory Impact Analysis and preamble. EPA's conclusions were unequivocal. The Agency found that "the final standards are technologically feasible and that the costs of compliance for manufacturers will be reasonable." 89 Fed. Reg. at 27,845. EPA explained that "[t]he technological readiness of the auto industry to meet final standards for model years 2027-2032 is best understood in the context of over a decade of light-duty vehicle emissions reduction programs in which the auto industry has introduced emissions-reducing technologies in a wide lineup of ever more cost-effective, efficient, and high-volume vehicle applications." 89 Fed. Reg. at 28,086.

These findings were made after notice-and-comment rulemaking in which EPA received and responded to extensive comments from automakers, suppliers, organizations, and the public. The Agency considered and rejected industry arguments for less stringent standards, including arguments about the pace of technology deployment and cost of compliance. *See, e.g.*, 89 Fed. Reg. at 27,930-31 (responding to manufacturer concerns about phase-in timing); *id.* at 27,941 (responding to manufacturer concerns about technology integration). The 2024 feasibility determination was the product of years of technical analysis, stakeholder engagement, and expert judgment. Nothing in the current Proposal identifies any error in that analysis or any new information that would undermine its conclusions with respect to the Tier 4 Standards.

EPA's Proposal does not seriously dispute that the Tier 4 Standards for MYs 2027 and 2028 remain technologically feasible. The Proposal does not revisit, and does not purport to overrule, its 2024 feasibility findings. The Agency's DRIA is conclusive, conceding that the delay is "not due to concerns with the ability of technologies to achieve the MY 2027 and 2028 Tier 4 Standards given sufficient lead time." DRIA at 1-3. The Proposal identifies no technological barrier to compliance, and the feasibility of the Tier 4 Standards is established beyond any reasonable dispute by EPA's own record (both the 2024 Rule and the Proposal), the certification data, and the applicable legal standards. EPA makes a series of admissions that individually and collectively establish feasibility beyond dispute. *See, e.g.*, DRIA at 1-3 ("[T]he EPA is proposing to extend the Tier 3 program and delay the start of the Tier 4 program for two MYs due to concerns with lead time for vehicle development, not due to concerns with the ability of technologies to achieve the MY 2027 and 2028 Tier 4 Standards given sufficient lead time."); *id.* ("[T]he emissions control technologies considered in this proposal for MYs 2027 and

2028 are already in volume production, therefore the Agency has not performed a detailed feasibility assessment of these technologies."); *id.* ("The EPA is aware that some manufacturers have already certified some vehicle models to the final Tier 4 Standards for MY 2027."); *id.* at 1-4 (assuming that "a likely pathway for Tier 4 NMOG+NOx emissions compliance will be adding catalyst content to the [three-way catalysts] on gasoline-fueled light-duty program vehicles," and describing this as "straightforward to assess from a cost perspective, since it relies upon adjusting the variable hardware cost associated with the [three-way catalyst] catalyst loading."); *see also* 91 Fed. Reg. at 28,473 (noting that "some companies have certified Tier 4 vehicles for MY 2027").

b. EPA's Claims Regarding a Need for Additional Lead Time Are Arbitrary and Unreasonable.

Under Clean Air Act Section 202(a)(2), 42 U.S.C. § 7521(a)(2), EPA must allow sufficient lead time when promulgating or revising motor vehicle emission standards. EPA proposed a two-year weakening of the Tier 4 Standards ostensibly to provide additional lead time the Proposal claims manufacturers need. *See* 91 Fed. Reg. at 28,466, 28,470-73. The 2024 Rule itself, however, provided ample time for compliance, as demonstrated by that rule's record. *See* 89 Fed. Reg. 28,086-91. As explained above, EPA expressly found that the Tier 4 Standards are "technologically feasible" and that the "costs of compliance for manufacturers will be reasonable." *Id.* at 27,845. The underlying technology necessary for compliance is already developed, demonstrated, in production, and installed on many vehicles on the road, and manufacturers have obviously had ample time to apply it. EPA's objections to lead time now relate exclusively to purported changes in planned production of BEVs, *see* 91 Fed. Reg. at 28,470-73, but, in the Tier 4 rulemaking, EPA found that the NMOG+NOx and PM standards could be achieved with ICE vehicle technology alone. And EPA specifically found that no BEV production beyond the levels already achieved was necessary to meet the standards, *see* 89 Fed. Reg. at 27,845 ("[I]t would be technologically feasible to meet these standards without additional zero-emission vehicles beyond the volumes already sold today."). Nothing has occurred since April 2024, when the Tier 4 Rule was finalized, that has altered the feasibility of compliance with the Tier 4 emission standards on the original timeline. EPA's attempt to justify the Tier 4 weakening based on lead time concerns, therefore, is arbitrary and capricious.

c. The Feasibility of the Tier 4 Standards Was Independently Justified Based on ICE Technology Alone, and Adequate Time Exists to Apply This Technology.

EPA's Proposal rests primarily on the assertion that changes in the BEV landscape make achieving MY 2027 and 2028 Tier 4 Standards infeasible on their original timeline. 91 Fed. Reg. at 28,470-73. Specifically, EPA contends that the June 2025 Congressional Review Act ("CRA") resolution regarding California's Advanced Clean Cars II ("ACC II") waiver, and the July 2025 One Big Beautiful Bill Act ("OBBB Act"), created a "vastly different compliance landscape wherein [manufacturers] need to rely on emission reductions from non-BEV vehicles, rather than increased BEV sales," 91 Fed. Reg. at 28,467, prompting the need for additional lead time. California's ACC II program would have phased out sales of new internal combustion engine vehicles in California by 2035. *Id.* at 28,466; *see also* Public Law 119-16, 139 Stat. 66 (June 12, 2025). The OBBB Act ended certain tax credits for purchasing BEVs earlier than originally scheduled. 91 Fed. Reg. at 28,466-67; *see also* Public Law 119-21, 139 Stat. 72 (July 4, 2025).

EPA claims that the CRA disapproval of the ACC II waiver and the OBBB Act's elimination of certain BEV tax credits disrupted manufacturers' compliance strategies, resulting in the need for additional lead time. *Id.* at 28,466-67, 28,470-73.

EPA's position is unsupported by the facts, including any critical evaluation of vehicle sales data. To begin, the Tier 4 Standards never required compliance through BEV technology. Manufacturers had an array of options available for compliance, and EPA expressly found that the standards could be met by installing improved emission controls on ICE vehicles and producing no additional BEVs. *See, e.g.*, 89 Fed. Reg. at 27,845 ("[I]t would be technologically feasible to meet these standards without additional zero-emission vehicles beyond the volumes already sold today."); *id.* at 27,897 (standards "can also be met solely with vehicles containing internal combustion engines"). This is true for both the NMOG+NOx and PM standards. *See id.* at 27,932 (The final NMOG+NOx standards "could be met by producing…no BEVs and solely ICE-based vehicles with improved emissions controls relative to what was required by final Tier 3"); *id.* at 28,088 ("[A] manufacturer could meet the PM standard solely through adding gasoline particulate filters to ICE vehicles"); *id.* at 28,096 n.1351 ("[T]he PM standards can be met entirely through the adoption of gasoline particulate filters, regardless of the level of electrification," and "the NMOG+NOx standards can be met entirely through increases in ICE technologies relating to engine and aftertreatment improvements").

EPA's 2024 Rule further reinforced this conclusion by modeling multiple sensitivity analyses, each representing a different potential future for BEV adoption, and concluding the standards remained feasible under every scenario, *see* 89 Fed. Reg. at 28,068, including:

- Under the "Slower BEV Acceptance" sensitivity, EPA found compliance feasible. *Id.* at 28,073.
- Under the "No Credit Trading" sensitivity—eliminating a key compliance flexibility—EPA still found the standards feasible. *Id.* at 28,074.
- Under the "No Additional BEVs Beyond the No Action Case" sensitivity—where manufacturers choose to limit BEV production to the trajectory observed in the Central No Action case—EPA found compliance feasible. 89 Fed. Reg. at 28,076 & 28,077 tbls. 163-169.
- Even under the "No New BEVs Above Base Year Fleet" illustrative scenario, in which the OMEGA model was restricted from redesigning any vehicle as a new BEV, holding light-duty BEV levels at 5% (significantly lower than *current* market penetration and the Proposal's BEV projections), EPA found compliance feasible. *Id.* at 28,082-84.

EPA concluded that, "[o]verall, the sensitivity analyses demonstrate that the final standards are achievable under a wide range of differing assumptions and lend additional support for the feasibility of the final standards, considering costs and lead time." 89 Fed. Reg. at 27,897. Having initially found the criteria pollutant standards feasible with the lead time provided at an array of BEV penetration levels, the Agency cannot now simply claim that circumstances have rendered the standards infeasible or that lead time is insufficient when it previously evaluated even more adverse circumstances and reached the opposite conclusion. *See Fox Television*, 556 U.S. at 515-16.

Indeed, numerous feasible vehicle emission control technologies that already exist and are in widespread use in ICE vehicles today supported EPA's reasoning in the Tier 4 Rule and continue to support the feasibility of the original timeline. As EPA explained, "[i]n this [Tier 4] rulemaking, unlike some prior vehicle emissions standards (including those adopted in the Clean Air Act of 1970), the technology necessary to achieve significantly more stringent standards has already been developed and demonstrated in production vehicles." 89 Fed. Reg. at 28,086; *see also id.* ("Manufacturers have also demonstrated impressive gains in controlling NMOG+NOx and PM from vehicles with internal combustion engines."). The Manufacturers of Emission Controls Association (MECA) also emphasized that the Tier 4 Standards are feasible through multiple compliance pathways and technologies.[78] EPA's DRIA for the Proposal concedes that there are no "concerns with the ability of technologies to achieve the MY 2027 and 2028 Tier 4 standards" aside from the Agency's newfound lead time concerns. *See* DRIA at 1-3.

The primary technology EPA has identified for NMOG+NOx compliance in ICE vehicles is improved precious metal loading in three-way catalytic converters—an incremental change to a technology that has been used in the industry for at least 45 years. *See* DRIA at 1-3 to 1-7; *id.* at 1-4 ("The application and steady improvement of [three way catalysts] for light-duty program vehicles has been the most common approach to reducing NMOG and NOx emissions from gasoline vehicles for nearly 50 years."); 2024 Rule RIA at 3-56 to 3-61.[79] This technology is already being applied by manufacturers, with vehicles far outperforming the Tier 3 NMOG+NOx requirements as of 2024: "Many vehicles are already demonstrating emissions performance at one-third to one half of the Tier 3 NMOG+NOx final fleet average of 30 mg/mile through optimized engine and aftertreatment design and controls." 89 Fed. Reg. at 28,086. The DRIA confirms that compliance with the Tier 4 MY 2027 and MY 2028 NMOG+NOx standards requires nothing more than incremental adjustments to precious metal loadings in existing three-way catalytic converter formulations—for example, adding approximately 0.98 grams of palladium per vehicle in MY 2027 and 1.43 grams in MY 2028. DRIA at 1-5 to 1-6. And the costs of this compliance pathway are modest. Under the Proposal, manufacturers will experience per-vehicle catalyst cost savings of only, on average, $35 to $95 per vehicle (undiscounted), accounting for the difference between Tier 3 and Tier 4 NMOG+NOx compliance. *See* DRIA at tbl.1-3.

Moreover, EPA certification data from MYs 2025 through 2026 establish that a significant number of current internal combustion engine vehicles already meet or exceed the MY2027 and 2028 Tier 4 NMOG+NOx standards without any modification.[80] EPA found in the 2024 Rule that "more than 20 percent of MY 2021 Bin 30 vehicle certifications already had an FTP certification value under 15 mg/mile NMOG+NOx," supporting the standards'

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[78] Michael Geller & Kevin Brown, MECA, *Tier 4 Standards Are Feasible and Complement EPA's AQ Goals* (Feb. 24, 2026), https://www.4cleanair.org/wp-content/uploads/MECA-NACAA_MSF-02242026.pdf.

[79] *See also* EPA, *Timeline of Major Accomplishments in Transportation, Air Pollution, and Climate Change*, https://www.epa.gov/transportation-air-pollution-and-climate-change/timeline-major-accomplishments-transportation-air (noting that, in 1981, "[s]ophisticated three-way catalysts with on-board computers and oxygen sensors appear in most new cars, helping to optimize the efficiency of the catalytic converter").

[80] *See* Environmental Defense Fund, *Coming Soon: Trump EPA Expected to Delay "Tier 4" Air Pollution Standards for Cars and Trucks* (May 13, 2026), https://www.edf.org/media/coming-soon-trump-epa-expected-delay-tier-4-air-pollution-standards-cars-and-trucks.

reasonableness. 89 Fed. Reg. at 27,936. The Tier 4 Standards do not require the fleet to meet an average of 15 mg/mile—the level that some vehicles were already certifying at in MY 2021—until MY 2032. *Id.* at 27,935 tbl.39. The MY 2027 standard that EPA now claims requires additional lead time is only a fleet average of 25 mg/mile—far less demanding. *Id.* The 2024 Rule RIA identified 39 MY 2023 vehicle models with ICE NMOG+NOx emissions certified below 15 mg/mile on the FTP, four models at or below 10 mg/mile, and an additional 60 models certified between 15 and 20 mg/mile. 2024 Rule RIA at 3-53. If a substantial share of vehicles in the current fleet already meet the more stringent MY 2032 standard, the notion that manufacturers cannot meet the far more lenient MY 2027 and 2028 fleet average standards is not credible, and EPA's Proposal provides nothing to support such a claim.

EPA not only fails to provide any new analysis contradicting its earlier NMOG+NOx feasibility assessments based on three-way catalyst loading but also entirely fails to consider the multiple ICE-based compliance technologies beyond catalyst loading that the 2024 Rule RIA identified as feasible technologies to meet the Tier 4 Standards. EPA's 2024 Rule RIA provided a suite of already-existing ICE-based NMOG+NOx control technologies that manufacturers can use individually or in combination. *See, e.g.*, 2024 Rule RIA at 3-56 ("Multiple technologies and control strategies are available to reduce tailpipe emissions from ICE."). In addition to catalyst loading, EPA discussed numerous technology options, including: aftertreatment hardware changes (such as lower-mass catalysts, higher-surface-area catalysts, advanced washcoat and platinum group metal technology, hydrocarbon traps, NOx adsorbers, and catalyzed filters), 2024 Rule RIA at 3-56 to 3-58; engine operation strategies (such as changes in valve timing during cold start, negative valve overlap, early exhaust valve closing, early exhaust valve opening, spark timing, injection timing, higher cranking speeds in hybrid powertrains, and cylinder deactivation strategies that enable faster catalyst heating), 2024 Rule RIA at 3-58 to 3-60; and active catalyst heating (including electrically heated catalysts, electrically heated catalysts in hybrid electric vehicles (HEVs) and plug-in hybrid electric vehicles (PHEVs), and exhaust burners), *id.* at 3-60 to 3-61. EPA emphasized that these technologies can be layered. *Id.* at 3-62 to 3-63 ("[O]ptimum emissions reduction benefits may be obtained by combining more than one strategy" and "multiple strategies can react synergistically to produce greater benefits"). EPA cited examples from FEV Engine Technologies and manufacturers such as Hyundai and Toyota, showing very low NMOG+NOx levels through combinations of aftertreatment, catalyst heating, NOx traps, HC traps, engine timing, PHEV operation, and motored starts. *Id.* at 3-62 to 3-63. EPA has provided no reasoned, technology-specific analysis of whether ICE-based compliance remains feasible using the available suite of technologies. The Agency cannot justify weakening the standards merely by pointing to changed BEV projections if it does not analyze available ICE compliance pathways, especially when its prior conclusions contradict its new position. *See State Farm* 463 U.S. at 43; *Fox*, 556 U.S. at 515-16.

Nor did EPA address the role that significantly higher sales of HEVs compared to those assumed in the 2024 Rule may play in enabling manufacturers to meet the Tier 4 Standards on schedule, despite acknowledging that numerous manufacturers are expanding (and plan to continue expanding) their hybrid offerings. 91 Fed. Reg. at 28,471. The 2024 Rule's central case assumed 4% HEV sales in 2027 and 5% HEV sales in 2028, and even the "higher HEV and PHEV pathway" assumed 4% HEV sales in 2027 and 15% HEV sales in 2028. 89 Fed. Reg. at

27,856, tbl.3. Yet, in actuality, May 2026 HEV sales were 16.3%, well above those assumptions.[81]

This high penetration of HEVs should make compliance with the 2024 Rule cheaper and easier for a variety of reasons: Strong hybrids can shut the engine off during low-load operation, the engine can operate in a narrower range because the electric assist provides extra power when needed for acceleration, engine speed can be increased at start-up, and the engine itself can be downsized while achieving the same performance, all of which reduce engine out emissions.[82] The lower level of engine out emissions from hybrids means that they can be certified to existing low emission bins more easily and cheaply than conventional vehicles. Moreover, the higher voltage batteries used by hybrids are well suited to support electrically heated catalysts, and HEVs can be driven exclusively with the electric motor at the beginning of the cycle, both of which help to further reduce emissions. *See* 2024 Rule RIA at 3-60 to 3-61. For all of these reasons, it is unsurprising that available data shows HEVs generally meet more stringent bins. The 2024 Rule RIA showed that the Model Year 2023 NMOG + NOx certification values for strong hybrids and PHEVs were systematically lower than the values for conventional ICEs and mild hybrids. 2024 Rule RIA at 3-62, fig. 3-19. For Model Years 2025 and 2026, 94 of the 232 models certified to Bin 30 and 20 were hybrids.[83] EPA cannot point to slackening BEV projections to justify weakening the standards while ignoring record HEV sales and the ways those vehicles can enable manufacturers to meet the standards, particularly given its prior findings regarding the potential role of HEVs in compliance.

Furthermore, EPA presents no evidence that the 2024 Rule's NMOG+NOx test protocols are infeasible. To the contrary, EPA's 2024 analysis—and available evidence from more recent model years—indicates that the testing protocol should not pose a barrier for manufacturers. The primary difference between Tier 3 and Tier 4 testing protocols is the elimination of the SFTP composite score, in which the weighted average test scores across FTP, US06, and SC03 tests must meet the bin certification level; instead, under Tier 4, all three tests must certify at the bin level. The 2024 Rule found that this was feasible; as the 2024 Rule RIA explained, for "most of the" Model Year 2023 vehicles it analyzed, "the FTP results are higher than the HWFE, SC03 and US06 test results showing that a single standard is feasible and already being met by some manufacturers." 2024 Rule RIA at 3-64. Indeed, more recent data shows that the vast majority of vehicles certified to a particular Tier 3 bin would have met all tests required by Tier 4: ERM used light- and medium-duty vehicle certification data to identify any models certified under the Tier 3 protocol that would fail the more stringent NMOG+NOx Tier 4 protocol, and out of around 3,500 tests, only 50 individual tests failures were recorded for Model Years 2025 and 2026.[84]

For PM, EPA identifies the gasoline particulate filter ("GPF")—another existing, in-use emission control technology—as a key technology available to satisfy Tier 4 compliance

[81] JD Power, Press Release, *May SAAR to Reach 16.3 million as Retail Sales Rise 6.0%, Reversing 7-Month Trend* (May 21, 2026), https://www.jdpower.com/business/press-releases/jd-power-globaldata-forecast-may-2026.

[82] *See also* Geller & Brown, *supra*, at 16 (demonstrating lower emissions for hybrids versus pure ICE vehicles).

[83] Geller & Brown, *supra*, at 21.

[84] *See* ERM, Tab 3-Calculation EPA testing procedure analysis (attached as Exhibit).

requirements in ICE vehicles. 91 Fed. Reg. at 28,472. EPA found in 2024 that GPF technology is "both mature and cost effective," documenting its use globally in series production since 2017. 89 Fed. Reg. at 27,944. An estimated 100 million GPFs have been installed in light-duty vehicles worldwide, "with current GPFs typically reducing PM emissions by over 95 percent." 89 Fed. Reg. at 28,086. EPA conducted a five-laboratory, five-vehicle test program (with vehicles ranging from passenger cars to Class 2b trucks), demonstrating that current-generation GPFs "can easily meet the final standard of 0.5 mg/mile in all three test cycles with a large compliance margin." 89 Fed. Reg. at 27,941. The Agency further noted that GPFs "are being used in series production by U.S., European, and Asian manufacturers," that "several manufacturers currently assemble vehicles equipped with GPF in the U.S. for export to other markets," 89 Fed. Reg. at 27,944, and that automotive suppliers "attested to having sufficient production capacity" to meet the Tier 4 Standards, *id.* at 27,940. In fact, a number of manufacturers (including Ford, General Motors, Stellantis, Mercedes, BMW, and Audi) are manufacturing two versions of the same model vehicles in the United States: one for export to China and Europe with a GPF installed, and another—of the same model—without the GPF, for sale domestically.[85] Ford, Volkswagen, Hyundai and others are also selling certain vehicle models in the U.S. equipped with GPFs.[86] And MECA stated that it expects automakers to offer GPFs on 50 additional models in the U.S. next year. EPA-HQ-OAR-2025-0194-0931 at 21 (2025 Comments of Manufacturers of Emission Controls Ass'n). Like compliance costs for ICE-vehicle NMOG+NOx technologies, costs for GPFs are also comparatively low, ranging from $119 to $372 per vehicle depending on engine displacement and discount rate. DRIA at 1-8, tbl.1-5. Based on the average MSRP of a vehicle purchased in 2026, the Agency's estimate for a GPF represents roughly 0.5% of the purchase price of a new vehicle.[87] Again, the Proposal fails to provide sufficient rationale for why implementing this technology is no longer feasible on the required timeline.

Each of these technologies was available to manufacturers when the 2024 Rule was finalized and they remain available today, at reasonable cost. *See* DRIA at 1-6, 1-8 (characterizing the quantified costs estimates as "savings" that manufacturers would realize under the delay, not as burdens of the 2024 Rule that could not be borne); *see also infra* subsection II-A-3. No information in the current rulemaking record suggests they have become technologically less feasible or less widely available since April 2024.

EPA now projects BEV market share of 8% in MY 2027 and 12% in MY 2028. DRIA at 1-9.[88] Even accepting these reduced projections, the remaining ICE fleet would need only modest improvements to meet both the NMOG+NOx and PM standards. For example, in MY 2027, at 8% BEV penetration (and therefore 8% of the fleet contributing zero mg/mile to the

[85] MECA, *MECA GPF Coverage Results* 3 (June 2026) (attached as Exhibit).

[86] The California Air Resources Board's *New Vehicle and Engine Certification* program issues Executive Orders certifying the emissions control technologies used in different vehicles tested, including GPFs. *See* Cal. Air Resources Bd., *New Vehicle and Engine Certification: Executive Orders for MY2025 Passenger Cars, Light-Duty Trucks, and Chassis Certified Medium-Duty Vehicles* (2026), https://ww2.arb.ca.gov/new-vehicle-and-engine-certification-executive-orders-my2025-passenger-cars-light-duty-trucks-and.

[87] The average MSRP of a new vehicle in the United States was $51,440 in February 2026. https://www.coxautoinc.com/insights/feb-2026-atp-report/.

[88] *See also* EPA, BEV Projected Market Share Analysis at tbl.1, EPA-HQ-OAR-2025-3297.

fleet average), the ICE portion of the fleet would need to achieve only approximately 27.2 mg/mile to meet the 25 mg/mile NMOG+NOx fleet average standard—barely below the current Tier 3 standard of 30 mg/mile. DRIA at 1-5, tbl.1-2. In MY 2028, with 12% BEVs, the required ICE NMOG+NOx fleet average would be approximately 26.1 mg/mile. DRIA at 1-5, tbl.1-2.

For PM, the math is similarly undemanding. The Tier 4 PM standard of 0.5 mg/mile is a per-vehicle standard subject to a gradual phase-in: only 20% of light-duty vehicles must meet it in MY 2027, rising to 40% in MY 2028. 89 Fed. Reg. at 27,930 tbl.33. Because BEVs have zero tailpipe PM emissions, BEVs can count toward meeting the phase-in percentage. Given that multiple manufacturers already assemble GPF-equipped vehicles in the United States for export, that suppliers have attested to "abundant manufacturing capacity," manufacturers already offer models in the U.S. with GPFs, and that per-vehicle GPF costs range from $137 to $372 depending on engine displacement, equipping a portion of the ICE fleet with a mature, globally deployed component is not a compliance challenge requiring additional lead time. *See* DRIA at 1-8, tbl.1-5; 89 Fed. Reg. at 27,940-41.[89]

These are marginal technological improvements that EPA's own cost analysis shows can be achieved at minimal cost. DRIA at 1-5 to 1-6, 1-8. Even at EPA's now-projected BEV levels, this is not a compliance challenge that demands a two-year regulatory reprieve. The Tier 4 Standards themselves confirmed feasibility of meeting the NMOG+NOx and PM standards at significantly lower BEV penetrations than the Proposal's projections—*lower than even today's BEV market share*, with the "No Additional BEVs Above Baseline" sensitivity analysis—modeling compliance at a 5% BEV market share—considered feasible. 89 Fed. Reg. at 28,084.

Developments since EPA finalized the Tier 4 rulemaking in 2024 provide additional evidence of adequate lead time to meet the MY 2027 and 2028 standards. EPA's publicly accessible vehicle certification results show that 68.3% of MY 2026 light-duty models among the top ten OEMs (excluding Tesla's all-electric fleet) certified at or below the MY 2027 Tier 4 NMOG+NOx standard of 25 mg/mi (*see* Table 5 below; *see also* Appendix 2, tbl.1). In fact, Ford, Honda, Hyundai, Nissan, Stellantis, and Toyota all had at least 70% of light-duty MY 2026 models certify at or below 25 mg/mi. Manufacturers have also signaled a shift towards implementing GPFs to comply with Tier 4 standards for PM. Ford, for example, had 22.9% of its ICE test groups for MY 2026 include GPFs (*see* Appendix 2 for more details), according to the California Air Resources Board's *New Vehicle and Engine Certification Program* data. If manufacturers are already certifying MY 2027 vehicles to Tier 4 Standards, the technology is plainly available and feasible within the existing timeframe. Under the existing Tier 4 MY 2027 phase-in, only 20% of vehicles need to be certified as Tier 4, with the remaining 80% interim vehicles meeting Tier 3. 91 Fed. Reg. at 28,467 & 28,468 tbl.2. EPA cannot credibly assert that the industry lacks adequate lead time while simultaneously acknowledging that portions of the industry have already certified vehicles to the full suite of standards.

[89] *See also* Geller & Brown, *supra*, at 8 https://www.4cleanair.org/wp-content/uploads/MECA-NACAA_MSF-02242026.pdf (explaining that "[m]illions of vehicles [have been] produced with GPFs in the US since 2022 and shipped to Europe/China").

EDF analyzed EPA's publicly accessible vehicle certification results,[90] which suggest that manufacturers are well-positioned to comply with these standards. Due to the limited time allowed for the comment period, EDF focused on EPA certification data for the top 10 original equipment manufacturers (OEMs) which represent roughly 90% of sales. EDF focused on MY 2025 and 2026 light-duty vehicles (LDVs). From MY 2025 to MY 2026, the percentage of these models certifying to 25 mg/mi NMOG+NOx increased by almost 8 percentage points. Importantly, an increasing majority of models are certified at or below 40 mg/mi, including 85.5% for MY 2026. Because OEM compliance with NMOG+NOx is assessed as a fleetwide average, over 85% of models certifying at or below 40 mg/mi indicates that OEMs' higher emitting models may be more easily balanced out by the remainder of the fleet, making it easier for OEMs to certify a fleetwide average of 25 mg/mi for MY 2027 and 23 mg/mi in MY 2028.

Table 5: Cumulative percentage of ICE LD models with average FTP certification levels below different NMOG+NOx thresholds (mg/mi) across MYs 2025-2026 (1,031 models)

MY	NMOG+NOx thresholds (mg/mi)						
	10	15	20	25	30	35	40
2025	1.5%	15.8%	47.5%	61.0%	67.7%	73.5%	82.9%
2026	1.0%	23.9%	52.6%	68.3%	75.7%	78.5%	85.5%

EPA's certification data also shows that automakers have been able to certify low-emitting models of all types of light-duty vehicles, including heavier light-duty trucks above 6,000 pounds (LDT3-4) and passenger cars up to 8,500 pounds (LDV). For example, 73.6% of MY 2026 LDV models certified at 25 mg/mi, the level of the MY 2027 Tier 4 standard.

[90] Certified Vehicle Test Results Report Data (Model Years: 2014 – Present) (xlsx) (updated June 2026), https://www.epa.gov/compliance-and-fuel-economy-data/annual-certification-data-vehicles-engines-and-equipment.

Table 6: Cumulative Percentage of MY 2026 ICE LD models with average certification levels below different NMOG+NOx thresholds (mg/mi) by Vehicle Class (498 models)

MY26	NMOG+NOx thresholds (mg/mi)						
Class	10	15	20	25	30	35	40
LDV	1.0%	25.9%	52.8%	73.6%	77.2%	78.8%	81.3%
LDT1	0.0%	25.0%	58.3%	91.7%	100.0%	100.0%	100.0%
LDT2	2.8%	36.1%	74.1%	85.2%	88.0%	92.6%	94.4%
LDT3	0.0%	24.3%	40.8%	51.5%	69.9%	73.8%	95.1%
LDT4	0.0%	2.4%	37.8%	51.2%	59.8%	62.2%	69.5%
Total	1.0%	23.9%	52.6%	68.3%	75.7%	78.5%	85.5%

Across the top OEMs, automakers have consistently demonstrated their ability to produce ICE models that certify to low levels of NMOG+NOx. For example, Ford, Honda, Hyundai, Stellantis, and Toyota all certified at least 80% of their MY 2026 models at or below 25 mg/mi

Table 7: Cumulative percentage of MY 2026 ICE LD models with average FTP certification levels below different NMOG+NOx thresholds (mg/mi) by manufacturer (498 models)

	NMOG+NOx thresholds (mg/mi)						
	10	15	20	25	30	35	40
Ford	4.2%	25.4%	66.2%	83.1%	83.1%	90.1%	94.4%
GM	0.0%	15.1%	29.2%	40.6%	57.5%	60.4%	77.4%
Honda	0.0%	32.4%	70.3%	86.5%	89.2%	94.6%	100.0%
Hyundai	0.0%	26.5%	63.3%	83.7%	89.8%	91.8%	95.9%
Nissan	0.0%	34.5%	55.2%	75.9%	86.2%	86.2%	100.0%
Stellantis	0.0%	9.1%	65.5%	80.0%	80.0%	80.0%	83.6%
Subaru	0.0%	23.5%	23.5%	64.7%	82.4%	82.4%	94.1%
Toyota	2.3%	43.0%	67.4%	82.6%	90.7%	93.0%	94.2%
Volkswagen	0.0%	8.3%	27.1%	35.4%	39.6%	41.7%	43.8%

Tier 4 provides OEMs with more granular bins to certify to, every 5 mg/mi, compared to Tier 3 bins, which are mostly every 20 mg/mi.[91] EDF assigned each model to a theoretical bin, providing a 30% compliance cushion for OEMs. For more discussion on the methodology, *see* Appendix 2.

[91] Tier 3 has Bin0, Bin20, Bin30, Bin50, Bin70, Bin125, and Bin160.

Table 8: Cumulative percentage of MY 2026 ICE LD models with Theoretical Bins below different NMOG+NOx thresholds (mg/mi) by manufacturer (30% margin) (498 models)

MY 2026	NMOG+NOx thresholds (mg/mi)					
	15	20	25	30	35	40
Ford	7.0%	25.4%	64.8%	80.3%	83.1%	83.1%
GM	0.0%	15.1%	25.5%	34.0%	43.4%	57.5%
Honda	5.4%	32.4%	64.9%	81.1%	86.5%	89.2%
Hyundai	0.0%	26.5%	57.1%	75.5%	83.7%	89.8%
Nissan	6.9%	34.5%	51.7%	75.9%	79.3%	86.2%
Stellantis	0.0%	9.1%	20.0%	74.5%	80.0%	80.0%
Subaru	0.0%	23.5%	23.5%	64.7%	64.7%	82.4%
Toyota	10.5%	43.0%	66.3%	76.7%	82.6%	90.7%
Volkswagen	0.0%	8.3%	27.1%	27.1%	37.5%	39.6%
Total	3.6%	23.9%	45.2%	62.9%	69.3%	75.7%

Automakers' fleets are not only certifying more models at low levels of NMOG+NOx but also certifying more vehicles with GPFs. As summarized in Table 9 below, California Air Resources Board's *New Vehicle and Engine Certification program* data on emission control technology on each model shows ten OEMs have vehicles with GPFs including Ford, Volkswagen, and Hyundai.

Table 9: Number and Percentage of Test Group Vehicles with GPFs among all manufacturers in MY 2026

OEM	Test Groups Tested	Test Groups with GPFs	% of Test Groups with GPFs
Aston Martin	6	3	50.0%
BMW	28	8	28.6%
Porsche	15	4	26.7%
Ferrari	5	5	100.0%
Ford	48	11	22.9%
Hyundai	31	1	3.2%
Jaguar Land Rover	12	3	25.0%
Lotus	2	1	50.0%
Maserati	2	1	50.0%
Volkswagen	26	4	15.4%
Total among OEMs with GPFs	175	41	
Other	220	0	
Total, including all models tested	395	41	

d. Tier 4 Program Flexibilities Provide Additional Evidence of Adequate Lead Time.

EPA purports to be concerned about potential changes to the BEV market, but, importantly, EPA's criteria pollutant program built in flexibilities that can relieve manufacturers of just this kind of transitional change. The Tier 4 program carries forward the well-established Averaging, Banking, and Trading ("ABT") provisions that have been a feature of EPA's vehicles programs since the 1980s. *See* 89 Fed. Reg. at 28,087-89. EPA allows manufacturers to carry Tier 3 NMOG+NOx credits into the Tier 4 program, 89 Fed. Reg. at 27,935, and permits manufacturers to carry forward deficits for one model year, *id.* at 27,916. Notably, EPA indicates that it "has seen little trading of NMOG+NOx credits between companies during the Tier 3 program." DRIA at 1-2. This absence of credit trading suggests that all manufacturers have been in compliance, and suggests the existence of a large credit bank implying there is no impending compliance crisis for MYs 2027 and 2028. While EPA notes that "the Agency does not have sufficient information to project how companies who have banked credits may use those credits in MYs 2027 and 2028," DRIA at 1-2, EPA failed to review, consider, or make available for comment *any* information about existing banks of credits that can support compliance and relieve any alleged lead time concerns.

Moreover, the ABT provision allowing manufacturers to carry forward NMOG+NOx deficits for one year provides an additional buffer. A manufacturer that cannot fully meet the MY 2027 fleet average standard through application of emission-reduction technologies alone may utilize its own banked compliance credits, purchase credits from another manufacturer, or carry a deficit into MY 2028 and offset it with credits generated or purchased in that year. EPA cannot plausibly assert that additional lead time is "necessary" under Section 202(a) when it (a) has

already built into the program the very flexibility mechanisms designed to address year-to-year compliance variability and (b) makes no attempt whatever to analyze how those mechanisms can obviate its purported lead time concerns.

e. EPA's Assertions Regarding Lead Time Are Undercut by the Proposal's Descriptions of a Forthcoming Part 2 Rulemaking and by Automaker Behavior.

EPA's lead time argument is further undercut by the Proposal's own description of its forthcoming "Part 2" rulemaking. *See* 91 Fed. Reg. at 28,463 ("Potential amendments to the Tier 4 standards and other program elements will be proposed separately in a future Part 2 rulemaking."). The Agency states it will "comprehensively reconsider the Tier 4 program for light- and medium-duty vehicles, which may include, for example, changes to the Tier 4 emission standards, lead time and phase-in schedule, and test procedures." 91 Fed. Reg. at 28,466. This structure—an unsupported, slapdash two-year "delay" that would already reduce stringency, followed by a "comprehensive[] reconsider[ation]" of those same standards—betrays what likely is EPA's true strategy. EPA is not providing necessary additional lead time for manufacturers to ultimately achieve the existing Tier 4 Standards, but instead is buying time for the Agency to finalize a rule that would deal with the standards "comprehensively" and no doubt weaken them further—a scheme that Clean Air Act Section 202(a)(2) does not authorize. Any such weakening would be unlawful and run afoul of the Act's anti-backsliding provisions. *See supra* subsection I-B.

Section 202(a)(2) mandates adequate lead time "to permit the development and application of the requisite technology." 42 U.S.C. § 7521(a)(2). It does not permit a regulatory pause, unsupported by the record, while the Agency reconsiders whether the standards should exist at all. Manufacturers cannot meaningfully use a "lead time" period to prepare for compliance when they do not know what standard they will ultimately need to meet. And here, at least for MY 2027, EPA is attempting to provide lead time for compliance with a model year that has already begun and will be nearly complete by the time the Proposal is finalized. Rather than providing lead time for manufacturers to achieve compliance with Tier 4, EPA is simply providing time for manufacturers to do nothing while waiting to learn whether the Tier 4 Standards will be weakened or replaced entirely. This is not a permissible exercise of EPA's authority under Section 202(a)(2).

Ultimately, EPA's Proposal treats manufacturers' alleged preference for producing ICE vehicles without enhanced emission control technologies as equivalent to an inability to produce compliant vehicles. Automaker announcements rolling back BEV production and increasing ICE production reflect business decisions about which products to manufacture. Automaker manufacturing plans are not evidence of infeasibility. They do not reflect an inability to equip ICE vehicles with improved emission controls. No manufacturer has stated that it cannot source catalysts, cannot obtain GPFs, or cannot calibrate its engines to achieve lower emissions. Section 202(a) does not permit EPA to suspend standards simply because manufacturers would rather not incur the modest cost of compliance. If criteria pollutant standards were to be based on automaker preferences rather than feasibility, EPA would have no role other than to set standards that reflect what automakers are already planning to manufacture and Congress's direction in the Clean Air Act would be rendered toothless.

Nevertheless, EPA claims that the legislative changes and "impact[s] [on] near-term projections of BEV market share from what the EPA considered when developing the Tier 4 standards" have resulted in "significant disruption in manufacturer product planning," 91 Fed. Reg. at 28,467, and the need for additional lead time. EPA engaged deeply with manufacturers over a period of years to develop the Tier 4 Standards, culminating in the 2024 Rule. Those standards have already been in place without interruption for more than two years. Even accepting EPA's unsupported assertion that changes in federal and state laws since promulgation of the Tier 4 Standards require manufacturers to alter their compliance strategies from a BEV-centric approach to one involving more significant emission reductions from non-BEV vehicles, it would be eminently feasible for automakers to implement such changes within the existing timeframe. The primary technologies, as explained above, are mature, volume-production technologies. Crucially, the Proposal acknowledges that "the emissions control technologies considered in this proposal for MYs 2027 and 2028 are already in volume production, therefore the Agency has not performed a detailed feasibility assessment of these technologies." DRIA at 1-3. In other words, EPA itself does not dispute that the technology is ready—it disputes only whether manufacturers have had time to plan for its deployment. *See* 91 Fed. Reg. at 28,467 ("[I]ndustry practices… indicate a year to 18 months would be necessary to adjust production plans").[92]

Moreover, EPA's lead time assertions are contradicted by evidence that manufacturers can, in fact, pivot quickly when needed to meet regulatory requirements or market demands. Manufacturers continually update their product line based on customer demand, regulatory requirements, the availability of new technology, a desire to increase profits, or some combination of these factors. This is illustrated well by data from the *Baum and Associates North American Automotive Production Forecast*, which has been provided to automotive industry participants since 1990 and includes a Product Life Cycle that illustrates the timing and nature of product changes by vehicle nameplate. According to Product Life Cycle data, during the period of Model Years 2022 through 2025, automakers made a significant number of changes in their product offerings in response to various market and regulatory factors—on average, 49.5 changes per model year including BEVs, and 36.75 excluding BEVs. In total, manufacturers changed, launched, or terminated 198 products, the majority of which (147) were for non-BEV vehicles, over these four model years.[93] Additionally, this data understates the volume of vehicle changes because some product updates do not qualify for inclusion.

Some examples from Baum and Associates help demonstrate how manufacturers can quickly pivot to meet both market and/or regulatory demands. The Ram Pickup has been critical

[92] While EPA's Proposal mentions a "four to five year" automobile development cycle, 91 Fed. Reg. at 28,471, it further notes that mid-cycle refreshes and full-scale vehicle redesigns can happen in the one- to two-year timeframe. *Id.* EPA ultimately suggests that the lead time necessary for the "adjust[ments]" needed would be "a year to 18 months," *id.* at 28,467, much less than the four- to five-year full development cycle. Moreover, the only authority EPA cites for its assertion of a "four to five year" typical automobile development cycle is an outdated 2007 study from the Center for Automotive Research that predates the modern era of modular vehicular platforms and flexible manufacturing. 91 Fed. Reg. at 28,472 n.48. The Center for Automotive Research study is also refuted by the automakers' own conduct. The massive, rapid shifts in product planning described in EPA's Proposal demonstrate that modern automakers can and do make major production decisions on far shorter timelines.

[93] *See* Baum & Associates, *product life cycle MY22-MY25*, Tab 2 Exhibits (attached as Exhibit).

to Stellantis' volume and profits and has gained significant volume in recent years.[94] In late-2022, the engine options were reduced by dropping one of their diesel options while introducing a new high-tech six-cylinder engine that provided better fuel economy as a means to maintain capability for the customer while responding to increasing requirements for fuel economy and reduced emissions.[95] For the next two years, volumes of the 8-cylinder Hemi were reduced (most dramatically in the second year) in favor of the Pentastar V-6 and the 3.0 Hurricane with the Hemi only available on larger versions of the product in Model Year 2025.[96] Following a change in company leadership and federal emissions policy, the Hemi was quickly returned to the lineup in high volume *mere months after the decision was made* even as the company was required to make major production changes, both internally at its engine and vehicle assembly plants and with many of its key engine part suppliers.[97] Among other things, to accomplish this, engineers had to ensure 13 separate control modules could communicate and operate correctly and quickly gather the durability data needed to support Ram's 10-year/100,000-mile powertrain warranty.

Similarly, according to Baum and Associates, in the early 2020s, Ford offered a range of powertrains on the F-150 including two EcoBoost engines, a large V-8 engine, a diesel offering, and a hybrid designed to meet a range of customer desires and maximize volume for the company's most important product.[98] The Volkswagen Dieselgate scandal led many automakers including Ford to move away from diesel, and Ford quickly pivoted to higher hybrid volumes and by 2022, to the Lightning electric pickup. This year, it dropped the Lightning and continues to increase hybrid volume (Ford is aiming for 50% of its global volume to be hybrids, extended-range EVs, and EVs by 2030).[99] This is another illustration of a company having a variety of options available and pivoting as needed to maximize customer choice while remaining in regulatory compliance. These changes were not simple, as they require changes in engine componentry and assembly as well as vehicle assembly, while making significant adjustments in their supplier network, and yet they were accomplished rapidly.

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[94] *See Stellantis is Counting on This brand to Soar in North America -- Huge Profits on the Line,* https://www.fool.com/investing/2026/06/05/stellantis-counting-brand-ram-soar-profits/.

[95] *See* Baum and Associates, Engine and Propulsion Type Breakdowns for F-150 and Ram Pickup, Tab 1, Row 3 (V-6 Diesel phased out) and Row 4 (I-6 introduced MY23) (attached as Exhibit).

[96] *See* Baum and Associates, Engine and Propulsion Type Breakdowns for F-150 and Ram Pickup, Tab 2, Rows 3 (Pentastar), 5 (Hurricane), and 6 (Hemi) (attached as Exhibit).

[97] *See* Baum and Associates, Engine and Propulsion Type Breakdowns for F-150 and Ram Pickup, Tab 2, Row 6 (showing increased MY26 volume after substantial MY25 decline) (attached); *see also* Esterdahl, *Ram's 5.7 Liter Hemi Return Required a Multi-Million Dollar Trip to New Zealand and It's Paying Off,* https://pickuptrucktalk.com/2026/06/rams-5-7-liter-hemi-return-required-a-secret-multi-million-dollar-trip-to-new-zealand-and-its-paying-off/.

[98] *See* Car and Driver, *2022 Ford F-150,* https://www.caranddriver.com/ford/f-150-2022.

[99] *See* Vaughn, *Ford kills the F-150 Lightning, Bets on Hybrids Instead,* https://www.autoweek.com/news/a69735568/ford-axes-f-150-lightning-announces-erev-hybrid/; *see also* Baum and Associates, Engine and Propulsion Type Breakdowns for F-150 and Ram Pickup, Tab 3, Row 3 (showing increased hybrid production).

As these examples show, automakers have a range of options available and as desired (due to consumer demand and/or financial goals) or as required (by regulatory requirements) can make swift changes in their products.

Analysis done by EDF (attached as an Exhibit) shows that numerous vehicle models decreased their NMOG+NOx testing FTP results from year-to-year outside of a model's full redesign, showing that improvements to NMOG+NOx emissions can happen outside of longer vehicle redesign cycles.[100] EDF's analysis also shows that, of the models considered, at least 49 models had annual NMOG+NOx improvements of at least 10% twice in years between MYs 2021 and 2026, which ensures at least one, and in many cases multiple, large decreases occurred outside of a regular full vehicle redesign.

The Proposal's lengthy allegations of how automakers have rapidly pivoted away from BEVs further undermines the assertion that manufacturers cannot now change their plans and therefore need additional lead time. Automakers' demonstrated ability to respond to the Administration's policy changes, by rapidly abandoning entire vehicle lines within a single year, shows that lead time concerns are wholly overblown. According to EPA, manufacturers have recently announced billions of dollars (aggregated) in write-downs of BEV investments, cancelled BEV models, halted BEV production lines, and redirected capital to ICE vehicle production—all within approximately one year. *See* 91 Fed. Reg. at 28,471-72 (claiming there have been "significant[]" changes in production strategy "in just the past year"). These decisions involved wholesale restructuring of capital investment plans, manufacturing facilities, workforce allocations, and supply chain relationships—executed at a rapid pace. EPA then asserts, in the same Proposal, that these very manufacturers cannot add proven and inexpensive emission control hardware—catalysts and GPFs—to the ICE vehicles they just pivoted to produce. The Agency claims that "there is not sufficient lead time for firms to make such changes." 91 Fed. Reg. at 28,472. But if manufacturers can cancel billion-dollar BEV programs, redirect capital expenditures across multiple plants, and restructure their entire product portfolios within twelve months, they can certainly source incremental catalyst content and gasoline particulate filters—components already manufactured at scale by existing suppliers—within the same period or less. EPA provides no evidence to the contrary and EPA's contradictory justifications are arbitrary on their face.[101]

Even assuming that EPA is correct that automakers must revise their compliance strategies, and that some vehicles might not be able to meet the MY 2027 and MY 2028

[100] *See* Environmental Defense Fund, EDF - Analysis of EPA Certification Data for NMOG NOx Lead Time (attached as Exhibit).

[101] EPA also likely has information about manufacturer compliance plans that it has not shared in the Proposal. Manufacturers must be making compliance plans for MY 2027 assuming they will need to comply with Tier 4 Standards. Any application for certification for a vehicle must contain information about the manufacturer's compliance plans, including testing data and expected sales. *See, e.g.*, 40 C.F.R. §§ 86.1829-15, 86.1843-01, 86.1844-01. Despite these regulatory requirements, the Proposal claims that "the product mix and sales volume for MY 2027 are unknown and thus the impacts on NMOG+NOx fleet averages are unknown." 91 Fed. Reg. at 28,473. Because automakers are required to provide a compliance plan when seeking certification, and it would be inconsistent with Clean Air Act Section 206 for EPA to certify MY 2027 vehicles without having a basis for concluding that the vehicles meet the fleet average standards for NMOG+NOx, EPA must have additional information as to automakers' ability and plans to meet the Tier 4 Standards.

standards, the availability of multiple compliance flexibilities ensures that any residual gap can be bridged. As noted above, "EPA has seen little trading of NMOG+NOx credits between companies during the Tier 3 program," DRIA at 1-3, meaning every manufacturer has been able to independently meet or exceed the Tier 3 NMOG+NOx fleet average standard for years, likely accumulating credit banks. These banked credits can offset any near-term compliance gap. Tier 4 compliance is overwhelmingly feasible on the original timeline, even considering BEV market changes.

Manufacturers have not been "forced" to abandon their BEV plans, and many consumers would purchase BEVs even without the types of purchase incentives rescinded under the OBBB Act. But even assuming EPA is correct that there has been a broad-based change in the market and manufacturers need to change their compliance strategies, there is plenty of time to do so. There is no reason to delay the MY 2027 and 2028 standards, as they are achievable. If policy changes in summer 2025 necessitated changes to manufacturers' compliance strategies, they have now had a full year to begin to implement those changes. EPA's attempted lead-time justification for issuance of a delay rule in late 2026 is therefore arbitrary and capricious.

f. EPA Fails to Provide Adequate Justification for the Agency's Prior, Contradictory Factual Findings Regarding Lead Time.

Under *Fox Television*, 556 U.S. at 515-16, an agency changing its position must provide a more detailed justification than what would suffice for a new policy on a blank slate when "its new policy rests upon factual findings that contradict those which underly its prior policy." EPA's 2024 Rule rested on detailed factual findings that the Tier 4 Standards were technologically feasible, that the requisite technology was "already developed and demonstrated in production vehicles," and that compliance was achievable using "solely IC-based vehicles with improved emissions controls," including at BEV market penetration levels much lower than the Proposal projects. *See, e.g.*, 89 Fed. Reg. at 28,084, 28,087, 27,898 n.510, 27,932. The Proposal reaches the opposition conclusion—that the standards cannot feasibly take effect as scheduled—yet EPA has not identified any new factual finding that contradicts the 2024 technological feasibility and lead time determinations. The Agency does not claim that catalysts have become more expensive, that GPFs have become less effective, or that supplier capacity has diminished. Instead, EPA relies on a change in BEV market projections that, as demonstrated above, is irrelevant to the ICE emission control technologies on which Tier 4 compliance rests. Under *Fox Television*, EPA's failure to "provide a more detailed justification" for reversing its prior factual findings—including explanation of "why the original reasons for adopting" the 2024 compliance timeline "are no longer dispositive," *Fox Television*, 556 U.S. at 514—renders the Proposal arbitrary and capricious.

3. <u>EPA's Consideration of Costs Is Arbitrary and Unreasonable.</u>

a. EPA's Proposal Shows That Compliance with the Tier 4 PM Standard Would Be Low-Cost and Feasible.

In the 2024 Rule, EPA developed the Tier 4 Standard for PM emissions of 0.5 mg/mi after thorough research of available technologies and rigorous testing at EPA facilities. 89 Fed. Reg at 27,941. EPA determined that the Tier 4 PM standard for light- and medium-duty vehicles can be met through the installation of gasoline particulate filters (GPFs). EPA testing of GPFs

proved the feasibility of a vehicle achieving the Tier 4 PM standard across all test cycles, with a large compliance margin. *See id*.

In the Proposal, EPA estimates the cost of a GPF as ranging from $119 to $372 per vehicle depending on engine displacement and discount rate. DRIA at 1-8, tbl.1-5. Therefore, using the Agency's own cost analysis, installation of a GPF represents only 0.5% of the average MSRP of a vehicle purchased in 2026.[102] This is well below the price tag that Congress accepted under Section 7521. *See Motor & Equip. Mfrs. Ass'n, Inc. v. EPA*, 627 F.2d 1095, 1118 (D.C. Cir. 1979) (reviewing legislative history and concluding that Section 7521's "cost of compliance" requirement was meant to avoid "undue economic disruptions" for automakers and "doubling or tripling" motor-vehicle prices).

Notably, other independent studies found similar costs. In 2023, a MECA industry assessment found GPFs would cost approximately $50-$300 per vehicle, depending on engine displacement. *See* EPA-HQ-OAR-2025-0194-0931 at 21 (2025 Comments of Manufacturers of Emission Controls Ass'n). ICCT also studied the incremental direct cost of GPFs in 2011 and again in 2023, finding similar costs adjusted for inflation: ICCT's 2023 estimate was $87-$261 per vehicle.[103]

These compliance costs are also comparable to the costs that EPA found appropriate during the Tier 2 and Tier 3 rulemakings. EPA estimated that the Tier 2 Standards would increase per-vehicle purchase price by $49-258 ($103-$509 in 2024$[104]), depending on the model year and vehicle class. 65 Fed. Reg. at 6698, 6775 tbl.IV.D.–1. EPA estimated the Tier 3 Standards exhaust emission standards would result in per-vehicle technology costs of $43-75, in 2011 dollars ($61-107 in 2024$[105]), per vehicle depending on the model year and vehicle class. 2024 Rule RIA at 2-46, tbl.2-46.

On the basis of the Agency's own record, there is thus no rational basis on which EPA could now reverse its prior position and conclude that the costs of achieving the Tier 4 PM standard are unreasonable for MYs 2027 and 2028 vehicles.

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[102] The average MSRP of a vehicle in the United States was $51,440 in February 2026. *See* https://www.coxautoinc.com/insights/feb-2026-atp-report/.

[103] ICCT Fact Sheet, *What EPA's new multi-pollutant emissions proposal means for PM emissions and GPFs* (Nov. 2023), https://theicct.org/wp-content/uploads/2023/11/ID-48-%E2%80%93-U.S.-GPF-fact-sheet-letter-70112-v3.pdf; R. Minjares & F. Posada Sanchez, *Estimated cost of gasoline particulate filters*. *International Council on Clean Transportation* (2011), https://theicct.org/publication/estimated-cost-of-gasoline-particulate-filters/.

[104] This assumes EPA utilized 1997$ in the Tier 2 rulemaking. The specific dollar year EPA used in the Tier 2 rulemaking is not clear as the Agency does not specify. However, elsewhere in calculating compliance costs, the Agency used 1997$. *See* U.S Bureau of Labor Statistics, CPI Inflation Calculator, https://www.bls.gov/data/inflation_calculator.htm?utm=syndication.

[105] Utilizing U.S Bureau of Labor Statistics, CPI Inflation Calculator, https://www.bls.gov/data/inflation_calculator.htm?utm=syndication.

b. EPA Overestimates PM Compliance Costs.

As explained above, compliance with the Tier 4 PM standard is cost-reasonable even under the Proposal's own cost analysis. But the Proposal also *overestimates* compliance costs, further underscoring the reasonableness and achievability of the PM standard.

Specifically, according to the following analysis performed by ERM, EPA incorrectly calculates GPF costs which leads the Agency to overestimate the fleetwide cost savings from the Proposal. There are two key errors in the formula EPA used to calculate GPF costs in the Proposal, which stem from flaws in EPA's cost analysis in the 2024 Rule (which formed the basis of the GPF cost analysis in the Proposal).

In the 2024 Rule RIA, EPA described GPF cost in detail in Section 3.2.6.4. The key cost components of that analysis are summarized below:

- All costs are presented in 2011 dollars and are converted to 2022 dollars with a multiplier of 1.296.
- A GPF swept volume ratio of 0.8 is used, updated from 0.55 in the Tier 2 analysis (taken directly from the source paper). The swept volume ratio represents the GPF volume relative to the engine volume.
- The substrate cost is reduced from $30/literGPF to $21/literGPF, in 2011 dollars. In 2022 dollars, that becomes $21 * 1.296 = $27.22/literGPF
- Fixed costs, which include accessories, pressure sensor, labor, and 40% overhead, total $39.58 in 2011 dollars. In 2022 dollars, that becomes $39.58 * 1.296 = $51.30
- Warranty costs total 3% of all costs.
- A production volume discount of 20% is applied.

The 2024 Rule RIA thus calculated the **fixed cost** of a GPF as:

$$FC = \$51.30 * 1.03\ (warranty) * 80\%\ (volume\ discount) = \$42.27$$

And the 2024 Rule RIA calculated the **variable cost** of a GPF as:

$$VC = \frac{\$27.22}{literGPF} * 1.03\ (warranty) * 80\%\ (volume\ discount) = \frac{\$22.43}{literGPF}$$

The complete formula for the GPF cost, with a markup to cover indirect costs applied, would then be:

$$GPF = (\$22.43 * GPF\_LITERS + \$42.27) * Markup$$

In the Proposal's DRIA at 1-7, however, EPA calculates GPF cost using the following equation, taken from Section 2.6.1.1.3 of the 2024 RIA (where "LITERS" represents engine displacement in liters):

$$GPF = (42.269 * LITERS + 22.213) * Markup$$

There are two key errors in this DRIA formula. First, the variable and fixed costs are switched. Second, the variable cost units are in GPF volume, not engine displacement.[106] These errors from the 2024 cost formula were imported into the Proposal, which used this flawed formula.

Fixing these errors, the corrected GPF cost formula, in 2022$, should be:

$$GPF = (22.213 * 0.8\,(swept\ volume\ ratio) * LITERS + 42.269) * Markup$$
$$GPF = (17.77 * LITERS + 42.269) * Markup$$

Table 10 below summarizes the impacts of both formula errors on the undiscounted cost savings presented by the DRIA.[107] As the table shows, the corrected central GPF cost ($128) represents a 28% reduction in GPF costs compared to the DRIA's central cost assumption. In other words, compliance with the Tier 4 PM standard is even less costly than EPA's erroneous, but nonetheless already cost-reasonable, assumptions in the Proposal.

Table 10: Impacts of GPF formula correction on fleetwide savings

Formula version	Per-vehicle cost range, undiscounted (2024$)	Fleetwide savings MY27, undiscounted (2024m$)	Fleetwide savings MY28, undiscounted (2024m$)
Tier 4 DRIA	$137 - $372 ($179 central)	$220	$510
Swapping variable and fixed costs	$121 - $246 ($144 central)	$180	$410
Applying swept volume ratio	$110 - $211 ($128 central)	$160	$370

[106] The difference in the variable cost between the 2024 Rule RIA and the Proposal's DRIA likely can be attributed to rounding errors of the $21/liter GPF, so we assume that 22.213 is the correct variable cost factor. The alternative explanation for the unit error would be that the production volume discount should not be applied to the variable cost (swept volume ratio and production volume discount are both 0.8), but that scenario seems unlikely.

[107] To maintain consistency with EPA's results, which rounded outputs to two significant figures, the results in Table 10 are rounded in the same way. The results in Table 10 are drawn from calculations performed by ERM and attached as Exhibit: ERM, cost recalculation, Tab 2 - GPF_cost_calc, EPA_Tier4_delay_central_cost_recalculations_2026_06_24.

c. EPA Inconsistently and Unreasonably Uses Two Different Models to Project BEV Penetration Rates When Assessing the Impacts of the Proposal, Resulting in an Overestimate of Cost Savings.

The Proposal is also arbitrary and capricious and unlawful because EPA's analysis of the Proposal's impacts is internally inconsistent and flawed, leading EPA to potentially overestimate cost savings associated with the Proposal. The MOVES model projects EV penetration rates that are higher than the OMEGA model. Because of this difference, EPA's inconsistent use of the two different models to predict BEV penetration results in cost "savings" that appear higher than if EPA had used the MOVES EV penetration levels.

For the main cost analysis for the Proposal, EPA uses the OMEGA model to project BEV market share in MYs 2027 and 2028. DRIA at 1-2. These values are 8% in MY 2027 and 12% in MY 2028 for all light-duty vehicles. EPA also conducted a sensitivity analysis, again using OMEGA, considering higher and lower BEVS levels of 4%, 8%, and 12% BEVs in MY 2027 and 8%, 12%, and 16% in MY 2028. DRIA at 1-10, 1-11. By using OMEGA, even in the sensitivity case, EPA underestimates the BEV sales compared to if the Agency used MOVES.

MOVES assumes higher EV levels than the OMEGA model. *See* DRIA at 2-2. Those levels are 7.6%, 11.7%, and 15.8% for MY 2027 and 8.4%, 12.5%, and 16.6% for MY 2028. DRIA at tbl.2-1.

Using the OMEGA BEV forecasts, instead of the MOVES forecasts, to assess costs causes EPA to overestimate the cost savings of the Proposal. ERM recalculated compliance costs utilizing the MOVES EV forecasts to quantify EPA's overestimation of cost savings. Because the MOVES EV forecasts are higher than the OMEGA BEV forecast utilized by EPA in the Proposal, fewer ICE vehicles must be deployed for compliance with the PM standards, which in turn lowers compliance cost. When utilizing MOVES EV forecasts, ERM found that industry cost savings associated with PM controls are 8-14% lower, depending on the EV forecast scenario.[108]

When combined with the correction of EPA's overestimation of GPF cost (as explained above, corrected PM costs are 28% lower than those used in the DRIA), industry cost savings associated with the Proposal's weaker NMOG+NOx and PM controls combined are approximately 10% lower than those in the DRIA.[109]

Because any corrected analysis must be noticed to the public for additional comment, the only way for EPA to correct the plain and misleading analytical errors in its cost analysis is to withdraw the Proposal.

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[108] ERM calculated a Low, Central, and High EV sales scenario. For example, looking at the Central EV Scenario, OMEGA (DRIA) assesses a cost "savings" of $730 versus MOVES's cost savings of $654. *See* ERM, cost recalculation, Tab 1-EPA Tier 4 Revision DRIA: Recalculation of cost "savings" associated with different BEV scenarios (attached as Exhibit; ERM - cost recalculation).

[109] *See* ERM, cost recalculation, Tab 2-EPA Tier 4 Revision DRIA: Recalculation of cost "savings" associated with different BEV scenarios & corrected GPF cost (attached as Exhibit: ERM - cost recalculation).

d. EPA Unreasonably Assumes That MY 2026 ICE Vehicles Will Achieve Only the Tier 3 Standard and Otherwise Overestimates Cost Savings.

By assuming the fleet is only achieving the Tier 3 Standards, and not greater emissions reduction, the Agency arbitrarily overestimates the cost savings of the Proposal. In estimating the cost of the Proposal, EPA assumes "for the no-action case ... that light-duty vehicles up to 6,000 pounds GVWR will meet the Tier 3 fleet-average standard of 30 mg/mile in MY 2026." DRIA at 1-2. EPA provides no explanation for its decision to assume that the light-duty vehicle fleet will only meet the Tier 3 standard of 30 mg/mile instead of setting an ICE vehicle baseline that is based on data showing what the fleet is *actually* achieving in MY 2026. This is information that manufacturers report to the Agency and that the Agency has available to establish a real-world baseline.[110]

EPA unreasonably provides no explanation as to why it is rational to disregard this data and assume simple compliance with the Tier 3 MY standard. Indeed, EPA itself recognizes that the 30 mg/mi baseline is in fact an upward bound that may not be an accurate representation of real-world compliance. The Agency acknowledges that given that "some manufacturers have already certified some vehicle models to the final Tier 4 standards for MY 2027," those "manufacturers [thus] may not realize the full level of cost savings estimated." DRIA at 1-3. As a result, EPA recognizes the "cost savings estimated in this chapter represent an upper bound." *Id.* Overall, EPA's failure to consider relevant information regarding MY 2026 compliance that is plainly in its possession renders this action unlawful. *See State Farm*, 463 U.S. at 43.

Furthermore, EPA's DRIA indicates that EPA's costs estimates may be overestimates given EPA's failure to account for banking and trading flexibilities (*see* DRIA at 1-2), failure to account for sunk costs for MY 2027 (*see* DRIA at 1-3), failure to estimate cost savings from PFI injectors (*see* DRIA at 1-8), and failure to account for more cost-effective compliance pathways (*see* DRIA at 1-4 n.2). EPA has failed to explain how these factors do not result in the Agency overestimating the Proposal's cost savings, rendering EPA's analysis arbitrary and capricious.

B. EPA Fails to Adequately Consider and Weigh Reliance Interests.

In setting emission standards, EPA must comply with the requirements of reasoned decision-making according: it must acknowledge policy changes, explain why it is adopting the new policy, and adduce a more detailed justification where the new policy undermines serious reliance interests or contradicts prior factual findings. *See generally Wages & White Lion,* 145 S. Ct. at 917–18 (citing *Encino Motorcars,* 579 U.S.at 221–22; *Fox Television*, 556 U.S. at 515; *State Farm*, 463 U.S. at 43). As the D.C. Circuit recently explained, agencies must assess whether their actions affect reliance interests—in that case, the interests of entities that incurred significant financial obligations based on longstanding agency policies—and, if so, must explain "why these financial concerns were unjustified, entitled to no weight, or outweighed by other considerations," *Capital Power Corp.*, 15 F.4th at 650. Here, EPA failed to identify some serious

[110] As described further below in subsection III-A *infra*, EPA has unlawfully failed to publish and docket this information, as well as other data that is essential for the public to fully and meaningfully evaluate and comment on the Proposal.

reliance interests altogether and, where it did note them, proffered no reasonable explanations for overriding them.

First, manufacturers, companies who develop and build pollution-control technologies, and other entities spanning the entire automotive supply chain, rely on EPA's longstanding rules in building their business plans in response to standards that account for technical feasibility, costs, and lead time, enabling sound corporate asset allocation and planning. Here, those businesses have expended significant resources in reliance on the Tier 4 Standards that are now in jeopardy. They should not now be put at a competitive disadvantage, when compared to non-complying competitors who did not incur those costs, because of EPA's abrupt about-face, absent fulsome and reasonable explanations.

Second, States and local governments rely on EPA's standards in multiple ways. They seek to purchase vehicle fleets with ever lower emissions to protect their residents' health and welfare, and they make their plans with the expectation of being able to purchase those cleaner vehicles. States and local governments also rely on increasing vehicle pollution reduction to maintain or come into compliance with the NAAQS. These reliance interests are in jeopardy if EPA finalizes the Proposal.

Third, consumers and the public rely on and benefit from EPA rules to do what they are intended to and have done for decades—continually reduce and prevent pollution and its deadly consequences and stimulate an ever-increasing number and a wide variety of cleaner vehicles offered for purchase. Many consumers looking to purchase these new (and used) cleaner vehicles intentionally alter or delay their purchases so they can own the next-generation clean vehicles with the attributes they want when they come on the market.[111] EPA's Proposal frustrates that longstanding consumer reliance on the availability and wide choice among models of cleaner vehicles.

Agencies that change their position or prior policies must consider the reliance interests that have arisen from those prior positions. They must both be "cognizant that longstanding policies may have engendered serious reliance interests that must be taken into account," and also provide "[a] reasoned explanation ... for disregarding facts and circumstances that underlay or were engendered by the prior policy." *Wages & White Lion*, 145 S. Ct. at 918 (citing *Encino Motorcars*, 579 U.S. at 221-22 (internal quotation omitted)). Stated another way, when rescinding a rule, an agency, because it is "not writing on a blank slate," must "assess whether there were reliance interests, determine whether they were significant, and weigh any such interests against competing policy concerns." *Regents,* 591 U.S. at 33.

That EPA here *is* changing its position is indisputable, as it reverses the determination it made just two years ago that the Tier 4 Standards for MYs 2027 and 2028 were indeed feasible, cost effective, allowed for sufficient lead time, and were needed to protect public health. The Proposal thus triggers the obligation to provide detailed explanations of why the Agency's prior position was wrong and its new policy suddenly outweighs the many reliance interests in the

[111] *E.g.,* McKinsey & Company, *Will Today's Environment Affect Vehicle Purchase Decisions for US Consumers?* (Dec. 6, 2023), https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/will-todays-environment-affect-vehicle-purchase-decisions-for-us-consumers.

prior rules. But EPA's scant discussion of reliance interests is inadequate and fails even to identify some of them.

EPA asked commenters to identify reliance interests, 91 Fed. Reg. at 28,475; but the Agency must identify them itself, and explain and weigh them against its new approach *in its Proposal.* Not doing so deprives the public of the ability to comment on what factual determinations EPA might make and what rationale it might advance to justify a final rule. *E.g.*, 91 Fed. Reg. at 28,475 (after asking *commenters* to identify reliance interests, EPA promises to determine only in the final rule "whether they are significant, and [to weigh] such interests against competing rationales"). The Proposal is patently insufficient. Should EPA, in a final rule, address reliance interests beyond the few paragraphs it has spared them here, the agency must first open a new comment period, which would then be the "first occasion" for "meaningful commentary." *Fertilizer Inst. v. EPA,* 935 F.2d 1303, 1311 (D.C. Cir. 1991) (a final rule is not a logical outgrowth of a proposal if it states new arguments and evidence).

1. EPA Fails to Properly Engage with Reliance Interests of Manufacturers of Cleaner Vehicles and Emissions Control Technologies.

The Agency's discussion of automakers' reliance interests spans less than a page. 91 Fed. Reg. at 28,475. EPA notes that many automakers and other businesses in the supply chain relied on the Tier 4 Standards' implementation by designing and building the vehicles and technologies required to comply, such as EVs which emit neither criteria pollutants nor air toxics and thus assist in meeting the standards, and ICE vehicles with installed ICE vehicle pollution control technologies needed to meet the prior standards. EPA notes that these companies "have already expended resources" in reliance on the 2024 Rule and that, if the Proposal becomes final, those resources might not be recouped. 91 Fed. Reg. at 28,475. The Agency opines that its changed position jeopardizing these interests "is necessary and supported by intervening developments that impact the analyses and assumptions used in the 2024 Tier 4 Rule and manufacturers' initial compliance planning in response thereto," and adds its belief that "the revisions proposed in this action relieve obligations in a manner that promotes compliance and cost savings without undermining existing investment in compliance." 91 Fed. Reg. at 28, 475. The Agency says nothing about the competitive disadvantage it would create for businesses that expended capital for compliance while others would avoid those costs.

This bit of circular reasoning does not constitute the explanation required for EPA's change of position, which must include a detailed examination and weighing of the underlying factors against one another. For instance, EPA never explores whether the proposed standard reduction is necessary to lower the standards even though averaging, banking, and trading of credits, available to automakers, is sufficient to smooth out the effects of the "intervening developments" EPA relies upon, and thus avoid the competitive disadvantages at issue, as averaging, banking and trading is designed to do. It does not consider whether the health and welfare and consumer harms caused by the standards is a sufficient reason to avoid creating reliance interest losses for automakers. And it does not explain the obvious contradiction between admitting, on one hand, that many automakers have already built vehicles in compliance with the Tier 4 Standards while asserting, on the other hand, that insufficient lead time to comply

necessitates the Proposal. In short, EPA has not explained why its Proposal is the better and more reasonable option and justifies the automakers' acknowledged reliance interest losses.

2. EPA Fails to Recognize States' Reliance Interests in Attaining and Maintaining the National Ambient Air Quality Standards.

EPA's Proposal impermissibly overlooks States' significant reliance interests in the Tier 4 Rule for purposes of meeting their National Ambient Air Quality Standards (NAAQS) obligations. EPA suggests parties "may have relied" on the MY 2027 start date for the Tier 4 Standards for reliance NAAQS compliance and planning obligations, and seeks to minimize such reliance interests by claiming that the foregone emission reductions associated with the Proposal are relatively small and that mobile-source standards "are just one of consideration among many involved in planning to attain the NAAQS and related obligations." 91 Fed. Reg. at 28,475. EPA completely fails to recognize, let alone address, that States *have* relied on the Tier 4 Standards as part of meeting their NAAQS compliance and planning obligations, and that the Proposal *will* significantly undermine such obligations.[112]

Namely, the latest release of EPA's own MOVES model, MOVES5, updated the previous version by accounting for the Tier 4 Standards. 89 Fed. Reg. at 99,862. EPA's MOVES modeling is a critical tool for States in developing their State Implementation Plans (SIPs), which set forth how a State will attain and maintain compliance with the life-saving NAAQS. For States with areas that are in NAAQS nonattainment, the Clean Air Act sets forth nonattainment SIP requirements that include certain modeling, emissions inventory, and other components, which States typically meet by utilizing the MOVES modeling platform and inputs. For example, Clean Air Act Section 182(c)(2)(A) requires that States with ozone nonattainment areas classified as Serious areas must submit a nonattainment SIP that includes an attainment demonstration based on photochemical grid modeling. 42 U.S.C. § 7511a(c)(2)(A). Additionally, Clean Air Act Section 172(c)(3) requires that all States with ozone nonattainment areas, regardless of their classification, must include in their nonattainment SIPs an emissions inventory of actual emissions from all sources of the relevant pollutant in the nonattainment area and that is "comprehensive, accurate, [and] current." 42 U.S.C. § 7502(c)(3).

States generally meet these nonattainment SIP requirements and others by using the most current version of MOVES. As EPA itself has stated, in part by citing Clean Air Act Section 172(c)(3)'s requirement that SIP inventories be based on the most current information and applicable models, "MOVES5 should be used in ozone, CO, PM, and nitrogen dioxide SIP development as expeditiously as possible, as there is no grace period for the use of MOVES5 in SIPs." 89 Fed. Reg. at 99,864. EPA's release of MOVES5 thus "engendered serious reliance interests that must be taken into account." *Encino Motorcars,* 579 U.S. at 222 (quoting *Fox Television*, 556 U.S. at 515). "It would be arbitrary and capricious to ignore such matters." *Id.* at 515, 129.

[112] As described further in subsection III-E *infra*, EPA in crafting the Proposal was aware of States and local governments' reliance interests in the Tier 4 Standards for the purposes of air quality planning; supporting materials in the docket for this rulemaking show that this issue arose during the interagency review process. *See* EPA-HQ-OAR-2025-3297-0054, Att. 11, at 1. Nonetheless, the Proposal arbitrarily fails to adequately explain or consider those significant interests.

Yet, EPA is precisely ignoring such matters. Particularly, States' nonattainment SIP obligations for the 2015 ozone NAAQS are ongoing. A significant number of areas are classified as Serious for the 2015 ozone NAAQS, and their nonattainment SIPs were due January 1, 2026. *See* 90 Fed. Reg. 5651 (Jan. 17, 2025). This deadline was established on January 17, 2025, after EPA released MOVES5 and indicated that States should use the updated modeling for ozone SIPs given the statute requires the use of current information for certain nonattainment plan elements. States have accordingly used MOVES5 in developing their Serious area nonattainment plans for the 2015 ozone NAAQS.[113] However, EPA's current proposal undercuts a major input and assumption in MOVES5, which again, was updated partly to account for the Tier 4 Standards.

Notably, EPA has not concurrently updated MOVES5 to reflect any weakening of these standards. SIPs that rely on modeling inputs and assumptions that inaccurately include since-repealed, delayed, or otherwise substantively altered measures are not approvable as meeting relevant Clean Air Act requirements, as these measures do not exist as a legal matter. For example, the validity of an emissions inventory projection or attainment demonstration that relies on certain emission reductions would be greatly distorted by a rollback of the regulations responsible for those reductions. EPA's own analysis for its Proposal shows there *will* be a resulting increase in NOx emissions, and EPA thus cannot rationally conclude that analyses that counterfactually include the emission reductions from the 2024 Rule still show compliance with the Clean Air Act's nonattainment SIP requirements for "accurate" and "current" emissions inventories, and for modeled attainment demonstrations.

EPA's disapproval of a nonattainment SIP or a State's failure to submit a nonattainment SIP carry serious statutory consequences, such as potential imposition of a Federal Implementation Plan and mandatory sanctions. EPA's weakening of the Tier 4 Standards would call into question the legal basis for approving SIPs that rely on these standards, including as part of the MOVES5 modeling, and States that have already missed their ozone nonattainment SIP deadlines may face further delay as they consider next steps in light of EPA's undercutting of its own modeling. EPA is thus "not writing on a blank slate" in implementing the 2015 ozone NAAQS, and proposing to weaken the Tier 4 Standards without at all addressing the impacts of such delay on the MOVES5 modeling and any nonattainment SIPs that rely on it is arbitrary and capricious. *Regents*, 591 U.S. at 32-33.

3. EPA Fails to Recognize the Reliance Interests of Consumers and the Public.

EPA says nothing at all about consumers' and the public's reliance interests in buying cleaner cars that emit less of the pollutants that damage their health and welfare.[114] This is a remarkable lapse in light of the central importance Congress placed on EPA's obligation to protect the public from the harm caused by air pollution. *See, e.g.*, *Massachusetts v. EPA,* 549

[113] *E.g.,* West Michigan Attainment State Implementation Plan Elements for the 2015 Ozone National Ambient Air Quality Standard Serious Element Attainment Demonstration at 20, submitted by the Department of Environment, Great Lakes, and Energy to EPA, *available at* https://www.michigan.gov/egle/about/organization/air-quality/state-implementation-plan/ozone-nonattainment.

[114] The entirety of EPA's discussion of reliance interests is found on less than one Federal Register page, 91 Fed. Reg. at 28,475.

U.S. 497, 532 (2007) (in Section 202(a), "EPA has been charged with protecting the public's 'health' and 'welfare'"). EPA's disregard of those interests is similarly reflected in how it discusses the extra pollution it creates in sections of the Proposal *not* concerned with reliance interests; there, it mischaracterizes its impact as "very small," 91 Fed. Reg. at 28,473; declines to model its air quality impact because to do so is allegedly "extremely difficult" and "very complex"; and deliberately skips any attempt to monetize these harms. 91 Fed. Reg. at 28,478. *See supra* subsection II-A-1-c.

EPA falls far short of its duty to provide what should have been a fulsome, science-backed discussion of the Proposal's air quality and health and welfare impacts and a monetization of those harms, including impacts on consumers no longer able to purchase cleaner vehicles. Instead, it provides a single, superficial paragraph about general pollution impacts untethered to the Proposal, throwing in two footnotes referring generally to the 2024 Rule and the 2024 Rule RIA documenting these harms *in support of* the 2024 Rule. 91 Fed. Reg. at 28,478 nn.66, 67. The 2024 Rule's analysis, which does contain the extensive scientific and evidence-based analysis needed to undergird the current Tier 4 Standards, obviously cannot substitute for EPA's duty here to perform new and *even more* detailed modeling and harm assessment of the Proposal itself to overcome its prior contrary record and explain its decision to reduce the Tier 4 Standards. *See State Farm,* 463 U.S. at 53. EPA entirely fails the *State Farm* test.

The Agency overlooks consumers' reliance interests in purchasing less polluting vehicles in particular, saying nothing on the matter.[115] In fact, many consumers look for and wish to purchase the less polluting vehicles manufacturers build due to increasingly stringent rules, and some delay their purchases into later model years expecting cleaner vehicles in a variety of models to come on the market.[116] These consumers would now be unable to rely on the benefits cleaner vehicles provide as, under EPA's assumptions, MY 2027 and 2028 vehicles will be just as polluting as MY 2026 vehicles, a serious foregone reliance interest that keeps cleaner vehicles from coming to market. To support the Proposal, EPA asserts that numerous recent policy choices and initiatives have "contributed to a change in consumer demand and production choices," 91 Fed. Reg. at 28,466-67. But EPA does not acknowledge that (a) many of those changes, aimed at reducing the production of EVs and other cleaner vehicles, are the result of EPA's own doing, and (b) the Proposal would result in even fewer of the cleaner vehicles consumers want to buy. EPA displays no awareness that those changes and the lost diversity in future clean vehicle models represent serious lost reliance interests that it must weigh in the rulemaking process.

[115] *E.g.,* McKinsey & Company, *supra,* https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/will-todays-environment-affect-vehicle-purchase-decisions-for-us-consumers; Jupiter Chevron, *Why More Consumers Are Prioritizing Environmental Impact When Buying Cars* (May 28, 2025), https://www.jupiterchev.com/blogs/6872/why-more-consumers-are-prioritizing-environmental-impact-when-buying-cars; Nat'l Library of Medicine, *The Relationship Between Air Quality, Health Outcomes, and Socioeconomic Impacts of the COVID-19 Pandemic in the U.S.* (May 10, 2023), https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2022GH000735; Nat'l Library of Medicine, *The Green Light on Buying a Car: How Consumer Decision-Making Interacts Environmental Attributes in the New Vehicle Purchase Process* (Jan. 24, 2024), https://pmc.ncbi.nlm.nih.gov/articles/PMC10807243/pdf/nihms-1934216.pdf.

[116] *See McKinsey & Company, supra*.

C. EPA Fails to Consider Reasonable Alternatives to a Full Delay of the Tier 4 Program.

The Proposal's failure to meaningfully consider reasonable alternatives is arbitrary and capricious. Agencies are required to consider "significant and viable and obvious alternatives" to their proposed action. *Dist. Hosp. Partners, L.P. v. Burwell*, 786 F.3d 46, 59 (D.C. Cir. 2015); *see Spirit Airlines, Inc. v. DOT*, 997 F.3d 1247, 1255 (D.C. Cir. 2021) ("[T]he failure of an agency to consider obvious alternatives has led uniformly to reversal." (internal quotations omitted)); *Ky. Mun. Energy Agency v. FERC*, 45 F.4th 162, 188 (D.C. Cir. 2022) (finding FERC's lack of consideration of an alternative "amounts to failure of reasoned decisionmaking"). Courts have repeatedly affirmed the need to consider alternatives, particularly where an agency is reversing a prior action. *See, e.g.*, *State Farm*, 463 U.S. at 51 (finding that NHTSA had arbitrarily failed to explain its rejection of option requiring airbags despite its prior finding "that airbags are an effective and cost-beneficial life-saving technology"); *Pub. Citizen v. Steed*, 733 F.2d 93, 100 (D.C. Cir. 1984) (setting aside suspension of rule because NHTSA "failed to explain why alternatives, which the rulemaking record indicates were available to the agency, could not correct" problem agency relied on as basis for suspending rule); *Delaware Dept. of Nat. Res. & Env't Control v. EPA*, 785 F.3d 1 (D.C. Cir. 2015) ("alternative way of achieving EPA's objective ... should have been addressed and adequate reasons given for its abandonment"); *Shieldalloy Metallurgical Corp. v. NRC*, 624 F.3d 489 (D.C. Cir. 2010) ("[A]gencies must evaluate parties' proposals of 'significant and viable' alternatives.") (citing *Farmers Union Cent. Exch., Inc. v. FERC*, 734 F.2d 1486, 1511 n.54 (D.C. Cir. 1984)). Moreover, an agency cannot broadly invoke the alleged defects of one aspect of a regulation to justify its repeal of the entire regulation, especially where the agency has viable alternatives. *See Regents*, 591 U.S. at 28–31.

Here, EPA has failed to consider *any* alternatives to a full two-year "delay" that increases emissions, despite there being numerous "significant and viable and obvious alternatives" to the Proposal. *Dist. Hosp. Partners*, 786 F.3d at 59. This failure raises the question of whether the Proposal is simply an attempt to eliminate the Tier 4 Standards for near-term model years while EPA considers whether to amend the program, rather than a genuine attempt to provide a smoother regulatory pathway. Although, for the reasons laid out above, EPA should not move forward with the Proposal—and although any alternatives that violate Clean Air Act Section 202(b)(1)(C)'s anti-backsliding prohibition or retroactively revise standards for a model year that has already commenced are unlawful, *see supra* subsections I-A & I-B—EPA was still required to consider at least the following alternatives to the Proposal beyond taking no action.

First, EPA failed to consider less drastic emission increases—an obvious alternative that would have achieved EPA's goals with far less disruption to reliance interests and harms to human health and the environment. For example, EPA could have imposed its stringency reduction only for MY 2027—assuming it had the statutory authority to do so, *but see supra* subsection I-A—since there is ample time for manufacturers to comply with the MY 2028 standards. Indeed, as we explain above, manufacturers have had sufficient lead time to comply with the MY 2027 standards—let alone MY 2028 standards. But even putting that aside, EPA itself asserts that "industry practices … indicate a year to 18 months would be necessary to adjust production plans." 91 Fed. Reg. 28,467. This leaves plenty of time for manufacturers to adjust plans for MY 2028. Assuming (implausibly) that manufacturers have not already been planning

for MY 2028 compliance, a year to 18 months from the proposal is still comfortably within the MY 2028 certification period. EPA had an obligation to consider this reasonable alternative.

Second, EPA should have considered a modification to the Tier 4 Standards that reflects what EPA considers to be achievable standards—based on the prevalence of emission control technologies with various non-BEV powertrains—rather than simply delaying the Tier 4 rule in its entirety. The Proposal rests on the false premise that any standard beyond Tier 3 would be unachievable in MYs 2027 and 2028. As explained above, however, feasible technology to meet the Tier 4 Standards not only exists but also is deployed on many vehicles already being sold. Indeed, as EPA admits, "some companies have certified Tier 4 vehicles for MY 2027." 91 Fed. Reg. 28,473. In addition, manufacturers can utilize credits and trading to make up any deficits. For these and other reasons described above, the standards are achievable. But at the very least, it is clear that manufacturers can meet a standard at least somewhat more stringent than the Tier 3 Standards—and that manufacturers have made investments to do so, in reliance on the Tier 4 Standards. Yet EPA made no efforts to quantify or estimate what percentage of vehicles could comply with the MY 2027 or 2028 Tier 4 Standards, or what the fleetwide averages for NMOG+NOx might be for those years. Despite already having some compliance data for MY 2027, EPA pleads ignorance, stating "the product mix and sales volume for MY 2027 are unknown and thus the impacts on NMOG+NOX fleet averages are unknown." *Id.* Through a request for information and its ongoing regulatory oversight, however, EPA could have gleaned even more information about how far off (if at all) manufacturers' fleets are from compliance with the Tier 4 Standards.[117] Moreover, EPA likely has much of the information it needs because any manufacturer wishing to sell a covered vehicle before the Proposal is finalized is required to certify to the Tier 4 Standards, and any application for certification for a vehicle must contain information about the manufacturer's compliance plans, including testing data and expected sales. See, e.g., 40 C.F.R. §§ 86.1829-15, 86.1843-01, 86.1844-01. In sum, EPA could have—and reasonably should have—considered setting an intermediary standard between Tier 3 and Tier 4 for MYs 2027 and 2028, rather than simply rolling back to the Tier 3 Standards.

Finally, EPA also failed to consider an alternative of maintaining the MY 2027 and 2028 Tier 4 Standards for light-duty vehicles with GVWR between 6,001 and 8,500 pounds and for MDVs. As EPA acknowledges, "these heavier light-duty vehicles and the MDVs already have a compliance schedule that does not require meeting the Tier 4 Standards in either MY 2027 or MY 2028." DRIA at 1-3. The only practical impact of the Proposal on these vehicle classes is therefore to eliminate the first two years of the early phase-in pathway, whereby manufacturers could voluntarily meet more stringent requirements in these two years. Eliminating this pathway increases air pollution and penalizes manufacturers that have already made investments relying on this regulatory flexibility—with no demonstrable benefits, since manufacturers that choose not to use this pathway face no increased burden in MYs 2027 or 2028. Indeed, EPA declined to estimate costs for heavy-duty vehicles for this very reason. *See id.* For all of these reasons, an obvious alternative that EPA should have meaningfully considered was to leave the Tier 4 Standards in place for heavier light-duty vehicles and MDVs. *See Regents*, 591 U.S. at 28–31

[117] EPA acknowledges that information it receives as part of this rulemaking could cause it to reevaluate the proper standard, but only "to determine whether an additional extension of Tier 3 may become necessary (*e.g.,* an extension to MY 2029)." 91 Fed. Reg. at 28,473. The Agency never considers that the data might demonstrate a more stringent standard is appropriate—only the opposite.

(holding agency acts in arbitrary and capricious manner when it repeals a regulation in its entirety but alleged defects only apply to one aspect of the rule).

These failures, individually and collectively, render the Proposal arbitrary and capricious.

III. The Proposal Is Procedurally Deficient.

As described below, EPA's rulemaking process fails to comply with basic procedural requirements of the Clean Air Act, the APA, and multiple executive orders. EPA has denied stakeholders an adequate and meaningful opportunity to engage in this consequential rulemaking process, as well as the consultation and analysis guaranteed by executive order. Those process failures prejudice the public, including the undersigned public interest organizations and our members, who have significant interest in full and timely implementation of the Tier 4 Standards. The only way for EPA to remedy these myriad procedural infirmities would be to withdraw the Proposal.

A. EPA Has Violated Section 307(d)'s Docketing Requirements by Failing to Publicize Essential Data and Otherwise Has Not Provided an Adequate Notice-and-Comment Opportunity.

EPA's factual assertions, findings, and conclusions in the Proposal rely on light- and medium-duty vehicle emissions information—including compliance data, certification reports, and production data—that are within EPA's possession and control. *See, e.g.,* DRIA at 1-2 (referencing EPA tracking the "trading of NMOG+NOX credits between companies during the Tier 3 program" and the prospect that "companies who have banked credits may use those credits in MYs 2027 and 2028"); EPA-HQ-OAR-2025-3297-0059, Att. 2. But EPA has declined to include that information in its rulemaking docket or otherwise make it available to the public. Such information is critical, for instance, for public commenters to be able to evaluate the progress to date made by automakers in complying with the Tier 3 and 4 Standards, and to evaluate the alleged feasibility and lead time concerns that EPA claims to address with its Proposal. By failing to timely docket this information, EPA has violated the Clean Air Act's requirement that "[a]ll data, information, and documents … on which the proposed rule relies shall be included in the docket on the date of publication of the proposed rule." 42 U.S.C. § 7607(d)(3); *see also id.* § 7607(d)(3)(A) (requiring EPA to publish "a summary of… the factual data on which the proposed rule is based"); *id.* § 7607(d)(6)(C) ("[A] promulgated rule may not be based (in part or whole) on any information or data which has not been placed in the docket as of the date of such promulgation.").

By continuing to withhold the vehicle emissions information underlying its Proposal, EPA has also deprived the public of adequate notice of the Proposal and a meaningful opportunity to comment on its substance, and thereby committed additional, arbitrary, and serious procedural error. *See* 5 U.S.C. § 553(c); *see also, e.g.*, *Gerber v. Norton*, 294 F.3d 173 (D.C. Cir. 2002) ("Th[e] opportunity for comment must be a meaningful opportunity."). To meet the legal standard of adequate notice and a meaningful comment opportunity, an agency must "identify and make available technical studies and data that it has employed in reaching the decisions to propose particular rules." *Solite Corp. v. EPA*, 952 F.2d 473, 484 (D.C. Cir. 1991). The D.C. Circuit has confirmed that "[a]n agency commits serious procedural error when it fails to reveal portions of the technical basis for a proposed rule in time to allow for meaningful

commentary." *Id.* (citation omitted); *see also Chamber of Com. of U.S. v. SEC*, 443 F.3d 890, 900 (D.C. Cir. 2006) ("the 'most critical factual material' used by the agency [must] be subjected to informed comment"). In failing to publicize, for the entirety of this comment period, necessary vehicle emissions information on which EPA clearly relied in crafting the Proposal, EPA has deprived the public of a meaningful comment opportunity.[118]

Despite ample opportunity to mitigate prejudice to the public from this critical error in its rulemaking process, EPA has refused to do so. EPA received repeated calls from the public to publish the vehicle emissions information on which the Proposal relies and to extend the comment period appropriately to ensure the public would have reasonable opportunity to submit comments concerning that information and its bearing on the Proposal. On May 21, 2026—only three days after the Proposal was published—Environmental Defense Fund submitted to EPA a Freedom of Information Act (FOIA) request seeking information regarding vehicle manufacturers' compliance with existing emissions standards and other data that is essential for the public to meaningfully evaluate and comment on the Proposal. *See* EPA-HQ-OAR-2025-3297-0059, Att. 2 (Case No. 2026-EPA-05129).

In addition, multiple parties—including public interest organizations, state attorneys general, an industry group, and others—filed requests for an extension of the Proposal's comment period,[119] including a request by many of the undersigned public interest organizations to extend the comment period to at least 30 days after public release of the requested vehicle emissions information, and to at least 60 days in total. But EPA declined those extension requests.

Because EPA's arbitrary procedural violations have significantly prejudiced the public, incurably tainted this rulemaking process, and would render any final rule unlawful, *see* 42 U.S.C. § 7607(d)(9)(D), EPA should immediately withdraw the Proposal.[120]

B. EPA Failed to Comply with the Endangered Species Act.

EPA violated the Endangered Species Act (ESA) by failing to conduct an effects determination and failing to consult under Section 7 of the ESA. When an agency carries out a non-ministerial action that may affect federally listed threatened or endangered species, or their critical habitats, Section 7 requires consultation with the U.S. Fish & Wildlife Service and/or National Marine Fisheries Service. The threshold for determining that an action "may affect" a

[118] And as stated above, to the extent that EPA did not consider this relevant information that is plainly in its control, that failure renders the Proposal arbitrary and capricious, including because EPA has failed to consider an important aspect of the problem. *See State Farm*, 463 U.S. at 43.

[119] *See* EPA-HQ-OAR-2025-3297-0059 (Environmental Defense Fund et al.); EPA-HQ-OAR-2025-3297-0061 (Environmental Protection Network); EPA-HQ-OAR-2025-3297-0090 (Paul G. Billings); EPA-HQ-OAR-2025-3297-0062 (Attorneys General of New York et al.); EPA-HQ-OAR-2025-3297-0063 (Manufacturers of Emission Controls Ass'n).

[120] *See also, e.g.*, Admin. Conf. of the United States, Rulemaking Comments (2011), https://www.acus.gov/document/rulemaking-comments (recommending, for significant regulatory actions like the Proposal, that "agencies should use a comment period of at least 60 days"); Exec. Order 13563, § 2(b) ("To the extent feasible and permitted by law, each agency shall afford the public a meaningful opportunity to comment … on any proposed regulation, with a comment period that should generally be at least 60 days.").

listed species is very low, and it is clearly met here where EPA predicts NOx increases in every year through 2055, summing to an additional 18,548 tons of NOx emissions through 2055. DRIA at 2A-3 (sensitivity cases).

The DRIA explains that:

> the proposal would result in changes in emissions of pollutants that contribute to ambient concentrations of PM2.5, ozone, NO2, and air toxics. There are a broad range of health risks and welfare effects associated with exposure to these pollutants … *including ecosystem effects.*

DRIA at 2-6 (emphasis supplied); *see also id.* at 2-5–2-6 ("EPA expects that in areas close to roadways (i.e., within 300–600 meters of the roadway), the increased vehicle emissions could increase ambient levels of PM2.5, NO2, and other traffic related pollutants."). NOx pollution, for example, has been shown to harm listed species like the federally threatened bay checkerspot butterfly, the Mojave Desert tortoise, the Florida manatee, and several species of freshwater mollusks. These species and their highway-adjacent critical habitats may also be adversely affected by the Proposal, and thus, consultation under the ESA is required.

1. EPA Must Complete ESA Consultation Because the Proposal May Affect Listed Species or Critical Habitats.

Section 7 of the ESA requires a federal agency (here, EPA) to complete formal consultation with the U.S. Fish and Wildlife Service or the National Oceanic and Atmospheric Administration (depending on the location of the species) if the agency determines that any action on its part "may affect" any listed species or critical habitat.

"'May affect' purposefully sets a low bar: 'Any possible effect, whether beneficial, benign, adverse or of an undetermined character, triggers the formal consultation requirement.'" *Growth Energy v. EPA*, 5 F.4th 1, 30 (D.C. Cir. 2021) (citing 51 Fed. Reg. 19,926, 19,949 (June 3, 1986)); *see also Karuk Tribe of Cal. v. United States Forest Serv*., 681 F,3d 1006, 1027 (9th Cir. 2012); *Northern Plains Res. Council v. United States Army Corps of Engr's*, 454 F.Supp.3d 985 (D. Mont. 2020). In carrying out the consultation process, agencies must use the "best scientific and commercial data available" to fulfill the requirements of the ESA. 16 U.S.C. § 1536(a)(2). Only if the federal agency finds that its proposed action "will not affect any listed species or critical habitat in any way"—that is, makes a "no effect" determination—can it skip the consultation process. *In re Ctr. for Biological Diversity & Ctr. for Food Safety*, 53 F.4th 665, 668 (D.C. Cir. 2022).

2. Scientific Evidence Clearly Shows That the Proposal Will Adversely Affect Federally Listed Species, Including Causing Adverse Modification of Critical Habitat and Jeopardy for Some Species.

Fossil-fuel combustion from vehicles produces NOx air pollutants, including nitrous oxide (N2O), as well as nitric acid (HNO3), nitrate (NO3-), and ammonia (NH3), which have contributed to a significant increase in nitrogen deposition in many parts of the United States, resulting in widespread impacts to species and ecosystems. The Proposal would increase NOx

emissions from vehicle exhaust, thereby increasing nitrogen deposition in the areas where covered vehicles operate, with resulting harms to listed species and their critical habitat.

Scientific research has clearly established linkages between NOx emissions and harms to federally listed species. A review of the effects of nitrogen pollution on ESA-listed species, based on analysis of U.S. Fish and Wildlife Service and National Marine Fisheries Service documents, found that this threat is "substantial" and "geographically widespread."[121] This review, Hernandez et al. (2016), identified evidence for harm from nitrogen pollution for at least 78 federally listed taxa. This includes 50 invertebrates such as mollusks and arthropods, 18 vertebrates such as fish, amphibians, and reptiles, and 8 plants. Harms from nitrogen pollution fell into four main categories: (1) direct toxicity or lethal effects of nitrogen, (2) eutrophication lowering dissolved oxygen levels in water or causing algal blooms that alter habitat by covering up substrate, (3) nitrogen pollution increasing non-native plant species that directly harm a plant species through competition, and (4) nitrogen pollution increasing non-native plant species that indirectly harm animal species by excluding their food sources.

In its 2020 Integrated Science Assessment for Oxides of Nitrogen, Oxides of Sulfur and Particulate Matter, EPA identified 14 ways in which NOx pollution has been shown to have a "causal relationship" to ecological effects, based on a review of the science.[122] Similar to Hernandez et al. (2016), EPA stated that the causal effects of NOx pollution include direct phytotoxic effects, acidification, eutrophication, and changes to physiology, growth, species richness, community composition, and biodiversity.

Nitrogen deposition from vehicle pollution is a well-documented harm to listed species. For the bay checkerspot butterfly (Euphydryas editha bayensis), which is restricted to patches of low-nutrient serpentinite soil in the San Francisco Bay area, nitrogen deposition from vehicles has allowed exotic grasses to replace native forbs, including replacing the bay checkerspot's larval host plant and adult nectar sources. NOx pollution has contributed to butterfly population declines and local extirpations. The bay checkerspot population at Edgewood Natural Preserve adjacent to 8-lane Highway 280 was extirpated when non-native plants over-ran larval host plants up to approximately 400 meters from the highway, leading to the loss of 80% of the available habitat. The U.S. Fish and Wildlife Service in its 5-year review for the bay checkerspot found that the level of impact from nitrogen deposition increased with proximity to a major interstate highway.

Similarly, the Fish and Wildlife Service has determined that nitrogen deposition threatens the federally protected Quino checkerspot butterfly (Euphydryas editha quino) and the desert tortoise (Gopherus agassizii) by facilitating the spread of non-native species that displace the butterfly's host plants and the tortoise's forage plants, reducing the nutritional quality of available food for these species. The Florida manatee is also affected by excessive nitrogen deposition allowing micro-algae to out-compete the manatee's natural food sources.

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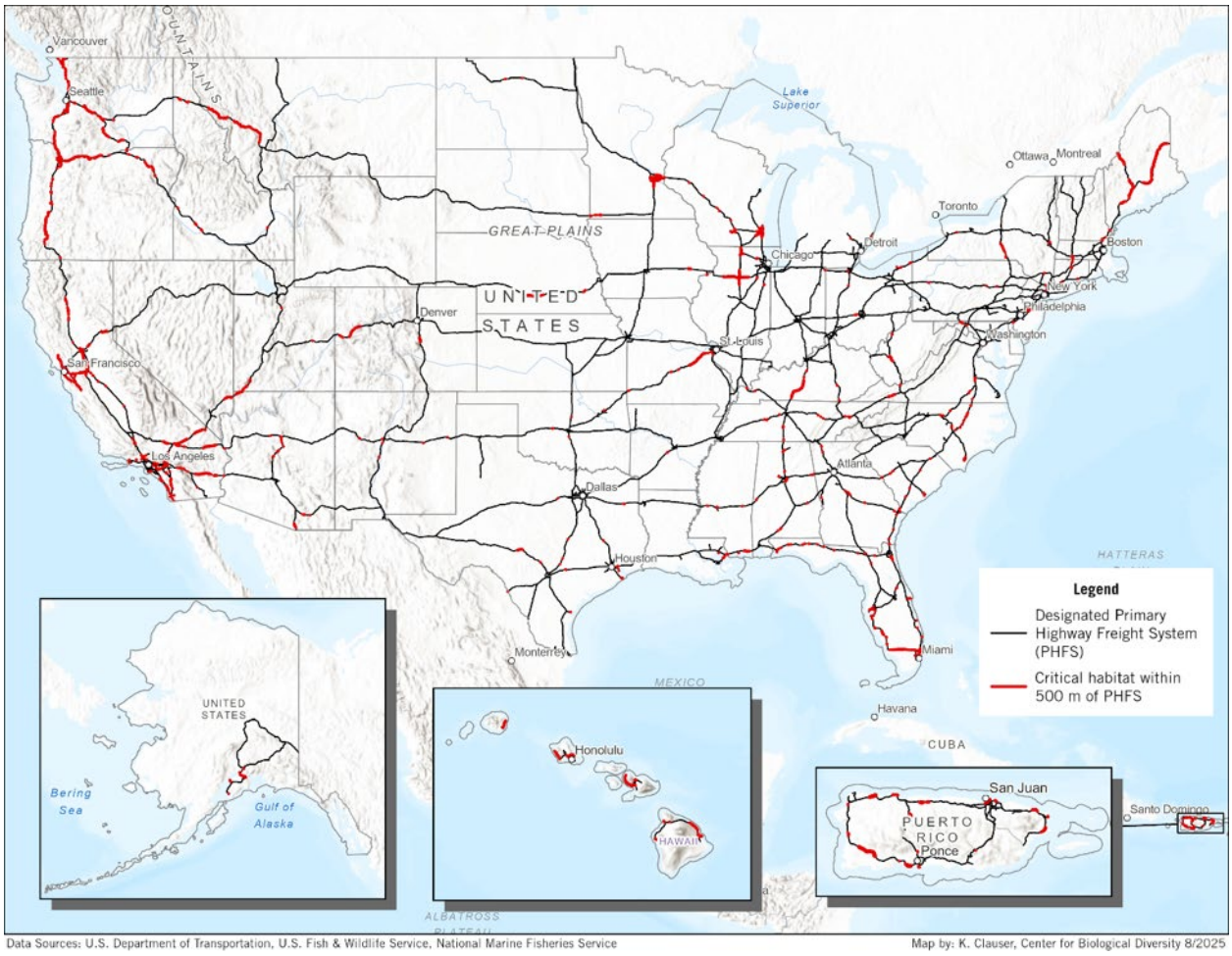
[121] Daniel L. Hernandez et al., *Nitrogen Pollution Is Linked to US Listed Species Declines*, 66 BioScience 213 (2016), https://academic.oup.com/bioscience/article-abstract/66/3/213/2468675?redirectedFrom=fulltext.

[122] EPA, *Integrated Science Assessment for Oxides of Nitrogen, Oxides of Sulfur and Particulate Matter – Ecological Criteria* at IS-22–IS-24, tbl.IS-1 (2020), https://assessments.epa.gov/isa/document/&deid=349473.

EPA's Proposal will result in vast amounts of additional NOx emissions over the decades during which these higher-polluting vehicles will continue to be on the road, harming nearby species with NOx from their exhaust. We estimate that 249 federally listed species (including subspecies and DPSs) have critical habitat within 500 meters of a national highway freight corridor, as shown in Figure 1 below, and may be affected by the increased NOx emissions from vehicle tailpipes resulting from the Proposal.

Figure 1



3. The Proposal Will Result in an Irreversible Commitment of Resources.

Finalization of the Proposal would be an irreversible or irretrievable commitment of resources within the meaning of ESA Section 7(d) because vehicles built without the protections of current law, expected to be on the road for decades, will emit more NOx and other criteria pollutants into the atmosphere than they would under the status quo. These increases in NOx levels will persist until at least 2055 by EPA's own estimates.

Maintaining the status quo is an important rationale for Section 7(d). As EPA Region VI has explained:

> Section 7(d) of the ESA requires that, after initiation of consultation under Section 7(a)(2), a federal agency "shall not make any irreversible or irretrievable commitment of resources with respect to the agency action which has the effect of foreclosing the formulation or implementation of any reasonable and prudent alternative measures which would not violate subsection (a)(2) of this section." In other words, any action taken prior to completion of consultation must not interfere with the ability of the agency to implement reasonable and prudent measures determined to be necessary to avoid jeopardy to a protected species or adverse effects to its critical habitat. Section 7(d) of the ESA is a preventative measure designed to ensure that the status quo is preserved during the consultations process and clarifies the requirements of Section 7(a). *Conner v Burford*, 848 F.2d. 1441 (9th Cir 1988).[123]

Here, the status quo is the protection from harm that the current Tier 4 Standards provide. Eliminating that protection will lead to decades of excessive air pollution that will harm endangered species and their habitats.

C. EPA's Rulemaking Process Fails to Comply with Multiple Executive Orders and the Regulatory Flexibility Act.

A separate but related deficiency is EPA's failure to comply with multiple applicable executive orders by either incorrectly concluding that a given executive order does not apply, or—where it acknowledges applicability—failing to satisfy the substantive analytical and consultation requirements.

First, EPA baldly asserts that Executive Order 13132, which concerns respect for federalism and consultation with the States, does not apply because "[t]his action does not have federalism implications. It will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government." 91 Fed. Reg. at 28,479. Each of those assertions is clearly contradicted by the new policies the Agency proposes—which have overt implications for federalism—and by the Agency's own acknowledgment of the impact on states' reliance interests. *See* 91 Fed. Reg. at 28,475 ("[T]he EPA understands that . . . the proposed rule could conceivably have implications for State departments of transportation and metropolitan planning organizations."). The Proposal substantially affects States' practical ability to abate criteria pollutant emissions and to achieve attainment under the NAAQS.[124] States without

[123] EPA Memorandum, EPA Region VI Endangered Species Act Section 7(d) Determination Relating to Issuance of NPDES General Permit for Offshore Oil and Gas Operations in the Western Gulf of Mexico (NPDES No. GMG290000) (Aug. 29, 2017), *available at* https://www.epa.gov/sites/default/files/2017-09/documents/memo_to_file_-_esa_section_7d_determination.pdf.

[124] States are preempted from adopting or enforcing independent emissions standards for new motor vehicles; however, EPA must grant California a waiver of that preemption upon certain showings, and other states can choose to adopt California's more stringent standards in lieu of the federal standards. 42 U.S.C. §§ 209(a)-(b), 177.

independent regulatory authority rely on federal standards to make progress toward NAAQS attainment and to ameliorate localized air pollution; when the EPA weakens those standards, States are forced to identify more costly and difficult means of achieving necessary emissions reductions.

The Proposal also has more granular consequences. Criteria pollutants affect air quality at the local level. States, particularly those with regions in NAAQS nonattainment, design air quality management plans and SIP obligations around emissions reductions projected to flow from the Tier 4 Standards. Delaying anticipated reductions from Tier 4 implementation directly burdens state and local governments by undermining SIP compliance projections. *See supra* subsection II-B-2 (discussing State and municipality reliance on Tier 4 Standards in attaining and maintaining NAAQS). Although noting the existence of State reliance, EPA provides no assessment of the Proposal's disruption of State compliance obligations, instead succinctly concluding that "mobile-source standards are just one consideration among many involved in planning to attain the NAAQS and related obligations." 91 Fed. Reg. at 28,475.

Second, EPA acknowledges that Executive Order 13045—which requires agencies to protect children from environmental health risks—applies, but the Agency does not fully catalog the disproportionate risks that criteria pollutants pose to children and fails to satisfy the Order's central substantive requirement. Per EPA's own summary of the Order, when promulgating a qualifying rule, "EPA must evaluate the effects of the planned regulation on children and explain why the regulation is preferable to potentially effective and reasonably feasible alternatives."[125] The 2024 Rule documented significant projected health benefits to children from the Tier 4 Standards, including reductions in pediatric asthma attacks, hospital admissions, and premature deaths. *See* 89 Fed. Reg. at 27,842. EPA fails to acknowledge that these projected health benefits become foregone benefits under a two-year delay in the proposal, nor does the Agency explain why the two-year delay is preferable to other reasonably feasible alternatives—such as retaining existing compliance timelines. EPA's partial acknowledgment of the Proposal's disproportionate risks to children without any explanation of why the proposed course of action is preferable to alternatives fails to comply with the substantive requirements of the Order.

Third, Executive Order 13211 concerns significant regulatory actions that are likely to have a substantial adverse effect on the supply, distribution, or use of energy. EPA asserts that the Order does not apply because the Proposal "is not a significant regulatory action under Executive Order 12866." 91 Fed. Reg. at 28,480. This conclusion directly contradicts EPA's own determination on the preceding page that "[t]his action is an economically significant regulatory action as defined under section 3(f)(1) of Executive Order 12866." *Id.* at 28,479. After conceding that the Proposal clears the threshold of significance under Executive Order 12866, EPA cannot then disclaim that same significance to avoid the analytical obligations of Executive Order 13211. Under the Order, an agency must explain any adverse effects on energy supply, distribution, or use and reasonable alternatives—whenever it proposes a significant regulatory

[125] *See* EPA, Summary of Executive Order 13045: Protection of Children from Environmental Health Risks and Safety Risks, https://www.epa.gov/laws-regulations/summary-executive-order-13045-protection-children-environmental-health-risks-and (last updated Feb. 23, 2026).

action "likely to have a significant adverse effect on the supply, distribution, or use of energy." Exec. Order No. 13,211, § 4, 66 Fed. Reg. 28,355 (May 22, 2001).

Finally, EPA concludes that the Regulatory Flexibility Act, which requires agencies to consider the effects of their proposed regulations on small businesses and entities, does not apply to the Proposal "because the rule relieves regulatory burden on the small entities subject to the rule." 91 Fed. Reg. at 28,479. This justification is flawed because EPA fails to consider the impact of the Proposal on small manufacturers of light- and medium-duty vehicles and parts manufacturers for GPFs, catalysts, and other pollution control technologies.[126]

D. To the Extent EPA Relies on Artificial Intelligence in This Action, the Failure to Disclose That Use Violates Applicable Procedural Requirements.

EPA must disclose whether and how it has used artificial intelligence (AI) in this rulemaking. Specifically, if AI has been used, EPA must describe the AI tools employed and explain how the Agency has used them, including EPA's inputs and the AI tool's outputs.[127] AI can be used appropriately to improve agency efficiency, but its use must be properly moderated and disclosed.

Under the Clean Air Act, EPA is required to accompany its proposed rule with a statement of the rule's basis and purpose. 42 U.S.C. § 7607(d)(3). To be lawful, the Agency must "articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.'" *State Farm*, 463 U.S. at 43 (quoting *Burlington Truck Lines, Inc. v. United States*, 371 U.S. 156, 168 (1962)) The Agency cannot "rel[y] on factors which Congress has not intended it to consider" or "entirely fail[ ] to consider an important aspect of the problem." *Id.* at 43. Nor can it "offer[ ] an explanation for its decision that runs counter to the evidence before the agency." *Id.* The Agency's decision must be "justified by the rulemaking record." *Id.* at 42.

If artificial intelligence is used to generate data, analyze data, or otherwise execute data-processing tasks in the course of EPA's rulemaking, it constitutes a basis used to generate the rule. Therefore, any use of AI to construct the Proposal must be disclosed. Any final rule will similarly be required to disclose any use of AI in the methodology behind the rule. These requirements safeguard against potential errors during rulemaking by providing the public an opportunity to identify and correct such errors. To the extent EPA has used AI in the Proposal—or intends to use it in the final rulemaking—and has failed to disclose that use in the rule's

[126] Moreover, in the 2024 Rule, EPA found that the Tier 4 Standards did not significantly impact small entities largely because small-entity vehicle manufacturers in the regulated space exclusively produce electric vehicles, which do not have a criteria pollutant component. *See* 89 Fed. Reg. at 28,069. If the Tier 4 Standards imposed no meaningful compliance burden on small entities, then weakening those standards cannot confer a meaningful benefit. EPA's invocation of a blanket presumption in favor of deregulation is not a substitute for reasoned justification and analysis.

[127] For a more fulsome list of questions EPA should answer in disclosing its AI use, *see* Governing for Impact, *AI in Agency Rulemaking: Legal Guardrails Issue Brief* at 16 (July 2025), https://governingforimpact.org/wp-content/uploads/2025/07/AI-in-Agency-Rulemaking_Legal-Guardrails.pdf.

statement of basis and purpose, it removes those safeguards in violation of its statutory obligations.

Additionally, reliance on AI for information or data in any part of the rulemaking must be disclosed as the Agency's decision must be "justified by the rulemaking record," *State Farm*, 463 U.S. at 43, and a failure to disclose AI use would result in an incomplete record for judicial review. Courts have declared that these disclosures are "the safety valves in the use of ... sophisticated methodology." *Sierra Club v. Costle*, 657 F.2d 298, 334 (D.C. Cir. 1981). These disclosures are necessary to ensure that agency AI adoption remains open to both public inspection and judicial review. If EPA has used AI in this rulemaking and fails to disclose it in the docket, it hides potential errors and biases from public view.

Moreover, any undisclosed use of AI could render EPA's rule unlawful. When an agency uses computer models to formulate a proposed rule, the Agency "must explain the assumptions and methodology used in preparing the model." *U.S. Air Tour Ass'n v. FAA*, 298 F.3d 997, 1008 (D.C. Cir. 2002) (quoting *Small Refiner Lead Phase–Down Task Force v. EPA*, 705 F.2d 506, 535 (D.C. Cir. 1983)). These explanations ensure that the "ultimate responsibility for the policy decision remains with the agency rather than the computer." *Sierra Club*, 657 F.2d at 334-35. Therefore, agencies using AI should disclose, at a minimum, "algorithmic specifications, including the objective function being optimized, the method used for that optimization, and the algorithm's input variables." Cary Coglianese & David Lehr, *Regulating by Robot: Administrative Decision Making in the Machine-Learning Era*, 105 Geo. L. J. 1147, 1208 (2017).

In addition to statutory requirements, recent executive branch directives require AI-use disclosure. The executive actions reflect the Administration's understanding that agency AI disclosure is necessary for correcting agency errors and shortcomings, in addition to building public trust. For example, the Office of Management and Budget requires in OMB Memo M-25-21 that when an agency uses AI, the agency must "publicly release a summary describing" whether its use is "high-impact."[128] If EPA's rule uses potentially high-impact AI, EPA must follow several additional requirements outlined in OMB Memo M-25-21, app. 4. These requirements include, but are not limited to, ensuring that "individuals affected by AI-enabled decisions have access to a timely human review and a chance to appeal any negative impacts, when appropriate." *Id.* at 17. Even if EPA does not use high-impact AI, the Memo recommends that EPA maintain a "transparent process that seeks public input, comments, or feedback from the affected groups in a meaningful, accessible, and effective manner" regarding AI use.[129]

[128] Office of Mgmt. & Budget, Exec. Office of the President, Memorandum M-25-21, Accelerating Federal Use of AI through Innovation, Governance, and Public Trust (Apr. 3, 2025). This document defines "high-impact" as follows: "AI is considered high-impact when its output serves as a principal basis for decisions or actions that have a legal, material, binding, or significant effect on rights or safety."

[129] *Id.* at 24. These OMB guidelines for federal agencies also reflect country-wide efforts to increase AI oversight and disclosure in government. In 2024 alone, 12 laws regulating public sector uses of AI were passed by state legislatures and over 40 bills were introduced. Quinn Anex-Ries, *Regulating Public Sector AI: Emerging Trends in State Legislation*, Ctr. for Democracy & Tech. (Jan. 10, 2025), https://cdt.org/insights/regulating-public-sector-ai-emerging-trends-in-state-legislation/; *see also* OMB Circular A-4 (asking for transparency in regulatory analysis, "[agencies] should clearly set out the basic assumptions, methods, and data underlying the analysis").

These OMB guidelines are consistent with key executive action from the first Trump administration. In his December 2020 Executive Order, "Promoting the Use of Trustworthy Artificial Intelligence in the Federal Government," President Trump acknowledged that "the ongoing adoption and acceptance of AI will depend significantly on public trust," and required agencies to "design, develop, acquire, and use AI in a manner that fosters public trust." Exec. Order No. 13,960, 85 Fed. Reg. 78,939 (Dec. 8, 2020). The Order specified that "the design, development, acquisition, and use of AI, as well as relevant inputs and outputs of particular AI applications, should be well documented and traceable." *Id.* Like the Clean Air Act's procedural requirements, this Order compels disclosure in the interest of avoiding hidden errors and biases in agency decision-making and providing the public a meaningful opportunity to comment on agency practice.

For all of these reasons, to the extent EPA used or plans to use AI tools in this rulemaking, it must document its use and any relevant inputs and outputs for the public.

E. To the Extent EPA is Engaging in Interagency Consultations, It Must Follow Statutory Docketing Requirements.

The Clean Air Act requires that all documents and written comments related to "any interagency review process"—including reviews conducted under Executive Order 12866 and related authorities—"shall be placed in the docket no later than the date of proposal of the rule" (for a proposed rule) and "no later than the date of promulgation" (for a final rule). 42 U.S.C. § 7607(4)(B)(ii). Troublingly, the record accompanying the Proposal suggests that EPA may be purposefully seeking to shield critical dialogue with other Executive Branch entities regarding the Proposal from public view.

The documentation of interagency review processes currently in the docket includes a draft of the Proposal with comment-bubble dialogue between an unidentified interagency commenter and EPA, dated April 29, 2026. *See* EPA-HQ-OAR-2025-3297-0054, Att. 11, at 1. The interagency commenter noted that the Proposal "will likely have the effect of increasing emissions nationally," and thereby "impose unanticipated burdens on States [agencies] who are responsible for implementing transportation conformity requirements under the Clean Air Act" and "put[] at risk State [agencies] transportation funding and long-planned projects." *Id.* The commenter further noted that the Proposal's DRIA fails to account for associated costs. *Id.* EPA responded that "EPA would like to engage with the commenter Agency or Department *outside the interagency review process for this rule on this topic*." *Id.* (emphasis added).

EPA's response indicates that the Agency may be intentionally channeling dialogue with sister agencies regarding the Proposal's significant impacts on States and their residents "outside the interagency review process," *id.*—presumably to avoid triggering EPA's statutory obligation to document written exchanges in the rulemaking docket. *See* 42 U.S.C. § 7607(4)(B)(ii). Regardless of whether such conduct violates the Clean Air Act's requirements, it highlights that EPA is not committed to full public transparency regarding this harmful Proposal, and it raises the specter of inappropriate political influence, potential docketing violations, or other bad-faith agency conduct in this rulemaking process. In the context of a Proposal to reverse urgently needed health protections, it is especially important for EPA to turn square corners with the public and uphold the spirit of the Clean Air Act's rulemaking process, in addition to adhering to

its specific procedural requirements. The public that will be harmed by this Proposal deserves complete transparency and robust public process.

To the extent EPA is engaging in interagency consultations regarding the Proposal or any action finalizing the Proposal, we underscore the Agency's obligation to follow all statutory docketing requirements.

CONCLUSION

For all of the above reasons, EPA must withdraw this illegal and unsupported Proposal.

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APPENDIX 1: EDF ANALYSIS: EMISSIONS AND HEALTH IMPACTS OF EPA'S PROPOSED ROLLBACK OF TIER 4 STANDARDS FOR MODEL YEAR 2027 AND 2028 VEHICLES AND A FULL REPEAL OF TIER 4 STANDARDS FOR NMOG+NOX AND PM

Environmental Defense Fund Analysis:

Emission and Health Impacts of EPA's Proposed Rollback of Tier 4 NMOG+NOx and PM Standards for Model Year 2027 and 2028 Light- and Medium-duty Vehicles and Impacts of a Full Repeal of Tier 4 Standards

July 6, 2026

The Environmental Protection Agency (EPA) is proposing to rollback Tier 4 emissions standards for Model Year 2027 and 2028 light- and medium-duty vehicles ("Proposal"). Environmental Defense Fund (EDF) developed independent estimates of the impact of EPA's proposed rollback of the Tier 4 Standards on nitrogen oxides (NOx), volatile organic compounds (VOC), and particulate matter (PM) emissions. EDF also calculated estimates of the health impacts resulting from the emissions increases, which EPA failed to include in the Proposal. Finally, EDF projected the emission and health impacts of a full repeal of the Tier 4 Standards.

I. Executive Summary

EPA's Proposal includes an estimate of the emission increases due to the rollback of MY 2027-28 Tier 4 standards but fails to include estimates of the health impacts of such a rollback. EDF found evidence that EPA's Motor Vehicle Emission Simulator (MOVES5) model underestimated the impact of the Tier 4 Standards on emissions, which led the Agency to also underestimate the impact of the Proposal. To fully understand the impact of the Proposal, EDF developed independent estimates of the benefits of the Tier 4 Standards using EPA's MOVES5.R3 model and then used those numbers to calculate more accurate estimates of the Proposal's impacts on NOx, VOC, and PM emissions. EDF also calculated the resulting health impacts of the Proposal using EPA's COBRA model. Additionally, EDF projected the emissions and health impacts of a full repeal (*i.e.,* beginning in MY 2027 and continuing indefinitely) of the Tier 4 Standards. Our results are summarized below. A full methodology and results follow.

In the Proposal, EPA assumes that all manufacturers will comply with the Tier 4 NMOG+NOx standards on the default compliance schedule. For light-duty vehicles (LDVs) and light light-duty trucks (LDTs) the default compliance schedules phase-in emissions requirements between 2027 and 2030. For heavy LDTs and medium-duty vehicles (MDVs) the default compliance schedule is not a phase-in of standards but a full emissions standard requirement by 2031. In our analysis we call this the "EPA default scenario." EDF recalculated the impact of this scenario based on updated inputs to the MOVES5.R3 model. We call this the "EDF default scenario." In the Proposal, EPA did not run a sensitivity analysis that reflects the possibility that manufacturers of heavy LDTs and MDVs will opt to comply on the "early option" compliance schedule EPA offered in the 2024 Rule, which allows them to phase in beginning in MY 2027 and to complete the phase-in by MY 2032 and 2031, respectively. Such a choice could result in emissions reductions earlier in the program. Therefore, EDF developed a third scenario called the "EDF Early Action Sensitivity" that estimates the impacts of the Proposal and a full repeal

assuming all heavy LDT and MDV manufacturers choose EPA's early compliance path. This scenario represents a likely upper bound of emissions increases as it is unlikely that all OEMs would choose the "early option." The "EDF default scenario" likely represents a lower bound, with actual emissions increases likely somewhere in between. EDF also projected the emissions impacts of a full repeal of the Tier 4 Standards. We assumed emissions from the MY 2027 and later model year vehicle fleet to be the same as those from MY 2026 vehicles.

Table ES-1 below shows the Proposal's cumulative increase in NOx and VOC emissions through 2055, comparing EPA's and EDF's calculations. It also shows the impact of a full repeal of the Tier 4 standards as estimated by EDF. As shown, EDF's estimated default scenario NOx emissions increases through 2055 are roughly one-third higher than EPA's estimates, and EDF's estimated VOC emissions increases are more than one-and-a-half times that of EPA's estimates. When accounting for the early option compliance sensitivity, which includes an impact on MDV emissions, EDF's estimates for both NOx and VOC emissions increases through 2055 are more than 2.5 times EPA's, highlighting EPA's underestimation of the impact of the Proposal on our nation's air.

Table ES-1: Cumulative Emission Impacts of the Proposal and a Full Repeal of the Tier 4 NMOG+NOx Standards, 2027-2055 (U.S. tons)

	NOx			VOC		
	EPA	EDF		EPA	EDF	
	Default	Default	Early Option	Default	Default	Early Option
Proposal – LDVs / LDTs	18,551	25,214	34,711	15,991	25,765	35,526
Proposal - MDVs			12,344			6,506
Proposal – Total	**18,551**	**25,214**	**47,055**	**15,991**	**25,765**	**42,032**
Full repeal – LDVs / LDTs		689,546			706,856	
Full repeal - MDVs		352,228			207,917	
Full Repeal - Total		**1,041,774**			**914,773**	

Table ES-1 also shows the estimated impact of a full repeal of the Tier 4 NMOG+NOx emissions standards. Based on EDF's analysis, if EPA fully eliminates the Tier 4 standards, light- and medium-duty vehicles could emit an additional 1 million tons of NOx pollution and more than 900,000 more tons of VOC pollution by 2055.

EDF projected the health impacts due to the increased NOx and VOC emissions associated with the Proposal using EPA's COBRA model. EDF ran COBRA for calendar years 2025-2050 at five-year intervals and a 2% annual discount rate using input files developed by EPA.[1] EDF estimated the PM and ozone health impacts from NOx and VOC.

Table ES-2 shows the cumulative health impacts of the Proposal and a full repeal of the Tier 4 NMOG+NOx Standards through 2055. Using EPA's own emission impact assumptions, EDF estimates that by 2055, the proposed weakening of NMOG+NOx standards could result in 102-129 more premature deaths and cost the nation an additional $2.1 to $2.5 billion in health harms. EDF's analysis of the default compliance scenario shows that the health costs of the Proposal could actually be as large as $3.5 billion by 2055, nearly $1 billion more than under the EPA default estimate. And premature deaths could reach 176 by 2055, nearly 50 deaths more than EPA's upper estimate for the same default scenario. Under the Early Option scenario modeled by EDF, which includes the emissions impact of MDVs, cumulative health costs could be as high as $6.4 billion by 2055—more than double the estimate under the EPA default scenario. And more than 270 people could die prematurely from PM- and ozone-related health harms—again, more than double the estimate under the EPA default scenario. EDF also estimated the health impacts of a full repeal of the NMOG+NOx standards. Under a full repeal, EDF estimates that between 5,200 and 6,600 people could die prematurely by 2055 and the health incidences could cost the nation as much as $141 billion.

[1] *Available at* https://www.epa.gov/cobra/cobra-future-input-files.

Table ES-2: Cumulative Health Impacts of the Proposal and a Full Repeal of the Tier 4 NMOG+NOx Standards, 2027-2055 (million $2024 or incidence)					
	Monetized Benefits ($ million)	Premature Mortality	ER and Hospital Visits	Asthma Symptoms	Lost School and Work Days
The Proposal					
EPA Default	$2,053 – $2,540	102 - 129	242	80,908	46,525
EDF Default	$2,812 – $3,474	140 - 176	333	111,607	64,202
EDF Early Option	$5,136 – $6,353	240 - 273	610	204,813	117,735
Full Repeal					
EDF Default	$114,953 - $141,198	5,284 – 6,610	12,321	4,042,929	2,340,371

EDF also evaluated the emissions impact of the Proposal and the impact of a full repeal of the Tier 4 PM standards. In general, this evaluation followed the same procedure described above for the NMOG+NOx standards. However, the Tier 4 PM standards apply to light- and medium-duty vehicles on a per vehicle basis, as opposed to the fleetwide nature of NMOG+NOx standards. BEVs can be used as part of the growing share of the fleet that must meet the Tier 4 PM standard during the phase-in (2027-2029) before all vehicles must meet the 0.5mg standard in 2030. MDVs have a slightly different schedule. But under the EPA default compliance schedule, the share of vehicles that must meet the Tier 4 standard only apply to LDVs and light LDTs. Under the early option compliance schedule, the percentages apply to LDVs and all LDTs. There is also an early option for MDVs with a different schedule. EDF developed estimates of the reduction in PM emissions under our own low and high BEV sales scenarios. The methodology is explained in more detail below.

As shown in Table ES-3, EPA estimates that the Proposal would result in a cumulative PM emissions increase of 3,295 tons by 2055. Depending on the level of BEV sales, EDF estimates that under the default scenario, PM emissions could actually increase by up to 3,700 tons by 2050. And under the early option compliance sensitivity, EDF estimates that PM could increase by more than nearly 6,000 tons under low BEV sales conditions—substantially more than EPA's estimate. If the Tier 4 PM standards were fully repealed, PM emissions could increase by as much as 138,00 tons to 161,000 tons cumulatively by 2055, depending on the BEV sales.

Table ES-3: Cumulative Emission Impacts of the Proposal and a Full Repeal of the Tier 4 PM Standards, 2027-2055 (U.S. tons per year)					
	EPA Default	EDF Default		EDF Early Option	
		Low BEV	High BEV	Low BEV	High BEV
Proposal - LDVs / LDTs	3,295	3,703	2,567	5,328	4,116
Proposal - MDVs				604	604
Proposal - Total	**3,295**	**3,703**	**2,567**	**5,932**	**4,720**
Full Repeal – LDVs / LDTs		140,606	118,353		
Full Repeal - MDVs		20,255	20,255		
Full Repeal - Total		**160,861**	**138,608**		

EDF used the same methodology described above for the Tier 4 NMOG+NOx standards to calculate the health impacts of both the Proposal and a full repeal of the Tier 4 PM standards. Our results in Table ES-4 show how EPA's underestimation of the emissions impacts of the Proposal result in a significant underestimation of the health impacts. Based on EPA's default compliance scenario, the Proposed rollback of the PM standard would result in 89-181 premature deaths by 2055, costing the nation up to $3.4 billion. Under EDF's default scenario, premature deaths could be as high as 203 and health costs as high as $3.8 billion, depending on the BEV sales assumed. And if manufacturers opt for the early compliance scenario, including for MDVs, the estimates for premature deaths rise to over 300 and the national PM and ozone-related costs jump to as high as $6 billion, depending on BEV sales, by 2055. If EPA were to fully repeal the Tier 4 PM standards, our nation could experience between 3,600 and 8,200 premature deaths in total between 2027 and 2055. The costs associated with those deaths and other health harms, like added ER and hospital visits, asthma symptoms and lost school and workdays, could range between $72 billion and $165 billion by 2055.

Table ES-4: Cumulative Health Impacts of the Proposal and Full Repeal of the Tier 4 PM Standards, 2027-2055 (million $2024 or incidence)					
	Monetized Benefits ($ million)	Premature Mortality	ER and Hospital Visits	Asthma Symptoms	Lost School and Work Days
Proposal					
EPA Default	$1,699 – $3,387	89 - 181	169	40,170	10,849
EDF Default – Low BEV	$1,909 – $3,806	101 - 203	190	45,130	12,189
EDF Default – High BEV	$1,324 – $2,640	70 - 142	132	31,386	8,478
EDF Early Option – Low BEV	$3,023 - $6,028	160 - 323	302	71,424	19,274
EDF Early Option – High BEV	$2,399 - $4,783	127 - 256	240	56,754	15,312
Full Repeal					
EDF Default – Low BEV	$84,199 - $164,518	4,129 – 8,183	7,586	1,735,807	475,848
EDF Default – High BEV	$72,405 - $141,555	3,558 – 7,055	6,541	1,498,267	410,403

Combined, the impact of the Proposal on NOx, VOC, and PM emissions and the related health harms is substantial. By 2055, total ozone- and PM-related health harms from the rollback of both the NMOG+NOx standards and the PM standards could cause 310 premature deaths by 2055 under EPA's default scenario and as many as 379 premature deaths under EDF's default scenario. These health harms could cost the nation a total of $6 billion cumulatively through 2055 assuming EPA's emissions increases or up to $7.2 billion, assuming the higher emissions increases under the EDF default scenario. EDF estimates that a full repeal of the Tier standards could result in 8,842 – 14,793 total premature deaths by 2055 with a cost of $187 - $305 billion cumulatively by 2055.

II. EDF's Analysis of the Emissions and Health Impacts of Changes to the Tier 4 NMOG+NOx Standards for Light-duty Vehicles and Light-duty Trucks

EDF found evidence that, in its MOVES5.R3 model, EPA underestimated the impact of the Tier 4 NMOG+NOx standards on emissions, which led the Agency to also underestimate the impact of the Proposal. The Proposal also failed to include estimates of the health impacts resulting from the proposed rollback. In EDF's analysis, using EPA's MOVES5.R3 model and the associated documentation, EDF recalculated the estimated benefits of the Tier 4 NMOG+NOx standards and then used those numbers to calculate the estimated emissions and health impacts of the Proposal, as well as a full repeal of the Tier 4 Standards.

Methodology

EDF used the output from EPA's MOVES5.R3 model in its analysis of the proposed rollback of the Tier 4 NMOG+NOx standards. In "*Exhaust Emission Rates for Light-Duty Onroad Vehicles in MOVES5*" (referred to in this document as "MOVES5 Technical Report") documentation of the modeling of the emissions impacts of the Tier 4 Standards, EPA stated that: "The resulting adjustments, summarized in Table 3-66, were applied to **all age-groups** and **all operating modes** representing start and running emission processes for gasoline and E85 vehicles within the LDV regulatory class for the model years indicated in Table 3-66."[2] Table 3-66 shows the ratios of the Tier 4 NMOG+NOx standards to the final Tier 3 Standards for model years 2027-2032 for light-duty vehicles (LDVs) and light-duty trucks (LDTs). For example, Table 3-66 states that the Tier 4 Standards require 17% and 11% reductions from the Tier 3 standards in 2027 for LDVs and LDTs, respectively, and 50% reductions for both vehicle classes in 2032. EDF notes that the Tier 4 impacts shown in Table 3-66 of the MOVES5 Technical Report assume that manufacturers will comply with the default Tier 4 Standards. Under EPA's default compliance schedule for the Tier 4 NMOG+NOx standards, standards for LDVs and light LDTs (LDTs with a GVWR less than 6,000 pounds, LDT1 and LDT2) are phased in starting with the 2027 model year. In contrast, the emission standards for heavy LDTs (LDT3 and LDT4) are not phased in, but apply to 100% of heavy LDT sales in 2030. Both MOVES5 and the Proposal assume that manufacturers will follow the default phase in schedule.[3]

However, EPA offered heavy LDT manufacturers the flexibility of complying with an early set of Tier 4 Standards identical to those applicable to LDVs and light LDTs. These latter standards gradually increase in stringency from 2027-2032, meaning that the final Tier 4 Standard (i.e., 15 mg/mi) does not need to be met until 2032, two years later than under the default schedule.

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[2] Exhaust Emission Rates for Light-Duty Onroad Vehicles in MOVES5, U.S. EPA, EPA-420-R-24-016, November 2024. (Emphasis added)

[3] In addition to the reductions shown in 3-66 in the MOVES5 Technical Report, EPA reduced the NMOG+NOx emissions from vehicle starts following intermediate soak periods due to Tier 4 provisions directly addressing those emissions. These reductions would increase the overall emission reductions of the Tier 4 Standards beyond those reflected by the change in the NMOG+NOx standards shown in Table 3-66.

However, under the early schedule, emission reductions begin in 2027, three years earlier than under the default standards. Regardless of the reasonableness of EPA's emission estimates under its default compliance schedule, EDF believes that it is appropriate to conduct analogous modeling under EPA's early compliance schedule, as manufacturers are allowed to use it to comply with the Tier 4 Standards, and it could result in earlier emissions reductions.

MOVES5.R3, however, does not project the activity or emissions of light and heavy LDTs separately, only those of all LDTs. Thus, the differences in the Tier 4 Standards applicable to light and heavy LDTs under EPA's default schedule requires any modeling of their emission impact to utilize a split in sales between light and heavy LDTs (the annual mileage and scrappage rates for these two LDT subclasses are the same, so sales-weighting is all that is required). EPA discusses LDT sales in its MOVES5 Technical Report. In the section addressing gaseous emissions, EPA describes using registration data from Polk to determine that 65% of LDT sales are light and 35% are heavy. This level is confirmed by our own analysis of more recent 2024 production data,[4] where heavy LDTs represent 37% of sales.

However, inexplicably, in the section of EPA's MOVES5 Technical Report addressing PM emissions, Table 4-13 shows effectiveness levels for the Tier 4 Standards for LDT emissions in model years 2027-2029 that are exactly half the levels for LDVs.[5] No explanation is provided for this difference. However, it seems highly likely that EPA simply assumed that half of LDT sales are heavy and therefore not subject to the Tier 4 Standards until 2030 under the default schedule. Given our own analysis of LDT sales, EPA's estimate presented in the gaseous emission section of the MOVES5 Technical Report appears supported by data, while their estimates in their PM analysis seem to be simply an assumption, and one that is inconsistent with its own estimate earlier in the report.

When evaluating the reasonableness of EPA's modeling of the Tier 4 Standards and the proposed rollback in the Proposal, we used EPA's estimate that 35% of LDT sales are heavy. When performing our own modeling of the impact of the Tier 4 Standards and the Proposal, we used our own estimate of 37%.

Elsewhere in the MOVES5 Technical Report, EPA acknowledges the fleetwide nature of the Tier 3 and 4 NMOG+NOx standards, wherein the certified emission levels of all: 1) LDVs and light LDTs and 2) heavy LDTs are sales-weighted and compared to their respective Tier 4 Standards. This sales-weighting includes diesel and electric vehicles. The vehicle fleet in MOVES5.R3 includes no diesel LDVs and relatively small volumes of diesel LDTs.

To evaluate how EPA actually reflected the impact of the Tier 4 Standards in the versions of the MOVES5.R3 model used to support the Proposal, EDF calculated VOC, NOx, and VOC+NOx emissions per mile from LDVs and LDTs for 2026-2032 model years across a wide range of

[4] EPA Trends Data https://www.epa.gov/automotive-trends/explore-automotive-trends-data
[5] The light/heavy LDT distinction ends after 2029.

vehicle ages.[6] Table 1 below presents the percentage reduction in VOC, NOx, and VOC+NOx emission factors for new vehicles relative to 2026 MY vehicles. These emission factors reflect the most direct application of EPA's stated methodology as there has been no time for any effects of vehicle malmaintenance, tampering, or similar activities to occur. Table 1 also shows the impact of the Tier 4 Standards relative to the Tier 3 Standards.

Table 1: Zero-Mile VOC and NOx Emission Impacts in MOVES5 and Tier 4 Standards				
	VOC	NOx	VOC+NOx	Tier 4 Standards per MOVES5 report
Model Year	Light-duty Vehicle (LDV)			
2027	-10%	-15%	-12%	-17%
2028	-15%	-23%	-18%	-23%
2029	-20%	-28%	-23%	-30%
2030	-24%	-33%	-27%	-37%
2031	-28%	-37%	-32%	-43%
2032	-32%	-41%	-36%	-50%
2055	-51%	56%	53%	-50%
	Light-duty Truck (LDT)			
2027	-7%	-10%	-8%	-11%
2028	-11%	-17%	-13%	-15%
2029	-14%	-21%	-17%	-19%
2030	-23%	-32%	-27%	-42%
2031	-26%	-35%	-29%	-46%
2032	-28%	-38%	-32%	-50%
2055	-42%	48%	45%	-50%

As can be seen in Table 1, the effects of the Tier 4 Standards on VOC+NOx emissions in EPA's modeling fall well short of those which EPA stated MOVES5 would reflect. For example, VOC+NOx emissions from 2031 model year cars only decrease 32% from 2026 levels, while the Tier 4 standards, per EPA's own calculations call for a 43% reduction. The effectiveness of the Tier 4 NMOG+NOx standards continues to increase in MOVES5.R3 through 2055 to the levels shown in Table 1. This is odd, because the Tier 4 Standards are fleetwide in nature and do not change between 2032 and 2055. As catalytic aftertreatment technology is constantly evolving

[6] VOC (volatile organic compounds) is approximately the same as NMOG (non-methane organic gases). For Tier 2 and later vehicles, which dominate the emissions for 2027 and beyond, exhaust NMOG emissions are 6.6% higher than VOC. Vehicle emission standards apply to NMOG emissions, while fleetwide emissions cited in regulatory analyses and used in atmospheric photochemical modeling use estimates of VOC emissions. EPA's estimates of the health impacts of organic emissions are expressed in terms of VOC emissions. Any conclusions drawn herein from VOC emissions apply to NMOG emissions, as well. For comparison against the Tier 3 and Tier 4 NMOG+NOx standards, EDF increased VOC emissions from MOVES5 by 6.6%.

and manufacturers are optimizing NMOG+NOx control, It is difficult to see manufactures maintaining ICEV emission levels as battery electric vehicle (BEV) sales increase beyond 2032. EPA makes no mention of any such assumptions in its modeling descriptions.

EDF extended this comparison to vehicles ranging from one year old to 28 years old and found VOC+NOx impacts in EPA's running of MOVES5.R3 a few percentage points higher than those shown on the left hand side of Table 1. However, these Tier 4 impacts in MOVES5.R3 are still well short of those in the final column of Table 1.[7] This increase in effectiveness with vehicle age supports EDF's belief that the effect of the Tier 4 Standards affects essentially all onroad operating conditions. Had EPA followed its own stated methodology in its MOVES5 technical documentation, the Tier 4 emission impacts produced by its running of MOVES5.R3 would have been higher and the impact of the rollback would have been higher, as well. In addition, in EPA's modeling of the Proposal, the results decreased NMOG+NOx emissions from 2027 and 2028 model year vehicles by several percent from 2026 levels. EDF knows of no reason for this reduction, as these vehicles would revert to the Tier 3 standards under the proposal.

As a result, EDF developed its own projections of the emissions and health impacts of the proposed delay of the Tier 4 NMOG+NOx standards. EDF used the MOVES5.R3 output from EPA's No Action case (i.e., with the current Tier 4 Standards in place) as the initial basis of its projections as follows.[8]

In both cases, EDF first removed the impacts (reflected in the first two columns of Table 1) of the default Tier 4 Standards, effectively setting the VOC+NOx emissions from 2027 and later MY vehicles to the MOVES5.R3 emission levels for 2026 model year vehicles. This is the latest model year of vehicles meeting the final Tier 3 Standards. Under the "default" compliance scenario, EDF then reduced emissions from LDVs and light LDTs by the percentages shown in the last column of Table 1, consistent with EPA's stated methodology for modeling the impact of the Tier 4 Standards. VOC and NOx emissions are modeled separately in MOVES5.R3 and have distinct health impacts. When applying the percentage reductions for VOC+NOx emissions to the Tier 3 VOC and NOx emissions, EDF followed EPA's general approach to assume equivalent mass reductions in both pollutants.

EDF modeled the emission impacts of three scenarios: (1) correcting the emissions increase estimates for the default scenario where only vehicles under 6,000 lbs experience a change in emissions in MY2027 and 2028 ("EDF Default Scenario"), (2) a sensitivity where 100% of original equipment manufacturers (OEMs) use the early option and the Proposal causes emissions increases for all light-duty vehicles ("EDF Early Option Sensitivity"), and (3) a full

[7] It is unusual to see the effect of a change in an emission standard increase in effectiveness with vehicle age. Normally, some aspect of driving patterns, meteorology, malmaintenance or tampering causes emissions to increase and the additional control technology does not have a proportional effect on the effect of these conditions.
[8] Vehicle sales and VMT are the same for EPA's No Action and Action cases, and the emissions for model year 2026 and earlier model year vehicles are also identical. Thus, EDF's decision to start with the No Action case projections had no effect on this analysis.

repeal of the Tier 4 Standards ("Repeal of Tier 4").[9] In addition to modeling the emission increases, EDF also estimates the health impacts of these three scenarios as well as EPA's Central Case emissions estimates ("EPA Default Scenario").

Under the EDF Early Option Sensitivity, EDF reduced emissions of LDVs, both light and heavy LDTs by the percentages shown in the last column of Table 1. While it is unlikely that all OEMs will take the Early Option for Tier 4, it is reasonable to assume some will. Given the inability to estimate what share, EDF presents this scenario as an upper bound of the impacts of the Proposal. It is likely that the actual emissions increase that will result from the Proposal is somewhere between the EDF Default Scenario and the EDF Early Option Sensitivity.

Results

The resulting emission impacts of the Proposal are shown in Table 2. Under the EDF Default Scenario, estimates of the NOx emissions increases in the early years are roughly 1.5 times EPA's estimates, and EDF's estimates of VOC emissions increases are roughly double EPA's estimates. Under the EDF Early Option Sensitivity, the estimates are even higher. Cumulatively, between 2027 and 2055, EPA underestimated the increase in both NOx and VOC emissions by 6,600 tons and nearly 10,000 tons, respectively, under EDF's default scenario and up to 16,000 tons and more than 19,500 tons, respectively, in the early option scenario.

Table 2: Emission Impacts of Proposed Rollback of Tier 4 NMOG+NOx Standards (U.S. tons per year)

Calendar Year	NOx			VOC		
	EPA	EDF		EPA	EDF	
	Default	Default	Early Option	Default	Default	Early Option
2027	389	657	878	354	711	962
2028	976	1,517	2,033	863	1,643	2,228
2029	932	1,453	1,948	824	1,575	2,136
2030	887	1,391	1,865	784	1,509	2,048
2031	930	1,413	1,905	817	1,507	2,050
2032	1,018	1,457	1,977	880	1,519	2,074
2033	1,024	1,438	1,959	887	1,488	2,035
2034	1,058	1,435	1,964	914	1,468	2,014
2035	1,031	1,387	1,899	883	1,405	1,927
2036	1,019	1,348	1,848	861	1,348	1,848
2037	1,008	1,318	1,808	856	1,307	1,789
2038	1,022	1,302	1,788	868	1,276	1,744
2039	950	1,210	1,661	807	1,185	1,619

[9] Medium-duty vehicles (Class 2b/3) were modeled separately and are discussed below.

2040	876	1,114	1,530	743	1,092	1,492
2041	796	1,008	1,391	674	988	1,356
2042	710	896	1,244	603	879	1,215
2043	626	787	1,099	533	774	1,077
2044	551	687	968	467	676	947
2045	482	598	849	407	587	830
2046	421	518	742	354	509	726
2047	355	439	632	303	437	628
2048	291	366	530	257	374	541
2049	253	316	461	223	323	470
2050	219	272	400	192	278	409
2051	189	234	347	166	239	354
2052	164	202	301	144	206	308
2053	143	174	261	125	178	267
2054	123	150	226	108	153	231
2055	106	129	196	93	132	200
Cumulative	**18,551**	**25,214**	**34,711**	**15,991**	**25,765**	**35,526**

EDF also projected the emissions impacts of a full repeal of the Tier 4 Standards. Emissions from the 2027 and later model year vehicle fleet were assumed to be the same as those from 2026 model year vehicles at the same vehicle age under the Repeal of Tier 4 Standards scenario.

Table 3 shows the estimated increases in VOC and NOx emissions from a full repeal of the Tier 4 NMOG+NOx standards where all OEMs choose the default standards. By 2055, NOx emissions could increase by up to 690,000 tons and VOC emissions could increase by more than 700,000 tons.

Table 3: Emission Impacts of a Repeal of the Tier 4 NMOG+NOx Standards (U.S. tons per year)

Calendar Year	NOx	VOC
2027	657	711
2028	1,517	1,643
2029	2,575	2,791
2030	4,458	4,863
2031	6,556	7,142
2032	8,809	9,582
2033	11,022	11,954
2034	13,272	14,309
2035	15,456	16,564
2036	17,637	18,774

2037	19,771	20,910
2038	21,854	22,958
2039	23,831	24,890
2040	25,751	26,734
2041	27,521	28,422
2042	29,145	29,965
2043	30,599	31,339
2044	31,893	32,559
2045	33,028	33,623
2046	34,008	34,535
2047	34,840	35,306
2048	35,545	35,952
2049	36,124	36,474
2050	36,590	36,895
2051	36,959	37,219
2052	37,245	37,462
2053	37,469	37,644
2054	37,640	37,773
2055	37,772	37,865
Cumulative	**689,546**	**706,856**

EDF projected health impacts due to the increased VOC, NOx, and PM emissions associated with the Proposal using EPA's COBRA model.[10] EDF ran COBRA for calendar years 2025-2050 at five-year intervals and a 2% annual discount rate using input files developed by EPA.[11] Each of our runs of COBRA reduced either VOC, NOx, or PM emissions by 10% to calculate the impacts for PM and ozone pollution. Health impacts per ton of emission reduction were then calculated by dividing the projected nationwide health impacts by the change in emissions. COBRA includes a range of impacts for changes in emissions which affect ambient PM levels (here NOx and PM emissions). EDF utilized both sets of PM damage functions and presents the results as a range. COBRA only calculates one set of ozone damages. COBRA estimates monetized health impacts in terms of $2023. These were converted to $2024 using the implicit price deflators developed by EPA for use in its OMEGA models.

The health impacts of the Proposal in the EPA Default Scenario are shown in Table 4 using the emissions increases shown in Table 2. Net present value of the monetized health impacts in 2055 was determined using a 2% discount rate in this analysis. Using EPA's own emission impacts, EDF estimates that by 2055, the proposed rollback in the Tier 4 NMOG+NOx standards could

[10] CO-Benefits Risk Assessment Health Impacts Screening and Mapping Tool (COBRA) | US EPA
[11] COBRA Future Input Files | US EPA

result in up to 129 more premature deaths and cost the nation an additional $2.5 billion in health costs.

Table 4: Health Impacts of the Proposed Rollback of Tier 4 NMOG+NOx Standards (million $2024 or incidence) – EPA Default Scenario					
Calendar Year	Monetized Harms ($ million)	Premature Mortality	ER and Hospital Visits	Asthma Symptoms	Lost School and Work Days
2027	$40 - 50	2 - 3	6	1,957	1,109
2028	$101 - 127	6 - 7	14	4,952	2,806
2029	$101 - 126	6 - 7	14	4,782	2,710
2030	$100 - 124	5 - 7	13	4,599	2,608
2031	$108 - 134	6 - 7	14	4,842	2,756
2032	$122 - 151	6 - 8	16	5,320	3,039
2033	$126 - 157	7 - 8	16	5,378	3,084
2034	$134 - 167	7 - 9	17	5,580	3,212
2035	$135 - 167	7 - 9	16	5,460	3,155
2036	$137 - 169	7 - 9	16	5,414	3,129
2037	$139 - 172	7 - 9	16	5,380	3,110
2038	$145 - 179	7 - 9	17	5,479	3,168
2039	$138 - 170	7 - 8	16	5,114	2,958
2040	$130 - 160	6 - 8	14	4,733	2,738
2041	$121 - 149	6 - 7	13	4,321	2,500
2042	$110 - 135	5 - 6	12	3,878	2,244
2043	$99 - 121	5 - 6	11	3,433	1,987
2044	$88 - 109	4 - 5	9	3,035	1,756
2045	$79 - 97	4 - 4	8	2,670	1,545
2046	$70 - 86	3 - 4	7	2,340	1,355
2047	$60 - 74	3 - 3	6	1,987	1,151
2048	$50 - 61	2 - 3	5	1,640	950
2049	$44 - 54	2 - 2	4	1,430	829
2050	$39 - 47	2 - 2	4	1,243	721
2051	$33 - 41	1 - 2	3	1,075	624
2052	$29 - 35	1 - 2	3	932	541
2053	$25 - 31	1 - 1	3	810	470
2054	$22 - 27	1 - 1	2	700	406
2055	$19 - 23	1 - 1	2	604	350
Cumulative or NPV	**$2,053 – 2,540**	**102 - 129**	**242**	**80,908**	**46,525**

Table 5 shows the health impacts of the Proposal under the EDF Default Scenario. EDF's analysis of the default compliance scenario shows that the health costs of the proposed rollback could be up to $3.5 billion by 2055, nearly $1 billion more than under the EPA Default Scenario. And premature deaths could reach 176 by 2055, nearly 50 more deaths than the EPA Default Scenario.

Table 5: Health Impacts of Proposed Rollback of Tier 4 NMOG+NOx Standards (million $2024 or incidence) – EDF Default Scenario

Calendar Year	Monetized Harms ($ million)	Premature Mortality	ER and Hospital Visits	Asthma Symptoms	Lost School and Work Days
2027	$68 - 85	4 - 5	10	3,348	1,899
2028	$160 - 199	9 - 11	23	7,821	4,437
2029	$159 - 198	9 - 11	22	7,575	4,299
2030	$158 - 197	9 - 11	21	7,330	4,161
2031	$166 - 206	9 - 11	22	7,468	4,256
2032	$176 - 219	9 - 12	23	7,721	4,416
2033	$179 - 222	9 - 12	23	7,653	4,394
2034	$184 - 228	10 - 12	23	7,665	4,417
2035	$183 - 227	9 - 12	22	7,434	4,300
2036	$183 - 226	9 - 12	22	7,249	4,194
2037	$183 - 226	9 - 11	21	7,113	4,116
2038	$186 - 229	9 - 11	21	7,050	4,081
2039	$177 - 218	9 - 11	20	6,579	3,809
2040	$167 - 205	8 - 10	19	6,084	3,523
2041	$154 - 190	7 - 9	17	5,534	3,205
2042	$140 - 172	7 - 8	15	4,943	2,862
2043	$125 - 154	6 - 7	13	4,362	2,526
2044	$111 - 137	5 - 6	12	3,828	2,217
2045	$99 - 121	4 - 6	10	3,346	1,938
2046	$87 - 107	4 - 5	9	2,916	1,689
2047	$75 - 92	3 - 4	8	2,482	1,439
2048	$63 - 78	3 - 3	6	2,082	1,207
2049	$55 - 68	2 - 3	6	1,805	1,047
2050	$49 - 59	2 - 3	5	1,563	907
2051	$42 - 51	2 - 2	4	1,346	781
2052	$36 - 44	2 - 2	4	1,159	673
2053	$31 - 38	1 - 2	3	1,001	581
2054	$27 - 33	1 - 1	3	861	499
2055	$23 - 28	1 - 1	2	740	430

Cumulative or NPV	**$2,812 – 3,474**	**140 - 176**	**333**	**111,607**	**64,202**

The health impacts of the Proposal for the EDF Early Option Sensitivity are shown in Table 6. Under this scenario, cumulative health costs could be as high as $4.8 billion by 2055— nearly double the estimates under EPA's Default Scenario. And more than 190 people could die prematurely from PM-related health harms—50% more than under the EPA Default estimate. As discussed above, this represents a likely upper bound of the impacts of the Proposal as it is unlikely that all OEMs will choose the Early Option.

Table 6: Health Impacts of Proposed Rollback of Tier 4 NMOG+NOx Standards (million $2024 or incidence) – EDF Early Option Sensitivity

Calendar Year	Monetized Benefits ($ million)	Premature Mortality	ER and Hospital Visits	Asthma Symptoms	Lost School and Work Days
2027	$91 - 114	5 - 5	13	4,484	2,544
2028	$214 - 267	11 - 12	30	10,492	5,953
2029	$214 - 266	11 - 12	29	10,166	5,770
2030	$212 - 264	11 - 12	28	9,839	5,586
2031	$224 - 278	11 - 12	29	10,078	5,743
2032	$239 - 297	12 - 13	31	10,485	5,998
2033	$245 - 303	12 - 13	31	10,428	5,988
2034	$252 - 312	12 - 13	31	10,490	6,046
2035	$251 - 310	12 - 13	30	10,183	5,890
2036	$251 - 310	12 - 13	30	9,940	5,750
2037	$252 - 311	11 - 13	29	9,759	5,647
2038	$255 - 314	11 - 13	29	9,679	5,602
2039	$243 - 299	11 - 12	27	9,028	5,226
2040	$229 - 282	10 - 11	25	8,355	4,838
2041	$213 - 261	9 - 10	23	7,630	4,418
2042	$194 - 238	8 - 9	21	6,858	3,972
2043	$175 - 215	7 - 8	19	6,094	3,529
2044	$157 - 193	6 - 7	17	5,390	3,121
2045	$140 - 172	6 - 6	15	4,750	2,751
2046	$124 - 153	5 - 6	13	4,173	2,418
2047	$108 - 132	4 - 5	11	3,575	2,072
2048	$92 - 112	3 - 4	9	3,015	1,748
2049	$81 - 99	3 - 3	8	2,635	1,529

2050	$71 - 87	3 - 3	7	2,299	1,334
2051	$62 - 76	2 - 3	6	1,993	1,157
2052	$54 - 66	2 - 2	5	1,729	1,004
2053	$47 - 57	2 - 2	5	1,501	871
2054	$40 - 49	1 - 2	4	1,299	754
2055	$35 - 43	1 - 1	3	1,123	652
Cumulative or NPV	**$3,872 – $4,784**	**176 - 192**	**458**	**153,422**	**88,270**

EDF also calculated the health impacts of a full repeal of the Tier 4 Standards. Table 7 shows the health impacts if the Tier 4 NMOG+NOx standards are repealed, under the default standards scenario. EDF's analysis finds that by 2055, a repeal of the standards could result in an additional nearly 4,500 premature deaths, 8,400 more ER and hospital visits, 2.8 million more asthma incidences, and 1.6 million more lost school and workdays. These health harms could cost our nation an additional $95 billion cumulatively through 2055.

Table 7: Health Impacts of a Repeal of the Tier 4 NMOG+NOx Standards (million $2024 or incidence)

Calendar Year	Monetized Benefits ($ million)	Premature Mortality	ER and Hospital Visits	Asthma Symptoms	Lost School and Work Days
2027	$68 - 85	4 - 5	10	3,348	1,899
2028	$160 - 199	9 - 11	23	7,821	4,437
2029	$282 - 351	16 - 20	39	13,423	7,619
2030	$508 - 631	28 - 35	68	23,502	13,343
2031	$771 - 958	41 - 52	101	34,717	19,788
2032	$1070 - 1327	57 - 72	137	46,860	26,812
2033	$1380 - 1709	72 - 91	174	58,888	33,823
2034	$1711 - 2117	88 - 111	211	71,198	41,046
2035	$2051 - 2534	105 - 132	248	83,251	48,173
2036	$2403 - 2966	121 - 152	286	95,347	55,185
2037	$2764 - 3408	137 - 173	323	107,280	62,107
2038	$3132 - 3859	154 - 193	360	119,020	68,919
2039	$3500 - 4309	170 - 213	395	130,270	75,452
2040	$3873 - 4765	186 - 233	430	141,285	81,852
2041	$4222 - 5191	200 - 250	463	151,681	87,872
2042	$4559 - 5602	213 - 267	493	161,372	93,483
2043	$4879 - 5991	225 - 282	521	170,209	98,601
2044	$5182 - 6360	237 - 296	546	178,235	103,249

2045	$5467 - 6705	247 - 308	569	185,439	107,420
2046	$5714 - 7004	255 - 318	590	191,768	111,128
2047	$5941 - 7278	262 - 327	607	197,308	114,381
2048	$6151 - 7529	268 - 334	623	202,170	117,242
2049	$6342 - 7758	273 - 340	637	206,355	119,712
2050	$6515 - 7966	278 - 345	649	209,922	121,826
2051	$6581 - 8046	280 - 349	655	212,015	123,039
2052	$6631 - 8108	282 - 351	660	213,637	123,980
2053	$6670 - 8156	284 - 354	664	214,902	124,713
2054	$6700 - 8193	285 - 355	667	215,863	125,270
2055	$6723 - 8221	286 - 356	669	216,604	125,699
Cumulative or NPV	**$77,461 – $95,065**	**3,600 – 4,499**	**8,408**	**2,753,707**	**1,594,593**

III. EDF's Analysis of the Emissions and Health Impacts of Changes to the Tier 4 PM Standards for Light-duty Vehicles and Light-duty Trucks

The nature of the Tier 4 PM standards differ from that of the Tier 4 NMOG+NOx standards, and EDF has multiple distinct concerns with EPA's modeling of the PM standards. The Tier 4 PM standards apply on a per vehicle basis, versus the corporate fleetwide average nature of the NMOG+NOx standards. While BEVs have no exhaust PM emissions, they are included in the number of vehicles complying with the Tier 4 PM standards and once 100% of the fleet must meet the Tier 4 PM standard, BEVs emit less PM than ICEVs meeting the Tier 4 standard.

Methodology

In general, EDF's evaluation of EPA's modeling of the impact of the Tier 4 PM standards and the Proposal followed the same procedure as that described above for its evaluation of the NMOG+NOx standards. EDF used EPA's published output from its runs of MOVES5.R3 to determine how EPA modeled the effects of the proposed rollback of the Tier 4 PM standards. As in the case of NMOG+NOx, EDF discovered apparent inconsistencies between EPA's modeling of the Tier 4 PM standards and the regulatory design of the standards.

The Tier 4 PM standards apply to LDVs and LDTs on a per vehicle basis, unlike the fleetwide NMOG+NOx standards that apply to the sales-weighted average emission levels of a broad averaging group including all LDV and LDTs sales. The Tier 4 PM standards also phase in between 2027 and 2030, versus 2027 and 2032 for the NMOG+NOx standards. For the 2027-2030 model years, 20%, 40%, 60%, and 100% of LDV and light LDT sales must meet the Tier 4 PM standard of 0.5 mg/mile. Under the default compliance scenario, heavy LDTs do not need to meet this standard until 2030, when 100% of sales must meet the standard. The Proposal does not change the default standards.

As mentioned above, BEVs are included in the calculations used to determine compliance with the Tier 4 Standards. Due to the sales-weighted nature of the Tier 4 NMOG+NOx standards, BEV sales do not affect fleetwide emission requirements. Higher BEVs sales allow higher NMOG+NOx emissions from internal combustion engine vehicles (ICEVs), while lower BEV sales require lower ICEV emissions to meet the same NMOG+NOx standard. In either case, fleetwide NMOG+NOx emissions are the same.

For PM, the per-vehicle nature of the standard allows BEVs to be counted towards the 20-60% compliance percentages applicable to the Tier 4 PM standard in model years 2027-2029 when the standard does not apply to all LDV and LDT vehicle sales. Under the EPA default compliance schedule, these sales percentages only apply to LDVs and light LDTs. Under the early option compliance schedule, the percentages apply to LDVs and all LDTs, light and heavy.

Due to the zero PM emission levels of BEVs, manufacturers will likely count their BEV sales toward the 20% and 40% sales requirements in 2027 and 2028, respectively. However, there is no credit trading program for PM emissions in the Tier 4 program. Thus, BEVs sold by all-electric manufacturers like Tesla and Rivian easily comply with the Tier 4 PM standards, but no PM credits are generated which could be sold to manufacturers that produce ICEVs.

Based on Tesla's historic level of BEV sales, EDF estimates that half of all LD BEV sales are sold by all electric manufacturers. Given the challenge of separating BEVs sales between light and heavy LDTs, EDF used the conservative assumption that zero heavy LDTs are BEVs.

BEV sales under the central case in MOVES5.R3 are 18% (in MY 2027) and 20% (in MY 2028) for LDVs and 9% and 10% for LDTs, respectively. Thus, EDF estimates that half of those BEV sales, 9% and 10% for LDVs and 4% and 5% for LDTs, respectively, can be used to ease compliance with the phase-in of the Tier 4 Standards.

Using LDVs in 2028 as an example, of the 40% of the LDVs required to meet the Tier 4 PM standard, 20% of those vehicles are BEVs. This means that the remaining 20% of the fleet that must meet the Tier 4 standard must come from ICEVs. MOVES5.R3 assumes that ICEVs meeting the Tier 4 PM standard are equipped with GPFs, which are roughly 95% efficient at reducing PM emissions.[12] ICE LDVs represent 80% of total LDV sales (100% less the 20% BEV sales in EPA's central case), so the 20% of LDV sales with GPFs represent 25% of total ICE LDV sales. Thus, the Tier 4 PM standard for LDVs in 2028 should reduce PM emissions by 95% on 25% of LDV sales.

Table 8 shows the same calculations for both MY 2027 and 2028 LDVs and LDTs. Again, EDF assumed that all BEV sales occurred in the LDV and light LDT regulatory classes and that BEV

[12] The MOVES5 documentation for exhaust emission modeling referenced above does not provide an overall efficiency for the use of GPFs. Table 4-22 shows GPF effectiveness levels of 98.5-99.9% for the elemental carbon portion of PM emissions and 75-80% for non-elemental carbon PM emissions. The overall effect of GPFs on PM emissions appears to be very close to 95%.

sales of heavy LDTs were negligible. We assume here that heavy LDT sales are 35% of LDT sales per EPA's MOVES5 documentation for exhaust emission modeling. At the bottom of each of the 2027 model year and 2028 model year sections, we also show the PM reduction from ICEVs occurring in MOVES5.R3.

Table 8: Effect of the Tier 4 PM Standards on LDV and LDT PM Emissions in Model Years 2027 and 2028 in the EPA Central Case				
	LDV	Light LDT	Heavy LDT	All LDT
	2027			
Tier 4 Requirement	20%	20%	0%	12.6%
MOVES5.R3 BEV Sales - Central	17.9%	13.5%	0%	8.7%
BEV Sales Used by ICEV Manufacturers	9.0%	6.7%	0%	4.3%
ICEV Sales meeting Tier 4 PM Standard (% of all sales)	11.0%	13.3%	0.0%	8.3%
ICEV Sales meeting Tier 4 PM Standard (% of ICEV sales)	12.1%	14.2%	0.0%	8.6%
PM Emission Reduction	11.5%	13.5%	0.0%	8.2%
MOVES5.R3 PM Reduction	19.1%	---	---	9.5%
	2028			
Tier 4 Requirement	40%	40%	0%	25.2%
MOVES5.R3 BEV Sales - Central	19.9%	16.0%	0%	10.4%
BEV Sales Used by ICEV Manufacturers	9.0%	8.0%	0%	5.2%
ICEV Sales meeting Tier 4 PM Standard (% of all sales)	31.0%	32.0%	0%	20.0%
ICEV Sales meeting Tier 4 PM Standard (% of ICEV sales)	33.4%	34.8%	0.0%	21.1%
PM Emission Reduction	31.7%	33.1%	0.0%	20.1%
MOVES5.R3 PM Reduction	38.1%	---	---	18.9%

As demonstrated, BEV sales have a large impact on the number of ICEVs that require GPFs in 2027 and 2028 when the percentages of vehicles required to meet the Tier 4 standards are

relatively low.[13] Also, the implied reduction in PM emissions required by the Tier 4 Standards, assuming 95% efficient GPFs, is lower than the reductions reflected in MOVES5.R3.

Using this same methodology, EDF developed estimates of the reduction in PM emissions under our own low and high BEV sales scenarios, plus our estimate that 37% of LDTs are heavy LDTs. In the Proposal, EPA presents two different high and low BEV levels for MY2027 and MY2028. One from OMEGA and one from MOVES5.R3. It is unexplained in the Proposal why these two sets of BEV levels are different. In order to cover the full range of impacts from EPA's low and high BEV levels, EDF used the higher of the highs and the lower of the lows for each year. The low BEV levels EDF used are 4% in MY2027 and 8% in MY2028. The high BEV levels are 15.8% in MY2027 and 17.5% in MY2028. For the high and low BEV cases for the modeling of the repeal of Tier 4, EDF used the OMEGA central case BEV levels as the high BEV levels and for the low BEV case, EDF assumed BEV levels would stay roughly where they are currently at 10% for every year.

Table 9 shows EDF's estimates of the effect of the Tier 4 PM standards in 2027 and 2028, as well as EDF's revised estimates.

Table 9: Effect of the Tier 4 PM Emission Standards on ICE PM Emissions Relative to Model Year 2026 Emissions Under EDF Low and High BEV Scenarios

	Low BEV		High BEV	
Model Year	LDV	LDT	LDV	LDT
	Default Compliance Scenario			
2027	17.0%	10.6%	10.4%	6.3%
2028	34.9%	21.6%	30.8%	18.6%
	Early Option Sensitivity			
2027	17.0%	17.8%	10.4%	13.8%
2028	34.9%	36.1%	30.8%	33.7%

Results

Table 10 shows the emissions impacts of the proposed rollback of Tier 4 PM standards. EPA, for their Central Case, concluded that by 2055, the Proposal could increase PM emissions by 3,295 tons. EDF projected that PM emissions could increase by between 2,567 tons and 5,328 tons by 2055 depending on the amount of BEV sales and the compliance scenario.

[13] As discussed in more detail in Appendix 2 and in the main comments, EPA justified the feasibility of the Tier 4 PM standards in 2024 with very low levels of BEVs. As such, the benefit of BEVs for OEM's compliance does not diminish the eminent feasibility of the PM standard with ICEVs alone.

Table 10: Emission Impacts of Proposed Rollback of Tier 4 PM Standards (U.S. tons per year)					
Calendar Year	EPA Default Scenario	EDF Default Scenario		EDF Early Option Scenario	
		Low BEV	High BEV	Low BEV	High BEV
2027	51	57	30	80	52
2028	145	162	113	228	176
2029	139	155	108	219	169
2030	133	149	104	210	162
2031	145	162	110	231	175
2032	169	191	133	275	213
2033	167	188	130	271	209
2034	170	191	133	274	212
2035	167	187	129	268	207
2036	168	188	131	269	208
2037	167	187	129	267	204
2038	174	195	136	276	213
2039	162	181	126	257	198
2040	150	167	117	237	183
2041	135	152	106	215	167
2042	131	147	101	209	160
2043	136	152	106	216	168
2044	118	132	93	190	148
2045	102	115	81	167	130
2046	88	99	70	145	114
2047	81	92	64	136	105
2048	81	91	64	135	106
2049	69	78	55	117	92
2050	59	67	47	101	80
2051	50	57	41	88	69
2052	43	49	35	76	60
2053	37	42	30	65	52
2054	31	36	26	56	45
2055	27	31	22	49	39
Cumulative	**3,295**	**3,703**	**2,567**	**5,328**	**4,116**

Table 11 shows the emission impacts of a hypothetical full repeal of the Tier 4 PM standards under EDF's low and high BEV sales scenarios. EDF's analysis shows that by 2055, the cumulative PM emissions increase could be between 118,000 and 141,000 tons, depending on the level of BEV sales.

Table 11: Emission Impacts of a Repeal of the Tier 4 PM Standards (U.S. tons per year)		
Calendar Year	Low BEV	High BEV
2027	43	47
2028	128	169
2029	278	294
2030	650	632
2031	1,010	962
2032	1,376	1,288
2033	1,751	1,620
2034	2,204	2,024
2035	2,640	2,402
2036	3,086	2,782
2037	3,523	3,154
2038	3,975	3,532
2039	4,410	3,884
2040	4,858	4,246
2041	5,272	4,572
2042	5,661	4,881
2043	6,028	5,165
2044	6,369	5,417
2045	6,719	5,678
2046	7,028	5,900
2047	7,306	6,098
2048	7,563	6,273
2049	7,797	6,425
2050	8,035	6,579
2051	8,245	6,701
2052	8,431	6,800
2053	8,596	6,884
2054	8,744	6,949
2055	8,877	6,996
Cumulative	**140,606**	**118,353**

EDF used the same methodology described above for the Tier 4 NMOG+NOx standards to calculate the health impacts of the proposed rollback and a full repeal of the Tier 4 PM standards. The tables below show EDF's health impact estimates based on EPA's emission estimates for the Proposal and EDF's projections for health impacts for both the Proposal and a full repeal across the different compliance scenarios. Net present value of the monetized health impacts was again determined using a 2% discount rate. Our results show how EPA's underestimation of the emissions impacts of the Proposal results in a significant underestimation of the health impact of the Proposal across our nation.

Table 12 shows the health impacts of the Proposal using EPA's Default Scenario PM emissions increases. Using EPA's emissions estimates, EDF calculates up to 180 premature deaths and up to $3.4 billion in health-related costs to our nation.

Table 12: Health Impacts of Proposed Rollback of Tier 4 PM Standards (million $2024 or incidence) – EPA Default Scenario

Calendar Year	Monetized Benefits ($ million)	Premature Mortality	ER and Hospital Visits	Asthma Symptoms	Lost School and Work Days
2027	$23 - 48	1 - 3	3	713	195
2028	$67 - 139	4 - 8	8	2,056	559
2029	$67 - 139	4 - 8	8	1,994	539
2030	$67 - 138	4 - 8	8	1,934	519
2031	$75 - 155	4 - 9	9	2,112	565
2032	$92 - 187	5 - 11	10	2,496	667
2033	$94 - 191	5 - 11	10	2,486	662
2034	$98 - 199	5 - 11	10	2,541	676
2035	$100 - 201	5 - 11	10	2,511	666
2036	$104 - 208	6 - 11	11	2,538	675
2037	$106 - 212	6 - 11	11	2,537	678
2038	$114 - 228	6 - 12	11	2,657	712
2039	$110 - 217	6 - 11	11	2,479	666
2040	$104 - 205	5 - 11	10	2,295	619
2041	$96 - 190	5 - 10	9	2,086	565
2042	$96 - 188	5 - 10	9	2,027	551
2043	$101 - 198	5 - 10	9	2,102	573
2044	$90 - 176	4 - 9	8	1,834	502
2045	$80 - 155	4 - 8	7	1,591	437
2046	$70 - 136	3 - 7	6	1,375	379
2047	$66 - 128	3 - 6	6	1,276	353
2048	$67 - 129	3 - 6	6	1,271	353
2049	$58 - 112	3 - 5	5	1,090	303

2050	$51 - 98	2 - 5	4	935	261
2051	$43 - 84	2 - 4	4	799	223
2052	$37 - 71	2 - 3	3	683	191
2053	$32 - 61	1 - 3	3	584	163
2054	$27 - 52	1 - 2	2	500	139
2055	$23 - 45	1 - 2	2	428	119
Cumulative or NPV	**$1,699 – $3,387**	**89 - 181**	**169**	**40,170**	**10,849**

Based on EDF's analysis, the health impacts of the Proposal under EDF's low BEV and Default Scenario are shown in Table 13. Under this scenario, the Proposal would cost Americans an additional $1.9-3.8 billion in health care costs and cause up to 200 additional premature deaths.

Table 13: Health Impacts of Proposed Rollback of Tier 4 PM Standards (million $2024 or incidence) – EDF Low BEV and Default Scenario

Calendar Year	Monetized Benefits ($ million)	Premature Mortality	ER and Hospital Visits	Asthma Symptoms	Lost School and Work Days
2027	$26 - 54	2 - 3	3	797	218
2028	$75 - 156	5 - 9	9	2,298	625
2029	$75 - 155	4 - 9	9	2,229	602
2030	$75 - 155	4 - 9	9	2,163	580
2031	$85 - 173	5 - 10	10	2,368	634
2032	$103 - 210	6 - 12	11	2,808	750
2033	$106 - 214	6 - 12	11	2,796	745
2034	$111 - 223	6 - 13	12	2,855	759
2035	$112 - 225	6 - 12	12	2,820	748
2036	$116 - 233	6 - 13	12	2,848	758
2037	$119 - 238	6 - 13	12	2,845	760
2038	$128 - 255	7 - 14	13	2,974	797
2039	$123 - 243	6 - 13	12	2,775	746
2040	$116 - 230	6 - 12	11	2,568	693
2041	$108 - 213	5 - 11	10	2,336	632
2042	$107 - 211	5 - 11	10	2,273	618
2043	$113 - 222	6 - 11	10	2,356	643
2044	$101 - 198	5 - 10	9	2,060	564
2045	$90 - 175	4 - 9	8	1,792	492
2046	$79 - 154	4 - 7	7	1,552	428
2047	$75 - 145	4 - 7	6	1,444	399

2048	$76 - 147	4 - 7	6	1,439	399
2049	$66 - 128	3 - 6	6	1,237	344
2050	$58 - 111	3 - 5	5	1,064	297
2051	$49 - 95	2 - 4	4	912	254
2052	$42 - 82	2 - 4	3	781	218
2053	$36 - 70	2 - 3	3	669	187
2054	$31 - 60	1 - 3	3	573	160
2055	$27 - 51	1 - 2	2	492	137
Cumulative or NPV	**$1,909 – $3,806**	**101 - 203**	**190**	**45,130**	**12,189**

The health impacts of the proposed rollback of the Tier 4 Standards under EDF's high BEV and Default Scenario are shown in Table 14. Health impacts are lower than under the EDF low BEV sales scenario due to the lower level of ICEVs affected by the Tier 4 PM standards, as shown in Table 8.

Table 14: Health Impacts of Proposed Rollback of Tier 4 PM Standards (million $2024 or incidence) – EDF High BEV and Default Scenario

Calendar Year	Monetized Benefits ($ million)	Premature Mortality	ER and Hospital Visits	Asthma Symptoms	Lost School and Work Days
2027	$14 - 28	1 - 2	2	422	115
2028	$52 - 108	3 - 7	6	1,597	434
2029	$52 - 108	3 - 6	6	1,549	418
2030	$52 - 107	3 - 6	6	1,503	403
2031	$57 - 117	3 - 7	6	1,601	429
2032	$72 - 147	4 - 8	8	1,956	522
2033	$73 - 148	4 - 8	8	1,932	515
2034	$77 - 156	4 - 9	8	1,989	529
2035	$77 - 156	4 - 9	8	1,949	517
2036	$81 - 162	4 - 9	8	1,984	528
2037	$82 - 164	4 - 9	8	1,955	522
2038	$89 - 177	5 - 9	9	2,072	555
2039	$85 - 169	4 - 9	8	1,934	520
2040	$81 - 160	4 - 8	8	1,792	483
2041	$76 - 149	4 - 8	7	1,634	442
2042	$74 - 145	4 - 7	7	1,560	424
2043	$80 - 156	4 - 8	7	1,651	450
2044	$71 - 139	3 - 7	6	1,445	396

2045	$63 - 123	3 - 6	6	1,258	346
2046	$56 - 108	3 - 5	5	1,091	301
2047	$52 - 100	2 - 5	4	998	276
2048	$53 - 103	2 - 5	4	1,013	281
2049	$46 - 90	2 - 4	4	872	242
2050	$41 - 78	2 - 4	3	750	209
2051	$35 - 67	2 - 3	3	644	180
2052	$30 - 58	1 - 3	2	552	154
2053	$26 - 49	1 - 2	2	473	132
2054	$22 - 42	1 - 2	2	406	113
2055	$19 - 36	1 - 2	2	348	97
Cumulative or NPV	**$1,324 – $2,640**	**70 - 142**	**132**	**31,386**	**8,478**

The projected health impacts from the proposed rollback of the Tier 4 PM standards under EDF's low BEV and Early Option Scenario are shown in Table 15. These health impacts are more than 50% higher than those assuming manufacturers comply under the EPA Default Scenario.

Table 15: Health Impacts of Proposed Rollback of Tier 4 PM Standards (million $2024 or incidence) – EDF Low BEV and Early Option Sensitivity

Calendar Year	Monetized Benefits ($ million)	Premature Mortality	ER and Hospital Visits	Asthma Symptoms	Lost School and Work Days
2027	$36 - 76	2 - 5	4	1,120	307
2028	$106 - 220	6 - 13	13	3,239	881
2029	$106 - 219	6 - 13	13	3,143	849
2030	$106 - 218	6 - 13	12	3,050	818
2031	$120 - 247	7 - 14	14	3,371	902
2032	$149 - 304	8 - 18	17	4,055	1,083
2033	$152 - 309	9 - 18	17	4,030	1,074
2034	$159 - 321	9 - 18	17	4,103	1,091
2035	$161 - 323	9 - 18	17	4,044	1,073
2036	$166 - 333	9 - 18	17	4,070	1,083
2037	$170 - 339	9 - 18	17	4,050	1,081
2038	$181 - 360	10 - 19	18	4,208	1,127
2039	$173 - 343	9 - 18	17	3,924	1,055
2040	$164 - 325	8 - 17	16	3,633	980
2041	$153 - 302	8 - 15	14	3,318	898
2042	$153 - 300	8 - 15	14	3,236	880

2043	$162 - 317	8 - 16	15	3,355	915
2044	$145 - 284	7 - 14	13	2,961	811
2045	$130 - 254	6 - 12	11	2,600	715
2046	$116 - 226	6 - 11	10	2,276	627
2047	$110 - 214	5 - 10	9	2,131	589
2048	$112 - 217	5 - 10	9	2,130	591
2049	$99 - 191	5 - 9	8	1,850	515
2050	$87 - 168	4 - 8	7	1,606	448
2051	$75 - 145	3 - 7	6	1,390	388
2052	$65 - 125	3 - 6	5	1,200	335
2053	$56 - 108	3 - 5	5	1,036	289
2054	$48 - 94	2 - 4	4	895	250
2055	$42 - 81	2 - 4	3	773	216
Cumulative or NPV	**$2,748 – $5,477**	**145 - 293**	**274**	**64,845**	**17,519**

The projected health impacts of the Proposal under EDF's high BEV and Early Option Sensitivity are shown in Table 16.

Table 16: Health Impacts of Proposed Rollback of Tier 4 PM Standards (million $2024 or incidence) – EDF High BEV and Early Option Sensitivity

Calendar Year	Monetized Benefits ($ million)	Premature Mortality	ER and Hospital Visits	Asthma Symptoms	Lost School and Work Days
2027	$24 - 49	1 - 3	3	728	199
2028	$82 - 169	5 - 10	10	2,493	678
2029	$82 - 169	5 - 10	10	2,420	654
2030	$81 - 168	5 - 10	9	2,348	630
2031	$91 - 187	5 - 11	10	2,557	684
2032	$116 - 236	7 - 14	13	3,144	840
2033	$117 - 238	7 - 14	13	3,108	828
2034	$123 - 249	7 - 14	13	3,178	845
2035	$124 - 249	7 - 14	13	3,115	826
2036	$129 - 258	7 - 14	13	3,149	838
2037	$130 - 260	7 - 14	13	3,103	829
2038	$140 - 278	7 - 15	14	3,249	870
2039	$134 - 265	7 - 14	13	3,029	814
2040	$127 - 251	7 - 13	12	2,807	757
2041	$119 - 234	6 - 12	11	2,569	696
2042	$117 - 230	6 - 12	11	2,478	673
2043	$125 - 246	6 - 12	11	2,603	710

2044	$113 - 221	6 - 11	10	2,304	631
2045	$102 - 198	5 - 10	9	2,029	558
2046	$91 - 177	4 - 9	8	1,781	491
2047	$85 - 166	4 - 8	7	1,653	457
2048	$88 - 170	4 - 8	7	1,671	464
2049	$78 - 150	4 - 7	6	1,456	405
2050	$69 - 132	3 - 6	6	1,267	354
2051	$59 - 115	3 - 5	5	1,099	307
2052	$51 - 99	2 - 5	4	951	265
2053	$45 - 86	2 - 4	4	823	230
2054	$39 - 74	2 - 3	3	712	199
2055	$33 - 64	2 - 3	3	617	172
Cumulative or NPV	**$2,124 – $4,232**	**112 - 226**	**212**	**50,175**	**13,557**

The health impacts of a full repeal of the Tier 4 Standards under EDF's low BEV scenario are shown in Table 17. Unsurprisingly, these impacts are vastly larger than those for the proposed rollback in the Tier 4 standards. If EPA repeals the standards, more than 7,200 lives could be lost prematurely by 2055 and cost our nation more than $145 billion in health harms.

Table 17: Health Impacts of a Full Repeal of the Tier 4 PM Standards (million $2024 or incidence) – EDF Low BEV and Default Scenario

Calendar Year	Monetized Benefits ($ million)	Premature Mortality	ER and Hospital Visits	Asthma Symptoms	Lost School and Work Days
2027	$19 - 41	1 - 2	2	601	165
2028	$59 - 123	4 - 7	7	1,809	492
2029	$135 - 278	8 - 17	16	3,994	1,079
2030	$327 - 675	19 - 40	38	9,430	2,530
2031	$528 - 1082	30 - 63	60	14,768	3,953
2032	$745 - 1519	42 - 87	83	20,268	5,412
2033	$982 - 1992	55 - 113	107	25,998	6,926
2034	$1278 - 2581	71 - 145	136	32,975	8,766
2035	$1582 - 3181	86 - 176	165	39,816	10,561
2036	$1908 - 3821	103 - 209	195	46,697	12,428
2037	$2245 - 4480	119 - 241	225	53,501	14,286
2038	$2609 - 5187	137 - 276	257	60,568	16,227
2039	$2979 - 5903	154 - 310	288	67,435	18,126
2040	$3375 - 6665	173 - 346	321	74,547	20,102

2041	$3754 - 7395	190 - 379	351	81,180	21,976
2042	$4129 - 8114	206 - 410	380	87,463	23,769
2043	$4502 - 8826	222 - 441	407	93,457	25,495
2044	$4868 - 9521	237 - 470	434	99,084	27,133
2045	$5253 - 10251	253 - 500	461	104,893	28,831
2046	$5603 - 10910	267 - 526	485	110,087	30,351
2047	$5938 - 11537	279 - 550	508	114,827	31,753
2048	$6263 - 12144	291 - 572	529	119,252	33,075
2049	$6579 - 12729	303 - 593	550	123,363	34,315
2050	$6904 - 13332	314 - 614	570	127,555	35,585
2051	$7084 - 13681	322 - 630	585	130,888	36,515
2052	$7244 - 13989	330 - 645	598	133,837	37,338
2053	$7386 - 14264	336 - 657	610	136,466	38,071
2054	$7513 - 14509	342 - 669	620	138,813	38,726
2055	$7628 - 14730	347 - 679	630	140,927	39,316
Cumulative or NPV	**$74,479 – $145,530**	**3665 - 7264**	**6,741**	**1,542,773**	**423,272**

The health impacts of a full repeal for EDF's high BEV scenario are shown in Table 18. While these estimates are slightly lower than the low BEV scenario, they are still incredibly significant.

Table 18: Health Impacts of a Full Repeal of the Tier 4 PM Standards (million $2024 or incidence) – EDF High BEV and Default Scenario

Calendar Year	Monetized Benefits ($ million)	Premature Mortality	ER and Hospital Visits	Asthma Symptoms	Lost School and Work Days
2027	$21 - 44	1 - 3	3	659	181
2028	$78 - 163	5 - 10	10	2,398	652
2029	$142 - 293	8 - 18	17	4,212	1,137
2030	$318 - 655	19 - 39	37	9,162	2,458
2031	$503 - 1031	29 - 60	57	14,068	3,765
2032	$697 - 1422	40 - 82	77	18,969	5,065
2033	$908 - 1843	51 - 105	99	24,049	6,407
2034	$1174 - 2370	65 - 133	125	30,282	8,050
2035	$1439 - 2893	79 - 160	150	36,220	9,607
2036	$1720 - 3444	93 - 188	176	42,096	11,204
2037	$2010 - 4011	107 - 216	202	47,898	12,790
2038	$2319 - 4609	122 - 245	228	53,825	14,420
2039	$2624 - 5199	136 - 273	254	59,393	15,964

2040	$2950 - 5826	151 - 302	280	65,160	17,571
2041	$3256 - 6414	164 - 328	304	70,404	19,059
2042	$3561 - 6997	178 - 354	327	75,422	20,497
2043	$3857 - 7562	190 - 378	349	80,073	21,844
2044	$4140 - 8097	202 - 400	369	84,272	23,077
2045	$4439 - 8662	214 - 423	390	88,636	24,363
2046	$4703 - 9158	224 - 442	408	92,409	25,477
2047	$4956 - 9628	233 - 459	424	95,831	26,500
2048	$5196 - 10073	242 - 475	439	98,922	27,436
2049	$5421 - 10489	249 - 489	453	101,656	28,277
2050	$5653 - 10916	257 - 503	467	104,436	29,135
2051	$5757 - 11118	262 - 512	475	106,373	29,676
2052	$5843 - 11283	266 - 520	483	107,947	30,115
2053	$5915 - 11422	269 - 526	488	109,277	30,486
2054	$5971 - 11530	272 - 531	493	110,310	30,774
2055	$6011 - 11609	273 - 535	496	111,062	30,984
Cumulative or NPV	**$62,685 – $122,567**	**3,094 – 6,136**	**5,696**	**1,305,233**	**357,827**

IV. EDF's Analysis of the Emissions and Health Impacts of Changes to the Tier 4 Standards for Medium-duty Vehicles

The impact of the Proposal or repeal of the Tier 4 standards for medium-duty vehicles (MDVs) differs somewhat from that for LDVs and LDTs because all MDVs are above 6,000 pounds GVWR. For MDVs, the default compliance scenario for the Tier 4 standards does not take effect until MY2031 and at 100% of sales. The Early Option compliance scenario begins in MY2027 like it does for heavy LDTs. However, the number of vehicles required to meet the Tier 4 standards under this option is more stretched out, starting with 20% in 2027 and increasing by 20% each year until it reaches 100% in 2031.

EPA assumed that manufacturers will choose to comply using the default schedule. Thus, the full effect of the Tier 4 standards should be reflected in the difference in emissions between 2030 and 2031 model year vehicles in MOVES5. EDF compared the VOC, NOx, and PM emissions from 2030 and 2031 MDVs in the MOVES5.R3 output to the changes in the standards. We evaluated emissions from: 1) pickups and vans and 2) single unit trucks, as their emission impacts in MOVES5.R3 differed. We grouped motor homes with single unit trucks as their emissions are relatively small. As the Tier 4 impacts in MOVES5.R3 for 2031 often fall short of the Tier 4 standards, we also show the MOVES5.R3 impacts for 2037. EDF also only included gasoline-fueled MDVs in the PM comparisons as diesel MDVs are already equipped with PM traps. The results are shown in Table 19.

Table 19: Impacts of the Tier 4 Standards Relative to MY2030 Zero-Mile MDV Emissions VOC and NOx Emission Impacts in MOVES5.R3 and Tier 4 Standards										
	MOVES5.R3		MOVES5 Technical Report		MOVES5.R3				MOVES5 Technical Report	
	VOC		NOx		VOC+ NOx				PM (Gasoline)	
	Model Year 2031									
Pickups and Vans	-43%		-43%		-43%		-61%		80%	75-99%
Single Unit Trucks and Motor Homes	-29%		-29%		-29%		-61%		72%	75-99%
	Model Year 2037									
Pickups and Vans	-45%		-64%			-56%		-61%	80%	75-99%
Single Unit Trucks and Motor Homes	-61%		-71%			-67%		-61%	73%	75-99%

Starting with NMOG+NOx emissions, the impacts of the Tier 4 standards reflected in MOVES5.R3 fall well short of the change in emissions presented in Table 3-66 of the MOVES5 Technical Report cited earlier. In contrast, the MOVES5.R3 impacts in 2037 for VOC+NOx bracket the 61% reduction stated in the MOVES5 documentation. It is unclear why the impacts of the Tier 4 standards on VOC+NOx emissions from MDVs doesn't reach its full impact until several model years after 2031. However, EDF believes that the impacts in 2037 reflect the full phase-in of the Tier 4 standards. Thus, any use of MOVES5.R3 directly will underestimate the impact of the Tier 4 standard on VOC+NOx emissions from MDVs.

In contrast, MOVES5.R3 shows the same reductions in PM emissions in 2031 as 2037. The MOVES5 documentation presents a range of effectiveness values for GPFs (75-99%) depending on the type of vehicle operation involved. For LDVs and LDTs, as indicated above, the average effectiveness of GPFs on PM emissions was 95%. For MDVs, the average appears to be 80% for pickups and vans and 72% for single unit trucks and motor homes. An average of 80% falls within the range stated by EPA. However, 72% does not. Due to the short period of time allowed for comments, EDF could not find and utilize the distribution of MDV driving assumed by MOVES5.R3. Thus, absent more detailed analysis, we accept the 80% average effectiveness for

gasoline pickup and vans as an acceptable effect of adding GPFs. However, given that the average cannot be as low as 72%, we believe that 80% would be a more acceptable value for single unit trucks and motor homes.

Thus, EDF made two changes to the MOVES5.R3 output for MDV emissions to better reflect the impact of the Tier 4 standards. For VOC+NOx emissions, we substituted the VOC and NOx emission factors for model year 2037 by age for those of 2031-2036 MDVs. For PM emissions, we reduced the PM emissions from 2031 and later model year single unit trucks and motor homes by 28.5% ((1 – (1 - 20%)) / (1 – (1 - 28%))) in order to reflect an average GPF efficiency of 80% instead of 72%.

The Proposal does not impact MDV emissions under the default compliance option. However, it would under the Early Option compliance option. Under this latter compliance option, EDF assumed that MY2027-2030 vehicles required to comply with the Tier 4 standards were equipped with GPFs and their PM emissions decreased by 80%. The proposal would then remove these reductions for 2027 and 2028 model year vehicles. The sales of MD BEVs is relatively small. Therefore, EDF ignored the effect of BEVs on the percentage of MDVs required to meet the PM standard under the alternative compliance option.

To estimate the emissions impact of a full repeal of the Tier 4 standards on MDVs, we adjusted the VOC+NOx and PM emission factors for 2031 and later model year vehicles by age to reflect the emission factors for the 2030 model year.

Table 20 below shows the impact of the Proposal and a potential full repeal of the MDV Tier 4 standards on NOx, VOC and PM emissions. A rollback of the MDV standards under the Proposal, which is only affected in the Early Option scenario, would result in a cumulative increase in NOx, VOC, and PM emissions of more 12,000 tons, 6,500 tons, and 600 tons, respectively. EDF estimated the impact of the full repeal under the EDF Default scenario only and found total emissions increases through 2055 of more than 352,000 tons of NOx, 207,000 tons of VOCs and 20,000 tons of PM.

Table 20: Emission Impacts of Proposed Rollback and Full Repeal of MDV Tier 4 Standards (U.S. tons per year)

	Proposal – EDF Early Option			Full Repeal – EDF Default Option		
Calendar Year	NOx	VOC	PM	NOx	VOC	PM
2027	260	126	10	-	-	-
2028	802	399	29	-	-	-
2029	790	396	28	-	-	-
2030	780	394	28	-	-	-
2031	805	395	32	1,225	677	49
2032	852	394	42	2,450	1,358	103
2033	824	389	40	3,680	2,045	158

2034	823	408	38	4,926	2,744	215
2035	763	384	36	6,324	3,476	299
2036	704	363	34	7,658	4,177	383
2037	642	338	32	9,059	4,996	465
2038	581	320	30	10,389	5,777	545
2039	519	288	27	11,655	6,544	623
2040	459	257	24	12,844	7,267	696
2041	400	227	22	13,942	7,975	767
2042	344	199	20	14,960	8,633	833
2043	293	174	18	15,868	9,227	894
2044	248	149	16	16,684	9,769	950
2045	224	135	14	17,428	10,267	1,002
2046	201	121	13	18,099	10,727	1,051
2047	181	110	12	18,695	11,141	1,096
2048	164	103	11	19,263	11,535	1,140
2049	145	91	10	19,787	11,899	1,180
2050	127	80	9	20,252	12,229	1,217
2051	110	70	8	20,685	12,550	1,254
2052	95	60	7	21,081	12,845	1,288
2053	81	52	6	21,441	13,114	1,320
2054	68	44	5	21,767	13,360	1,349
2055	57	37	4	22,066	13,585	1,377
Cumulative	**12,344**	**6,506**	**604**	**352,228**	**207,917**	**20,255**

EDF used the output from the same COBRA runs described above to project the health impacts of the Proposal under the early option compliance scenario and a full repeal of the MDV standards. However, to better reflect the MDV fleet, we used the COBRA projections for heavy-duty vehicles (HDVs) instead of LDVs. For VOC and NOx emission impacts, we used the average of the COBRA projections for gasoline and diesel HDVs, as they differed by less than 2%. For PM emission impacts, we used the COBRA projections for gasoline HDVs. All monetized health benefits assume a 2% discount rate and the net present values shown use 2%.

Using our adjusted Tier 4 emission factors with the MOVES5.R3 output, EDF calculated the health impacts of the proposed rollback of the MDV NMOG+NOx standards under EPA's Early Option compliance schedule. Table 21 shows the cumulative health costs could be as high as $1.6 billion by 2055. And more than 80 people could die prematurely from PM- and ozone-related health harms.

Table 21: Health Impacts of Proposed Rollback of MDV Tier 4 NMOG+NOx Standards (million $2024 or incidence) – EDF Early Option Sensitivity					
Calendar Year	Monetized Benefits ($ million)	Premature Mortality	ER and Hospital Visits	Asthma Symptoms	Lost School and Work Days
2027	$24 - 30	1.4 - 1.7	3.5	1,217	688
2028	$77 - 97	4.3 - 5.5	11	3,802	2,150
2029	$79 - 99	4.4 - 5.6	11	3,785	2,141
2030	$81 - 102	4.4 - 5.7	11	3,780	2,139
2031	$87 - 108	4.7 - 5.9	11	3,917	2,224
2032	$94 - 118	5 - 6.4	12	4,152	2,367
2033	$94 - 117	4.9 - 6.3	12	4,039	2,312
2034	$97 - 121	5 - 6.4	12	4,060	2,334
2035	$93 - 115	4.7 - 6	11	3,785	2,184
2036	$88 - 109	4.4 - 5.6	10	3,510	2,026
2037	$83 - 102	4.1 - 5.2	10	3,219	1,859
2038	$77 - 95	3.8 - 4.7	9	2,928	1,692
2039	$70 - 87	3.4 - 4.3	8	2,630	1,520
2040	$64 - 79	3.1 - 3.8	7	2,336	1,350
2041	$57 - 70	2.7 - 3.4	6	2,045	1,182
2042	$50 - 61	2.3 - 2.9	5	1,771	1,024
2043	$43 - 53	2 - 2.5	5	1,514	876
2044	$37 - 46	1.7 - 2.1	4	1,289	746
2045	$34 - 42	1.6 - 1.9	4	1,172	678
2046	$31 - 39	1.4 - 1.8	3	1,058	612
2047	$29 - 35	1.3 - 1.6	3	957	554
2048	$26 - 32	1.1 - 1.4	3	869	503
2049	$24 - 29	1 - 1.3	2	772	447
2050	$21 - 26	0.9 - 1.1	2	680	394
2051	$18 - 22	0.8 - 1	2	591	343
2052	$16 - 19	0.7 - 0.8	2	510	296
2053	$13 - 16	0.6 - 0.7	1	436	253
2054	$11 - 14	0.5 - 0.6	1	367	213
2055	$9 - 12	0.4 - 0.5	1	305	177
Cumulative or NPV	**$1,264 – $1,569**	**64 - 81**	**152**	**51,391**	**29,465**

EDF also calculated the health impacts related to the rollback of the Tier 4 PM standards under EPA's early option. Table 22 shows that by 2055, the Proposal could result in an additional nearly

30 premature deaths and could cost our nation an additional $551 million cumulatively through 2055.

Table 22: Health Impacts of Proposed Rollback of MDV Tier 4 PM Standards (million $2024 or incidence) – EDF Early Option Sensitivity					
Calendar Year	Monetized Benefits ($ million)	Premature Mortality	ER and Hospital Visits	Asthma Symptoms	Lost School and Work Days
2027	$4 - 8	0.2 - 0.5	0.5	118	32
2028	$12 - 25	0.7 - 1.5	1.5	366	98
2029	$12 - 26	0.7 - 1.5	1.4	359	96
2030	$13 - 26	0.7 - 1.5	1.4	354	94
2031	$15 - 31	0.9 - 1.8	1.7	417	110
2032	$20 - 42	1.2 - 2.4	2.2	547	145
2033	$20 - 41	1.1 - 2.3	2.2	523	138
2034	$20 - 40	1.1 - 2.2	2.1	502	132
2035	$19 - 39	1.0 - 2.1	2.0	475	125
2036	$19 - 37	1.0 – 2.0	1.9	449	118
2037	$18 - 36	1.0 - 1.9	1.8	421	111
2038	$18 - 35	0.9 - 1.9	1.7	401	106
2039	$16 - 32	0.8 - 1.7	1.6	365	97
2040	$15 - 30	0.8 - 1.5	1.4	329	88
2041	$14 - 27	0.7 - 1.4	1.3	294	79
2042	$13 - 25	0.6 - 1.3	1.2	267	72
2043	$12 - 24	0.6 - 1.2	1.1	247	67
2044	$11 - 21	0.5 – 1.0	0.9	216	59
2045	$10 - 19	0.5 - 0.9	0.9	195	53
2046	$9 - 18	0.4 - 0.8	0.8	176	48
2047	$8 - 16	0.4 - 0.8	0.7	163	45
2048	$8 - 16	0.4 - 0.7	0.7	156	43
2049	$7 - 14	0.3 - 0.7	0.6	138	38
2050	$7 - 13	0.3 - 0.6	0.5	122	34
2051	$6 - 11	0.3 - 0.5	0.5	107	30
2052	$5 - 10	0.2 - 0.5	0.4	94	26
2053	$4 - 8	0.2 - 0.4	0.4	81	22
2054	$4 - 7	0.2 - 0.3	0.3	70	19
2055	$3 - 6	0.1 - 0.3	0.3	60	17
Cumulative or NPV	**$275 - $551**	**15 - 30**	**27.7**	**6,579**	**1,755**

EDF also calculated the health impacts of a full repeal of the Tier 4 standards for MDVs. Table 23 shows the health impacts if the Tier 4 NMOG+NOx standards are repealed, under EPA's default compliance timeline. EDF's analysis finds that by 2055, a repeal of the standards could result in an additional nearly 2,100 premature deaths, 3,900 more ER and hospital visits, 1.3 million more asthma incidences, and 745,000 more lost school and workdays. These health harms could cost our nation an additional $46 billion cumulatively through 2055.

Table 23: Health Impacts of Full Repeal of the MDV Tier 4 NMOG+NOx Standards (million $2024 or incidence) – EDF Default Scenario

Calendar Year	Monetized Benefits ($ million)	Premature Mortality	ER and Hospital Visits	Asthma Symptoms	Lost School and Work Days
2027	$0 - 0	0 - 0	-	-	-
2028	$0 - 0	0 - 0	-	-	-
2029	$0 - 0	0 - 0	-	-	-
2030	$0 - 0	0 - 0	-	-	-
2031	$136 - 169	7 - 9	17	5,987	3,402
2032	$280 - 349	14 - 18	35	12,031	6,863
2033	$434 - 540	22 - 28	53	18,154	10,397
2034	$598 - 744	30 - 38	72	24,415	14,037
2035	$790 - 981	39 - 50	93	31,470	18,162
2036	$983 - 1219	48 - 61	114	38,261	22,088
2037	$1194 - 1479	58 - 73	136	45,470	26,260
2038	$1405 - 1739	67 - 85	157	52,390	30,266
2039	$1616 - 1998	77 - 96	177	59,042	34,122
2040	$1826 - 2255	85 - 107	197	65,364	37,789
2041	$2023 - 2496	93 - 118	216	71,336	41,244
2042	$2215 - 2731	101 - 127	233	76,952	44,495
2043	$2396 - 2952	108 - 136	249	82,052	47,447
2044	$2569 - 3163	114 - 144	263	86,724	50,152
2045	$2734 - 3365	121 - 151	277	91,055	52,660
2046	$2884 - 3547	126 - 157	290	95,016	54,974
2047	$3026 - 3718	130 - 163	301	98,614	57,079
2048	$3165 - 3886	135 - 168	312	102,088	59,114
2049	$3300 - 4049	139 - 173	322	105,355	61,030
2050	$3428 - 4203	142 - 178	332	108,327	62,777
2051	$3502 - 4293	146 - 182	339	110,667	64,134
2052	$3569 - 4376	148 - 185	346	112,810	65,377
2053	$3631 - 4451	151 - 188	352	114,758	66,506
2054	$3687 - 4520	153 - 191	357	116,521	67,529

2055	$3738 - 4582	155 - 194	362	118,136	68,466
Cumulative or NPV	**$37,492 – $46,133**	**1,684 – 2,111**	**3,913**	**1,289,222**	**745,778**

As shown in Table 24, a full repeal of the MDV Tier 4 PM standards would result in additional health-related costs of up to $19 billion by 2055 and a possible additional 900 lives lost.

Table 24: Health Impacts of a Full Repeal of the MDV Tier 4 PM Standards (million $2024 or incidence) – EDF Default Scenario

Calendar Year	Monetized Benefits ($ million)	Premature Mortality	ER and Hospital Visits	Asthma Symptoms	Lost School and Work Days
2027	$0 - 0	0 - 0	-	-	-
2028	$0 - 0	0 - 0	-	-	-
2029	$0 - 0	0 - 0	-	-	-
2030	$0 - 0	0 - 0	-	-	-
2031	$24 - 49	1 - 3	3	637	168
2032	$51 - 105	3 - 6	5	1,341	354
2033	$82 - 166	4 - 9	9	2,071	546
2034	$114 - 231	6 - 13	12	2,825	743
2035	$164 - 330	9 - 18	17	3,963	1,040
2036	$217 - 434	11 - 23	21	5,093	1,342
2037	$271 - 541	14 - 28	26	6,214	1,643
2038	$327 - 650	17 - 34	31	7,303	1,938
2039	$384 - 761	19 - 39	36	8,366	2,228
2040	$441 - 871	22 - 44	40	9,380	2,507
2041	$497 - 980	25 - 49	45	10,369	2,783
2042	$552 - 1087	27 - 54	49	11,306	3,046
2043	$606 - 1189	29 - 58	53	12,172	3,293
2044	$658 - 1289	31 - 62	57	12,974	3,523
2045	$709 - 1385	33 - 66	60	13,723	3,741
2046	$757 - 1476	35 - 70	64	14,450	3,950
2047	$804 - 1564	37 - 73	67	15,124	4,146
2048	$850 - 1651	39 - 76	70	15,773	4,337
2049	$896 - 1736	40 - 79	73	16,390	4,519
2050	$940 - 1818	42 - 82	75	16,964	4,690
2051	$968 - 1873	43 - 84	78	17,472	4,831
2052	$994 - 1924	44 - 87	80	17,946	4,962

2053	$1019 - 1971	45 - 89	82	18,388	5,084
2054	$1041 - 2015	46 - 91	84	18,799	5,197
2055	$1063 - 2056	47 - 93	85	19,186	5,304
Cumulative or NPV	**$9,720 – $18,988**	**464 - 919**	**845**	**193,034**	**52,576**

APPENDIX 2: EDF ANALYSIS: NMOG+NOX AND PM CERTIFICATION DATA ANALYSIS

EDF Analysis: NMOG+NOx and PM Certification Data Analysis

July 6, 2026

EPA relies heavily on an argument that OEMs do not have enough leadtime to comply with the MY 2027 and MY 2028 Tier 4 standards in order to justify the Proposal. However, they provide no analysis of the current sales fleet to support their assertions. EDF examined the EPA and California Air Resources Board certification data to understand the current state of the LDV fleet.

To understand where internal combustion engine (ICE) vehicles are for NMOG+NOx emissions, EDF used EPA's publicly accessible vehicle certification database. [1,2] The conclusion of the analysis, described in detail below, is that manufacturers are well-positioned to comply with the MY 2027 and MY 2028 Tier 4 NMOG+NOx standards. The existing flexibilities of EPA's NMOG+NOx program also ensure manufacturers are well-positioned to comply, including the ability to use credit banks that OEMs have accumulated, purchasing credits from other manufacturers, and carrying forward a deficit.

EDF used the California Air Resources Board certification data to determine what models had gasoline particulate filters (GPFs). A growing share of models certified in California have GPFs with ten OEMs having models with GPFs.

Automakers are well-positioned to comply with Tier 4 NMOG+NOx standards.

EPA's vehicle certification results data includes what tests were performed, which entities performed them, the level of emissions measured during the test (column "Rounded Emission Result (g/mi)," referred to here as "test level"), the level of emissions at which each manufacturer is certifying their vehicle (column "Certification Level (g/mi)," referred to here as "certification level"), and the emissions bin to which they are certifying their vehicle (column "Emission Standard Level Code").

EDF conducted the following steps to process the certification data to better enable analysis. Because of the limited time allowed for the comment period, EDF focused on EPA certification data for the top 10 original equipment manufacturers (OEMs) which represent roughly 90% of sales. EDF focused on MY 2025 and 2026 light-duty vehicles (LDVs). We restricted the data to

[1] https://www.epa.gov/compliance-and-fuel-economy-data/annual-certification-data-vehicles-engines-and-equipment, Certified Vehicle Test Results Report Data (Model Years: 2014 – Present) (xlsx), Updated June 2026

[2]These data, while useful for this analysis, do not absolve EPA of the responsibility to provide data on automaker's compliance with NMOG+NOx standards. While this analysis is meaningful evidence of the likely ability for OEMs to comply with the MY2027 and 2028 standards, EPA should have made information such as production volumes and credit banks available.

just test results from the "Federal" certification region for NMOG+NOx. In addition, EDF included only the test fuels of E10 gasoline, regular and premium gasoline, and diesel.[3]

EPA determines the certification for each model based on a series of driving test cycles. The main group of drive cycles are referred to as the Federal Test Procedure (FTP).[4] Because fully electric vehicles do not emit NMOG + NOx, these vehicles are not included in the test results certification file.[5]

For each test submitted to EPA, manufacturers tested a "represented test vehicle" that applied to one or more carlines. EDF separated the list of carlines for each vehicle into their own entries to create a comprehensive list of the vehicle models for which certification data existed. EDF averaged the test level and certification level for all of the FTP tests for each model with identical characteristics.

Each entry includes a model with a specific MY, drivetrain, propulsion system (ex. HEV or gasoline), engine displacement, and trim. EDF calculated the percentage of models certifying at or below different thresholds of NMOG+NOx emissions (mg/mi).

EPA's model year 2025 and 2026 certification data shows that a significant proportion of light-duty models certify at low NMOG+NOx levels.

Contrary to EPA's claims that there is inadequate lead time to comply with the MY 2027 and MY 2028 Tier 4 standards, automakers already have a significant proportion of light-duty (LD) models that certify at low levels of NMOG+NOx. The percentage of models that certify to low levels of NMOG+NOx has increased with each model year. For example, the percentage of tested LD models that certified to emissions levels of 25 mg/mi or less, equivalent to the MY 2027 standard under Tier 4, increased from 61.0% of MY 2025 models to 68.3% of MY 2026 models.[6] This trend is true across vehicle classes and manufacturers.

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[3] The exhaustive list of fuels included includes 'Tier 3 E10 Regular Gasoline (9 RVP @Low Alt.)', 'Tier 3 E10 Premium Gasoline (9 RVP @Low Alt.)', 'Tier 2 Cert Gasoline', 'Federal Cert Diesel 7-15 PPM Sulfur', 'CARB LEV3 E10 Regular Gasoline', 'CARB LEV4 E10 Regular Gasoline', 'CARB LEV4 E10 Premium Gasoline', 'CARB LEV3 E10 Premium Gasoline', and 'CARB Phase II Gasoline']. EDF excluded CNG, LPG, and E85 to focus on high-production car models.

[4] Tests that fall under the FTP are the Federal fuel 3-day exhaust, California fuel 2-day exhaust (with can load), California fuel 3-day exhaust, and CVS 75 and later (without can. load).

[5] One example is Tesla, which is one of the top 10 OEMs by sales, but not included in this analysis.

[6] The certification data currently only includes a small number of MY 2027 models. Because it is not likely that this sample is representative, EDF focused on MY 2025 and 2026. It is very possible that the share of models with low levels of NMOG+NOx will continue to increase in MY 2027.

Table 1: Cumulative percentage of ICE LD models with average FTP certification levels at or below different NMOG+NOx thresholds (mg/mi) across MYs 2025-2026 (1,031 models)

	NMOG+NOx thresholds (mg/mi)						
MY	10	15	20	25	30	35	40
2025	1.5%	15.8%	47.5%	61.0%	67.7%	73.5%	82.9%
2026	1.0%	23.9%	52.6%	68.3%	75.7%	78.5%	85.5%

Almost a quarter (23.9%) of MY2026 models certified at or below 15 mg/mi, up from 15.8% for MY2025. Additionally, an increasing share of all models are certified at or below 40 mg/mi, including 85.5% for MY 2026. OEM compliance with NMOG+NOx is assessed as a fleetwide average. Fewer higher emitting models that need to be balanced in the fleetwide averaging makes it easier for OEMs to meet a fleetwide average of 25 mg/mi for MY2027 and 23 mg/mi in MY2028.

All LD vehicle types have models that certify to low levels of NMOG+NOx.

EPA's certification data reveals that automakers are able to certify models of lighter and heavier light-duty vehicle classes at low levels of NMOG+NOx.

Table 2: Vehicle Classes categorization table

Class	**Vehicle Weight Rating(s)[7] (lbs)**	**Federal Highway Administration Class**
LDV/PV	GVW < 8,500	Class 1 or Class 2a Passenger Vehicle
LDT1	LVW 0-3,750, GVW 0-6,000	Class 1
LDT2	LVW 3,751-5,750, GVW 0-6,000	Class 1
LDT3	ALVW 3,751-5,750, LVW 0-3,750, GVW 6,001-8,500	Class 2a
LDT4	ALVW > 5,750, LVW 0-3,750, GVW 6,001-8,500	Class 2a

Vehicles classified as LDV, which includes passenger vehicles ranging from the Nissan Altima Gasoline Model with an engine size of 2.5L to the Honda Pilot Gasoline Model with an engine size of 3.5L, improved from 59.5% of MY 2025 vehicles certifying at or below 25 mg/mi to 73.6% of MY 2026 vehicles certifying at or below that threshold. Light-duty trucks are classified by both their Gross Vehicle Weight (GVR) and their Loaded Vehicle Weight (LVW). LDT4 vehicles, or the heaviest class of light-duty trucks, including models such as the Toyota 4Runner and the Toyota Tacoma, improved from 36.4% certifying at or below 25 mg/mi for MY 2025 to

[7] LVW refers to Loaded Vehicle Weight; GVW refers to Gross Vehicle Weight; ALVW refers to Adjusted Loaded Vehicle Weight. All acronyms can be found on Vocabulary Catalog | US EPA. The Federal Highway Administration (FHWA) uses a different set of classes than EPA. Class 1 vehicles have a GVW < 6000 lbs, whereas Class 2 vehicles have a GVW 6,001-10,000 lbs. A comparison table can be found at Alternative Fuels Data Center: Maps and Data - Vehicle Weight Classes and Categories.

51.2% in MY 2026. Altogether, automakers have demonstrated an ability to improve NMOG+NOx certification levels for vehicles, regardless of vehicle class.

Table 3: Cumulative Percentage of MY 2025 ICE LD models with average certification levels at or below different NMOG+NOx thresholds (mg/mi) by Vehicle Class (533 models)

MY25	NMOG+NOx thresholds (mg/mi)						
Class	10	15	20	25	30	35	40
LDV	2.9%	17.0%	45.1%	60.7%	68.0%	70.9%	76.7%
LDT1	0.0%	40.0%	86.7%	100.0%	100.0%	100.0%	100.0%
LDT2	1.7%	14.9%	76.0%	85.1%	85.1%	90.1%	93.4%
LDT3	0.0%	22.3%	36.9%	48.5%	55.3%	73.8%	93.2%
LDT4	0.0%	2.3%	19.3%	36.4%	52.3%	52.3%	68.2%
Total	1.5%	15.8%	47.5%	61.0%	67.7%	73.5%	82.9%

Table 4: Cumulative Percentage of MY 2026 ICE LD models with average certification levels at or below different NMOG+NOx thresholds (mg/mi) by Vehicle Class (498 models)

MY26	NMOG+NOx thresholds (mg/mi)						
Class	10	15	20	25	30	35	40
LDV	1.0%	25.9%	52.8%	73.6%	77.2%	78.8%	81.3%
LDT1	0.0%	25.0%	58.3%	91.7%	100.0%	100.0%	100.0%
LDT2	2.8%	36.1%	74.1%	85.2%	88.0%	92.6%	94.4%
LDT3	0.0%	24.3%	40.8%	51.5%	69.9%	73.8%	95.1%
LDT4	0.0%	2.4%	37.8%	51.2%	59.8%	62.2%	69.5%
Total	1.0%	23.9%	52.6%	68.3%	75.7%	78.5%	85.5%

Low NMOG+NOx emissions are not limited to lighter vehicles with smaller engine sizes: GM's 2026 Sierra, Silverado, Suburban, Tahoe, and Yukon, which have an engine displacement of 5.3L, had certification emissions levels at or below 25 mg/mi. Overall, 62.6% of LD models with engine sizes of 3 to 4 liters certified at or below 25 mg/mg along with 64.0% of LD models with engine sizes of 5 to 6 liters.

Table 5: Cumulative Percentage of MY 2026 ICE LD models with average certification levels at or below different NMOG+NOx thresholds (mg/mi) by Engine Displacement (498 models)

MY 2026	NMOG+NOx thresholds (mg/mi)							
Eng_Disp (# of models)	5	10	15	20	25	30	35	40
1-2 L (150)	0.0%	1.3%	27.3%	64.7%	84.7%	90.0%	90.7%	91.3%
2-3 L (191)	0.0%	1.6%	27.7%	55.0%	69.6%	81.7%	84.8%	87.4%
3-4 L (99)	0.0%	0.0%	9.1%	44.4%	62.6%	68.7%	72.7%	81.8%
4-5 L (7)	0.0%	0.0%	0.0%	0.0%	28.6%	28.6%	28.6%	71.4%
5-6 L (25)	0.0%	0.0%	64.0%	64.0%	64.0%	64.0%	76.0%	84.0%
6+ L (26)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	57.7%

All of the major OEMs certify models at low levels of NMOG+NOx

Across the top 10 OEMs (excluding Tesla's zero-emission fleet), automakers have consistently demonstrated their ability to produce ICEV models with low levels of NMOG+NOx. Six of those nine OEMs have at least 70% of their LD models certified to 25 mg/mi or below for MY 2026. Across MY2025 and 2026, all manufacturers increased the percentage of their models certified at or below 25 mg/mi. For example, 73.3% of MY 2025 Hyundai LD models certified at or below 25 mg/mi, which increased by over 10%-points to 83.7% in MY 2026. As discussed above, certification data shows that most models were certified at or below 40 mg/mi.

Table 6: Cumulative percentage of MY 2025 ICE LD models with average FTP certification levels at or below different NMOG+NOx thresholds (mg/mi) by manufacturer (533 models)

	NMOG+NOx thresholds (mg/mi)						
	10	15	20	25	30	35	40
Ford	3.2%	9.7%	71.0%	80.6%	82.3%	85.5%	90.3%
GM	0.0%	14.3%	27.7%	40.2%	44.6%	61.6%	78.6%
Honda	0.0%	20.5%	64.1%	79.5%	82.1%	94.9%	100.0%
Hyundai	0.0%	22.2%	60.0%	73.3%	77.8%	82.2%	86.7%
Nissan	10.3%	33.3%	64.1%	74.4%	79.5%	79.5%	89.7%
Stellantis	0.0%	11.8%	39.2%	66.7%	80.4%	80.4%	88.2%
Subaru	0.0%	11.8%	47.1%	58.8%	64.7%	64.7%	64.7%
Toyota	2.0%	13.3%	58.2%	77.6%	90.8%	93.9%	94.9%
Volkswagen	0.0%	13.5%	21.6%	23.0%	28.4%	28.4%	48.6%

Table 7: Cumulative percentage of MY 2026 ICE LD models with average FTP certification levels at or below different NMOG+NOx thresholds (mg/mi) by manufacturer (498 models)

	NMOG+NOx thresholds (mg/mi)						
	10	15	20	25	30	35	40
Ford	4.2%	25.4%	66.2%	83.1%	83.1%	90.1%	94.4%
GM	0.0%	15.1%	29.2%	40.6%	57.5%	60.4%	77.4%
Honda	0.0%	32.4%	70.3%	86.5%	89.2%	94.6%	100.0%
Hyundai	0.0%	26.5%	63.3%	83.7%	89.8%	91.8%	95.9%
Nissan	0.0%	34.5%	55.2%	75.9%	86.2%	86.2%	100.0%
Stellantis	0.0%	9.1%	65.5%	80.0%	80.0%	80.0%	83.6%
Subaru	0.0%	23.5%	23.5%	64.7%	82.4%	82.4%	94.1%
Toyota	2.3%	43.0%	67.4%	82.6%	90.7%	93.0%	94.2%
Volkswagen	0.0%	8.3%	27.1%	35.4%	39.6%	41.7%	43.8%

The certification data demonstrates that OEMs are deploying more effective emissions control technologies not only in low-production models but also in some of the most popular vehicles on the market. Popular models such as MY 2025 and 2026 editions of Toyota's Hybrid RAV4 and Hybrid Camry; Honda's CR-V and Civic; Hyundai's Santa Fe Hybrid; Nissan's Altima and Rogue; Stellantis's Chrysler Pacifica; and Subaru's Crosstrek, had certification emissions levels at or below 25 mg/mi. As shown in Table 1, 68.3% of MY 2026 light-duty models certified at or below 25 mg/mi.

Table 8: Examples of models with low average FTP certification for NMOG+NOx (mg/mi) across MYs 2025 and 2026

		NMOG+NOx certification levels (mg/mi)		
Car Model	Engine Displacement	MY2025	MY2026	Average
Nissan Altima	2.5	8.0	11.0	9.5
Honda Civic 5Dr	2.0	10.5	10.5	10.5
Hyundai Santa Fe Hybrid	1.6	12.5	12.5	12.5
Volkswagen Tiguan	2.0	11.0	15.5	13.3
Ford Escape	1.5	16.5	12.0	14.3
Ford Escape	1.5	16.5	12.0	14.3
Toyota RAV4 Hybrid	2.5	16.0	13.0	14.5
GM Chevrolet Sierra	5.3	15.0	15.0	15.0
GM Chevrolet Suburban	5.3	15.0	15.0	15.0
Toyota Camry Hybrid	2.5	20.0	11.0	15.5
Nissan Rogue	1.5	12.0	20.5	16.3
Stellantis Chrysler Pacifica	3.6	14.0	20.0	17.0
Ford Bronco	2.3	14.0	20.0	17.0

Stellantis Chrysler Pacifica	3.6	14.0	20.0	17.0
Ford Bronco	2.3	14.0	20.0	17.0
Ford Explorer	3.0	17.0	18.0	17.5
Subaru Crosstrek	2.5	20.0	21.0	20.5
Toyota 4Runner	2.4	23.0	23.0	23.0

When models are assigned to Tier 4 bins, even with a margin, OEMs remain well positioned to comply with MY 2027 and 2028 standards.

Tier 4 provides OEMs with more granular bins to certify to, every 5 mg, compared to Tier 3 bins which are mostly every 20 mg.[8] To assign each vehicle to a Tier 4 bin, EDF multiplied the certification level by 1.3 and determined the closest bin above that emissions level.[9] This gives models at least a 30% margin over the certification level.

Five of the top nine manufacturers could certify more than half of their models to Bin25 or below.

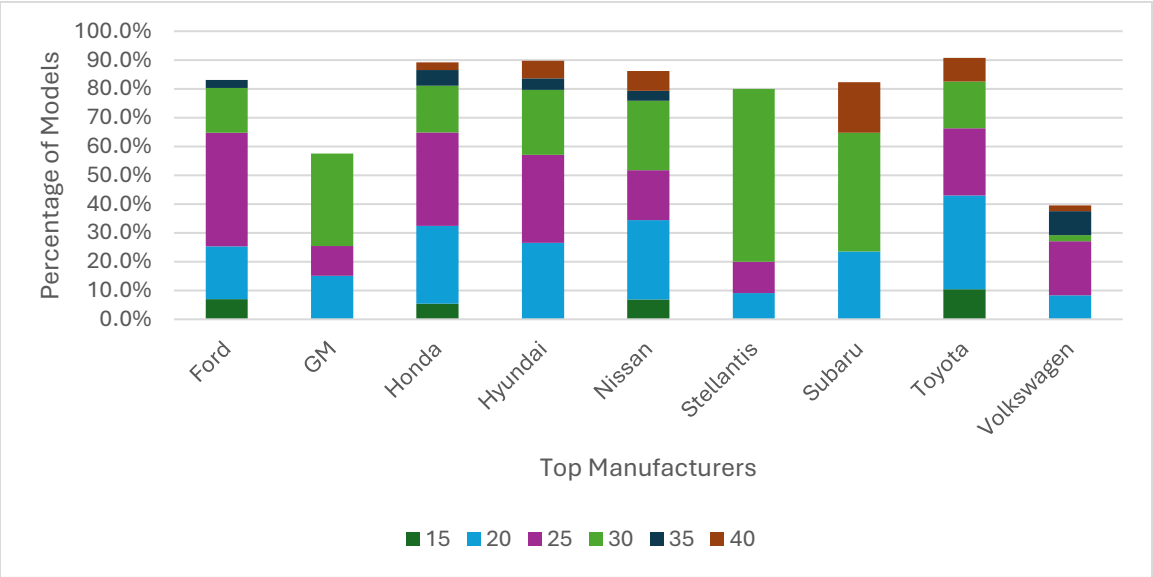
Table 9: Cumulative percentage of MY 2026 ICE LD models with Theoretical Bins at or below different NMOG+NOx thresholds (mg/mi) by manufacturer (30% margin) (498 models)

Theoretical bins (mg/mi)	15	20	25	30	35	40
Ford	7.0%	25.4%	64.8%	80.3%	83.1%	83.1%
GM	0.0%	15.1%	25.5%	57.5%	57.5%	57.5%
Honda	5.4%	32.4%	64.9%	81.1%	86.5%	89.2%
Hyundai	0.0%	26.5%	57.1%	79.6%	83.7%	89.8%
Nissan	6.9%	34.5%	51.7%	75.9%	79.3%	86.2%
Stellantis	0.0%	9.1%	20.0%	80.0%	80.0%	80.0%
Subaru	0.0%	23.5%	23.5%	64.7%	64.7%	82.4%
Toyota	10.5%	43.0%	66.3%	82.6%	82.6%	90.7%
Volkswagen	0.0%	8.3%	27.1%	29.2%	37.5%	39.6%
Total	3.6%	23.9%	45.2%	70.1%	72.3%	75.7%

[8] Tier 3 has Bin0, Bin20, Bin30, Bin50, Bin70, Bin125, and Bin160.

[9] To calculate the theoretical bin for each model, EDF took the FTP average certification emissions level, multiplied by 1.3, and rounded up to the nearest multiple of 5. For example, a 2025 Hyundai Santa Cruz AWD (2.5L Engine Displacement), which had an average FTP certification emissions level of 0.013 g/mi and the theoretical bin was (0.013 x 1.3), or 0.0169, raised to the nearest 5 mg, or 0.020 g/mi, which would be assigned a theoretical bin of 20 mg/mi.

Figure 1: Share of 2026 ICE models at different Theoretical Emissions Bins, up to 40 mg/mi (30% margin)

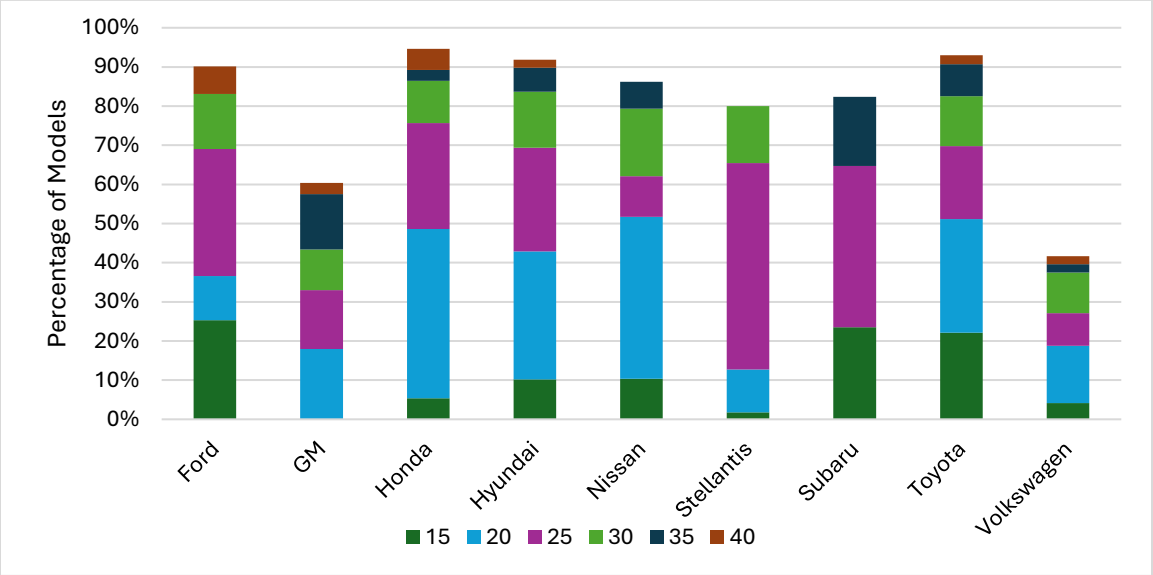


OEMs are well-positioned to certify models to MY2027 and MY2028 NMOG+NOx Tier 4 levels with a 30% margin added onto the certification emissions levels. However, 30% might be too high since the certification values already include an estimate of deterioration over its useful life. A margin of 15% should be more appropriate. If OEMs used 15% margin when choosing bins, a higher share of the models would certify to lower NMOG+NOx bins. For instance, 57.0% of MY 2026 models would certify at or below 25 mg/mi under a 15% margin, in comparison to 45.2% under a 30% margin.

Table 10: Cumulative percentage of MY 2026 ICE LD models with Theoretical Bins at or below different NMOG+NOx thresholds (mg/mi) by manufacturer with 15% margin (498 models)

	15	20	25	30	35	40
Ford	25.4%	36.6%	69.0%	83.1%	83.1%	90.1%
GM	0.0%	17.9%	33.0%	43.4%	57.5%	60.4%
Honda	5.4%	48.6%	75.7%	86.5%	89.2%	94.6%
Hyundai	10.2%	42.9%	69.4%	83.7%	89.8%	91.8%
Nissan	10.3%	51.7%	62.1%	79.3%	86.2%	86.2%
Stellantis	1.8%	12.7%	65.5%	80.0%	80.0%	80.0%
Subaru	23.5%	23.5%	64.7%	64.7%	82.4%	82.4%
Toyota	22.1%	51.2%	69.8%	82.6%	90.7%	93.0%
Volkswagen	4.2%	18.8%	27.1%	37.5%	39.6%	41.7%
Total	10.8%	32.7%	57.0%	69.3%	75.7%	78.5%

Figure 2: Share of 2026 ICE models at different Theoretical Emissions Bins, up to 40 mg/mi (15% margin)



EPA failed to consider how OEMs' deterioration factors impact their ability to comply with Tier 4 standards.

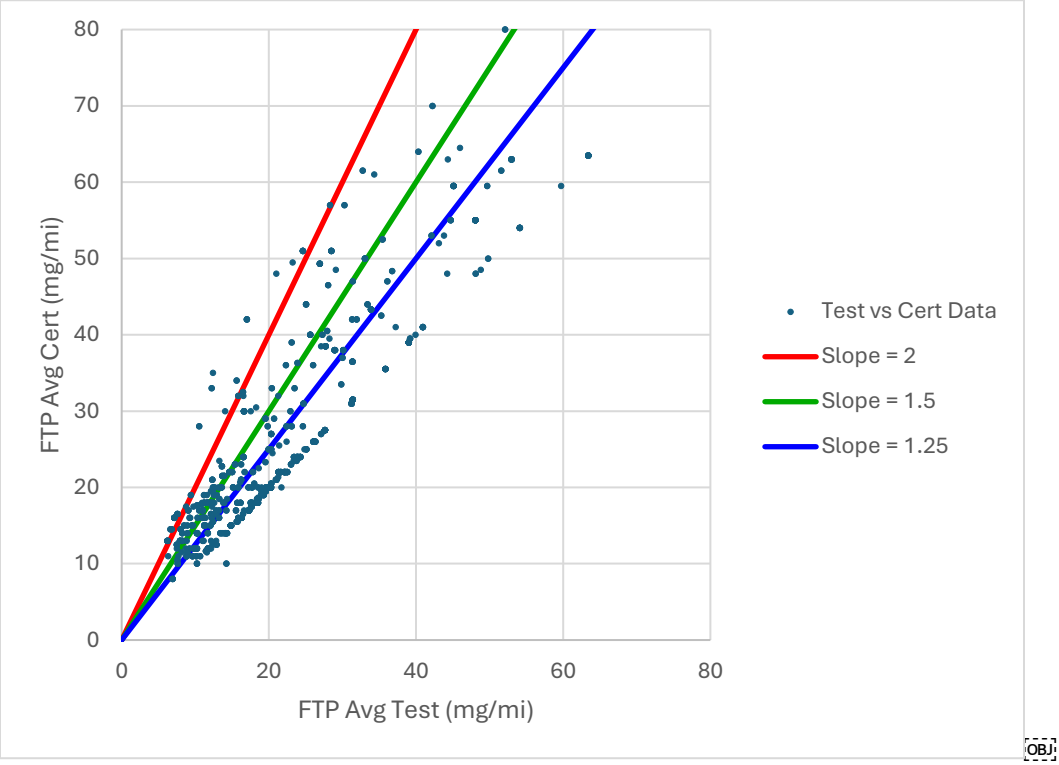
For certification, vehicles are tested when they essentially have 0 miles on their odometer, but OEMs need to certify the emissions level at what the vehicle will produce at 150,000 miles (also known as "full useful life"). Manufacturers expect deterioration over the course of a vehicle's lifetime, which varies depending on the conditions in which cars operate. As a result, there is a difference in most cases between the (new vehicle) "test" level and "certification" level at its full useful life, which is usually estimated with additive and/or multiplicative deterioration factors. However, OEMs (and vehicles) have considerably different certification to testing emissions ratios (as shown in Table 11 for OEMs), and models have an even wider range of ratios (as shown in Figure 3).

In EPA's assessment of feasibility, the Agency failed to consider how OEMs' adjustments to this ratio might impact their assessment of their ability to comply. For instance, while GM and Stellantis on average certified models at very close values to their test results for MYs 2025 and 2026, which suggests little deterioration, Toyota and Hyundai certified models at more than 1.5 times their test results. EPA fails to consider how the range of differences between certification levels and test results may affect OEMs' ability to meet Tier 4 standards. If some OEMs have shown their ability to certify vehicles with low levels of deterioration, it is possible that other OEMs may be able to do the same.

Table 11: Average ratio of certification level to test level for all LD models of the top OEMs

	2021	2022	2023	2024	2025	2026
Ford	1.81	1.79	1.58	1.47	1.14	1.16
GM	1.02	1.02	1.02	1.02	1.02	1.02
Honda	1.46	1.49	1.50	1.48	1.48	1.48
Hyundai	1.51	1.50	1.45	1.50	1.55	1.57
Nissan	1.22	1.24	1.21	1.20	1.16	1.16
Stellantis	1.47	1.32	1.22	1.07	1.03	1.06
Subaru	1.42	1.32	1.28	1.30	1.35	1.37
Toyota	1.44	1.45	1.55	1.64	1.57	1.56
Volkswagen	1.35	1.33	1.29	1.30	1.34	1.38

Figure 3: Average ratio of certification level to test level for all light-duty models of the top OEMs for MYs 2025 and 2026



Ten OEMs already have models with gasoline particulate filters certified in California

The California Air Resources Board's (CARB) *New Vehicle and Engine Certification* program issues Executive Orders (EOs) certifying the vehicles sold in California to their emission standards. Included in the EOs are the emission control technology for each vehicle tested, including whether a model has a gasoline particulate filter (GPF). EDF used the California EO data because EPA's certification data does not include which emission control technologies are on vehicles. EDF calculated the number of test groups and models by Model Year and by Manufacturer that included "GPF" as part of their Emissions Control Technology.[10]

The number of test groups with GPFs rose from 24 in MY 2025 to 41 in MY 2026. Additionally, the number of OEMs with GPFs on models increased from 8 in MY 2025 to 10 in MY 2026. Three of the top ten OEMs by sales nationally – Ford, Volkswagen, and Hyundai – have models with GPFs, demonstrating some mass-market installation of GPFs. For example, in MY 2026, nearly one-quarter of Ford test groups had GPFs. Volkswagen also had a high proportion, with 15.4% of test groups in MY 2026.

Table 12: Number of CARB test groups between MYs 2021-2027 with GPFs (2,670 total)

Model year	Total Test Groups	Test Groups with GPFs
2021	485	7
2022	462	10
2023	436	11
2024	425	11
2025	438	24
2026	395	41
2027	29	9

[10] GPF technology may include any of the following, per CARB EOs: GPF (Gasoline Particulate Filter), TWC+GPF (Three Way Catalyst + Gasoline Particulate Filter), WU-TWC+GPF (Warm Up Three Way Catalyst + Gasoline Particulate Filter), and CGPF (Coated Gasoline Particulate Filter). These data include instances where there are parallel GPFs (ex. 2GPF, 2(TWC+GPF)). The data in Model Data- No ZEV includes models with multiple variations of drivetrains, such as AWD and FWD, which have identical emissions control technologies. For this reason, we prioritize using the percentage of models with GPFs rather than the number to avoid double-counting.

Table 13: Number and Percentage of Test Group Vehicles with GPFs among all manufacturers in MY 2026

OEM	Test Groups Tested	Test Groups with GPFs	% of Test Groups with GPFs
Aston Martin	6	3	50.0%
BMW	28	8	28.6%
Porsche	15	4	26.7%
Ferrari	5	5	100.0%
Ford	48	11	22.9%
Hyundai	31	1	3.2%
Jaguar Land Rover	12	3	25.0%
Lotus	2	1	50.0%
Maserati	2	1	50.0%
Volkswagen	26	4	15.4%
Total among OEMs with GPFs	175	41	
Other	220	0	
Total, including all models tested	395	41	

Similar to the EPA certification data, OEMs in California certify test groups where only one representative vehicle needs to be tested, and multiple models certify using that test vehicle data. For example, one test group corresponded to three models of a 2026 Ford Explorer with 3.0L engine size, all with different trims or drivetrains, and two models of a 2026 Lincoln Aviator with 3.0L engine size of different drivetrains. EDF calculated how many models certified in California contained GPFs. The number of models with GPFs grew from 41 in MY 2024 to 152 in MY 2026. Only 183 of likely around 1,500 models have been certified in California for MY 2027 so far, but already 43 of them contain GPFs.

GPFs are installed in many popular vehicles sold today, such as the 2026 F150 Pickup, 2026 Ford Mustang, 2025 Volkswagen Taos, 2026 Hyundai Palisade Hybrid, and 2027 Kia Telluride.

Table 14: Number of Models with GPFs among all manufacturers from MY 2021-2027 (9,914 models)

Model year	Total Models	Models with GPFs
2021	2,028	20
2022	1,945	26
2023	1,791	36
2024	1,642	41
2025	1,473	71
2026	1,507	152
2027	183	43
Total	9,914	385

Table 15: Number of Models with GPFs among all manufacturers in MY 2026

OEM	Total Models	# of Model with GPFs
Aston Martin	27	3
BMW	113	41
Porsche	58	22
Ferrari	18	18
Ford	196	39
Hyundai	52	3
Jaguar Land Rover	33	8
Kia	32	0
Lotus	4	3
Maserati	11	3
Volkswagen	64	10
Total (Of OEMS That Include GPFs)	608	150
Other	804	0
Total, Including OEMS With No GPFs	1,412	150

Table 16: Examples of Models in MYs 2025-2027 with GPF technology installed among top OEMs

MY	Manufacturer	Vehicle Make	Vehicle Model
2025-2026	Ford	Ford	Maverick
2025-2026	Volkswagen	Audi	Q5 Quattro
2025-2026	Volkswagen	Volkswagen	Tiguan
2025-2026	Volkswagen	Volkswagen	Taos
2026	Ford	Lincoln	Aviator
2026	Ford	Ford	Ranger
2026	Ford	Ford	F150 HEV
2026	Ford	Ford	Bronco Sport
2026	Ford	Ford	Nautilus
2026	Ford	Ford	F150 Pickup
2026	Ford	Ford	Mustang
2027	Volkswagen	Volkswagen	Atlas
2026-2027	Ford	Ford	Expedition
2026-2027	Hyundai	Hyundai	Palisade Hybrid