Institute for Policy Integrity
NEW YORK UNIVERSITY SCHOOL OF LAW

September 27, 2021

To: Environmental Protection Agency

Subject: Comments on "Revised 2023 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions Standards," 86 Fed. Reg. 43,726 (Aug. 10, 2021)

Docket ID: EPA-HQ-OAR-2021-0208

The Institute for Policy Integrity at New York University School of Law ("Policy Integrity")[1] respectfully submits the following comments on the Environmental Protection Agency's ("EPA") notice of proposed rulemaking, *Revised 2023 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions Standards* ("Proposed Rule"),[2] which proposes to revise EPA's final rule entitled *The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks*[3] ("SAFE 2").

Policy Integrity is a non-partisan think tank dedicated to improving the quality of government decisionmaking through advocacy and scholarship in the fields of administrative law, economics, and public policy. Concerning EPA's proposed emissions standards for light-duty vehicles in model years ("MY") 2023-2026, Policy Integrity makes these recommendations:

- **EPA should select the alternative that will maximize net social welfare and promote distributional justice.** EPA's analysis shows that Alternative 2 will generate $180 billion in net monetized benefits ($40 billion more than the proposed program), plus additional unmonetized benefits. Further analysis of the option to increase the stringency of MY 2026 standards will most likely reveal such increased stringency is cost-benefit justified as well. EPA also finds that increased standards will generally promote equity and so are appropriate. EPA should carefully assess whether a more tailored application of any of its credit extensions would further increase net benefits and equity while still preserving sufficient flexibility for manufacturers.
- **EPA can rely on legislative and regulatory history to help justify its approach to lead time.** Through history, Congress and EPA have balanced the availability of compliance options against the necessary lead time. When existing technologies and flexibilities readily enable compliance, EPA has discretion to determine that relatively shorter lead time is sufficient.
- **EPA should affirm that strong standards help correct market failures that prevent consumers from achieving valuable fuel savings on their own.** The SAFE 2 Rule distorted its balancing of factors based on unsupported assumptions about consumer valuations. EPA now correctly balances those factors, but should go further to highlight additional market failures that interfere with consumers purchasing optimal levels of fuel economy on their own, and should conclude that standards are necessary to help correct at least some persistent market failures.
- **EPA has begun to make appropriate changes to its modeling approach, but further adjustments in the future would more fully capture the benefits of strong standards.** Notably,

[1] This document does not purport to represent the views, if any, of New York University School of Law.

[2] 86 Fed. Reg. 43,726 (Aug. 10, 2021) (Docket No. EPA-HQ-OAR-2021-0208).

[3] 85 Fed. Reg. 24,174 (Apr. 30, 2020) (Docket No. EPA-HQ-OAR-2018-0283).

EPA's return to an assumed 10% rebound effect is appropriate. Going forward, EPA should revise the sales and scrappage models to be more consistent with real-world purchasing behaviors, such as moving to a long-run sales elasticity estimate and correcting the assumption that consumers will indefinitely continue to irrationally value only 2.5 years of fuel savings.

I. EPA Should Select the Alternative That Will Maximize Net Social Welfare and Promote Distributional Justice, Consistent with Its Statutory Mandate and Executive Orders

Section 202 of the Clean Air Act instructs EPA to balance its mandate to safeguard "public health and welfare" with an "appropriate" consideration of costs.[4] In the Proposed Rule, EPA correctly recognizes that a finding of significant net benefits "reinforces" its conviction that it is "appropriate[ly] weighing . . . the statutory factors and other relevant considerations."[5] Moreover, the executive order that instructed EPA to revise the SAFE 2 Rule reminded agencies to simultaneously advance the interests of public health, the environment, justice, workers, and communities.[6] A related presidential memorandum, issued the same day, reaffirmed the principles of Executive Orders 12,866 and 13,563[7]—including that agencies should select regulatory alternatives that "maximize net benefits" while also accounting for distributive impacts and equity.[8] EPA should follow these principles in setting its vehicle standards.

Unlike the net costly SAFE 2 Rule, which would increase emissions and jeopardize public welfare, EPA's Proposed Rule will reduce emissions and increase net social welfare and so is justifiable. However, EPA's analysis shows that Alternative 2 would result in net monetized benefits nearly 30% higher than EPA's proposed standards,[9] not to mention significant unmonetized climate, health, and environmental benefits that would likely further increase Alternative 2's advantages over the proposed program. (Note also that a variety of methodological changes, such as correcting the sales elasticity estimate as described below, could further strengthen the case in favor of Alternative 2.) Thus, following EPA's own interpretation of how best to balance the factors under Section 202, as well as principles for rational rulemaking under longstanding executive orders, EPA should select Alternative 2 to maximize net social welfare. Notably, comparing technology costs to fuel savings also suggests that Alternative 2 may have greater net benefits for individual consumers.[10] Given EPA's findings that lower-income families benefit more from net fuel savings,[11] Alternative 2 should also advance equity goals.

While EPA has not analyzed the expected costs and benefits of making the MY 2026 standards more stringent by 5–10 grams/mile,[12] this alternative would likely also result in even higher net benefits. EPA

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4 42 U.S.C. §§ 7521(a)(1)–(2).

5 86 Fed. Reg. at 43,786.

6 Exec. Order 13,990 §§ 1, 2(a)(ii), 86 Fed. Reg. 7037, 7037 (signed Jan. 20, 2021; published Jan. 25, 2021).

7 Memorandum on Modernizing Regulatory Review, 86 Fed. Reg. 7223, 7223 (signed Jan. 20, 2021; published Jan. 26, 2021).

8 Exec. Order 12,866 § 1(a), 58 Fed. Reg. 51,735, 51,735 (Oct. 4, 1993).

9 86 Fed. Reg. at 43,743, tbl.15 (at a 3% discount rate, $180 billion versus $140 billion).

10 Discounted at 3% over calendar years 2021–2050, the proposal has $210 billion in technology costs versus $250 in fuel savings (a difference of $40 billion), while Alternative 2 has $240 billion in technology costs versus $290 in fuel savings (a difference of $50 billion); at 7%, the proposal has $130 billion in technology costs versus $120 billion in fuel savings (-$10 billion), while Alternative 2 has $150 billion in technology costs versus $150 billion in fuel savings (even). EPA, *Revised 2023 and Later Model Year Light-Duty Vehicle GHG Emissions Standards: Regulatory Impact Analysis* at tbls.6-1, 6-3, 6-4, 6-6 (2021) [hereinafter "DRIA"]. Alternative 2 also has more consistently net-positive non-GHG emissions benefits. *Compare id*. at 7-26, tbl.7-5 (showing some years with net negative sums for the Proposed Rule), *with id.* at 7-28, tbl.7-7 (showing no such years for Alternative 2).

11 86 Fed. Reg. at 43,737.

12 *Id*. at 43,731.

should conduct such an analysis, and if it finds that Alternative 2, with the additional 5–10 g/mile adjustment for MY 2026, would maximize net benefits and be most consistent with EPA's statutory directives to protect and enhance national air quality, and to promote public health and welfare,[13] EPA should select that combination of policy options.

EPA should similarly analyze the relative distributional effects of Alternative 2 plus the 5–10 g/mile increase for MY 2026 as compared to the Proposed Rule.[14] EPA should consider the economic effects to lower-income households as well as the environmental justice effects from changes to criteria and toxic pollution, and the environmental justice gains associated with the increased climate benefits from more stringent alternatives.[15] If Alternative 2 plus the 5–10 g/mile increase for MY 2026 is consistent with equity goals as well as with EPA's statutory mandates and with maximizing net benefits, that would further strengthen the case for selecting that combination of policy options.

EPA argues that its proposed standards are preferable to Alternative 2 largely because "EPA believes a lower level of stringency increase for 2023 may be appropriate taking into consideration lead time."[16] EPA has considerable discretion to balance multiple factors in assessing lead time, as the next section of these comments explores. But even if EPA believes that lead time considerations favor a less stringent standard for MY 2023, that logic does not necessarily extend beyond MY 2023. To the extent EPA believes it cannot adopt Alternative 2 due to lead time considerations, EPA should explore a new alternative that combines the proposed standards' target for MY 2023 with Alternative 2's emissions targets for MY 2024 and MY 2025, followed by the 5–10 g/mile increase for MY 2026.

Similarly, EPA should also more critically evaluate the trade-offs resulting from its proposed extension of multiplier credits and the credit carry-forward period and consider the forgone benefits to public health and consumer fuel savings associated with these compliance flexibilities. To the extent that these extended compliance flexibilities are intended to provide additional lead time for manufacturers to comply with the MY 2023 standards, EPA should evaluate whether such flexibility is needed beyond the first model year of its proposed standards. As detailed below, we do not believe EPA is required to provide significant lead time for standards (such as the proposed standards) that do not require significant technology investment and development. EPA should consider whether scaling back even some of the multiplier credits or carry-forward period, or limiting their application to MY 2023, would increase net social benefits while still preserving more than enough compliance flexibility to satisfy the requirement for lead time.

II. EPA Can Finalize Its Proposed Standards with Adequate Lead Time for the 2023 Model Year, Consistent with Prior Standards

Under Clean Air Act Section 202(a), emission standards may take affect "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."[17] Thus, when setting

[13] *See* 42 U.S.C. § 7401(b)(1).

[14] *See* Jack Lienke et al., *Making Regulations Fair: How Cost-Benefit Analysis Can Promote Equity and Advance Environmental Justice* (Policy Integrity Report, 2021), https://policyintegrity.org/files/publications/Making_Regulations_Fair_2021.08.31.pdf (for guidance on integrating such an analysis).

[15] *See* Iliana Paul et al., *Improving Environmental Justice Analysis: Executive Order 12,898 and Climate Change* (Policy Integrity Report 2021), https://policyintegrity.org/publications/detail/improving-environmental-justice-analysis (on the distributional effects of climate change).

[16] 86 Fed. Reg. at 43,777.

[17] 42 U.S.C. § 7521(a)(2).

new standards, EPA must consider—among other factors—how much lead time is necessary for automakers to comply with new standards. "Lead time" is generally understood to be the time period between a new standard being finalized and the beginning of the relevant model year to which the standard applies. The model year varies by manufacturer production cycle and by vehicle model, since it starts on either January 2 of the preceding calendar year or "when any vehicle or engine within the engine family is first produced" (whichever is later), and ends on either December 31 of the year for which the model year is designated or when "the last such vehicle or engine is produced" (whichever is sooner).[18] This provides automakers with significant flexibility in setting their production schedules to comply with upcoming standards.[19] Thus, automakers could begin producing vehicles subject to the proposed MY 2023 standards as early as January 2, 2022, though they also have flexibility to delay the start of their production periods as needed in anticipation of regulatory standards and other factors.[20]

The Clean Air Act does not require a specific number of days or months for lead time. Instead, EPA has the discretion to balance what is required of manufacturers by any particular regulatory standard versus the time to comply and determine in its judgment how much lead time is necessary. When previous standards have required significant investment in new technologies and could not be achieved with existing technology, EPA has provided somewhat longer lead times in the past. But if a new standard can already be met with existing technology, without extensive redesign of powertrains and engine lines, EPA has the discretion to provide much shorter lead times. Here, EPA has properly exercised its discretion to determine how much lead time is necessary given existing compliance options, and has acted consistently with its historical regulation of vehicle tailpipe emissions.

A. Congress Provided EPA With Significant Discretion to Determine Appropriate Lead Time

The statutory history and structure suggest that EPA should balance lead time against how technology-forcing its standards are, so when compliance options are readily available, a shorter lead time is permissible. When drafting the Clean Air Act, Congress sought to confront the problems of an automotive industry that previously had no obligation or incentive to reduce its emissions. Congress understood that state-of-the-art pollution controls would not be developed "until some sort of regulation took it by the hand and gave it a good pull."[21] So Congress crafted a statutory scheme that would require EPA to regulate through the "drastic medicine" of setting stringent standards that would "force the state of the art."[22] Through the technology-forcing structure in Title II of the Clean Air Act, Congress readily demonstrated its intent for EPA "to project future advances in pollution control capability . . . [and] 'press for the development and application of improved technology rather than be

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[18] 40 C.F.R. § 85.2304(a).

[19] *See* 59 Fed. Reg. 48,664, 48,696–97 (Sept. 22, 1994) (citing EPA Advisory Circular 6B and describing regulatory history for definition of "model year," and specifically noting that the "model year" definition was designed to give manufacturers flexibility).

[20] *Id.* at 48,697 ("EPA believes these definitions [of model year], and the fact that the production period is based on specific models within engine families, provide vehicle manufacturers the maximum flexibility in terms of adjusting the model year designation of their product line to marketing needs and product changes. By permitting the designation of specific engine families, or models within families, as 'pull ahead' model year families without affecting the remainder of the vehicles in the model year they are presently building, a manufacturer will be able, for example, to launch a new vehicle as a 1995 model year vehicle while the remainder of their models are being produced as 1994 models.").

[21] *Int'l Harvester Co. v. Ruckelshaus*, 478 F.2d 615, 623 (D.C. Cir. 1973) (quoting *Hearing before the Subcomm. on Air & Water Pollution*, 90th Cong., 1155–56 (1967)).

[22] *Id.* at 623 (quoting Remarks of Sen. Edmund Muskie, 116 Cong. Rec. 33,120 (1970)).

limited by that which exists today.'"[23] Congress instructed EPA in 1970 that it must set standards for MY 1975 that would reduce hydrocarbons and carbon monoxide emissions by more than 90% compared to MY 1970 levels,[24] and set future standards to take effect "after such period as the Administrator finds necessary to permit the development and application of the requisite technology."[25] Congress directed EPA to consider lead time when setting standards because it expected EPA to set stringent standards that would require the development of new emissions controls. Over more than five decades of mobile source regulation since then, EPA has drastically reduced automotive emissions. And it has indeed done so by issuing standards that have sometimes asked automakers to "do what seems to be impossible."[26]

But EPA's proposed standards here do not ask the same of automakers. Instead, the current proposal seeks to remedy a misguided, arbitrary rollback[27] by re-proposing standards for MY 2023 that are equivalent to, or even less stringent than, those that were set almost a decade ago[28]—standards with which many vehicle models already comply. This hardly presents a situation where automakers need significant lead time to rework their product lines. Given the discretion granted to EPA, the agency need not "provide detailed solutions to every engineering problem" or "rebut all speculation that unspecified factors may hinder [meeting the standard]" when evaluating adequate lead time.[29] Rather, EPA "need only identify the major steps necessary for development . . . and give plausible reasons for its belief that the industry will be able to solve those problems in the time remaining."[30] Here, EPA has provided a more than sufficient explanation in the Proposed Rule for why the agency expects automakers to be able to meet its proposed MY 2023 standards.

Indeed, given that a significant percentage of the MY 2021 automotive fleet *already* meets the MY 2023 proposed fleet average standard,[31] EPA's analysis is far from a "'crystal ball' inquiry,"[32] but rather is based on a reasonable assessment of the domestic automotive fleet. In addition, EPA is providing multiple new flexible compliance options for automakers, including extending the availability of credits generated in MYs 2016–2020, extending multiplier credits, and expanding the off-cycle credits program. These extended flexibilities come on top of other existing flexibilities, like credit trading, the large bank of available credits,[33] and the carryback period for compliance. Further, five automakers (and more than one-third of domestic automotive sales) since 2019 have been in compliance with a framework agreement with California to voluntarily meet emission targets for MY 2023 that are equivalent to EPA's new proposed standards. Indeed, EPA could easily increase the standards' stringency, especially for MYs

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[23] *Nat. Res. Def. Council v. U.S. Env't Prot. Agency*, 655 F.2d 318, 328 (D.C. Cir. 1981) (quoting S. Rep. No. 1196, at 24 (1970)).

[24] *Int'l Harvester*, 478 F.2d at 623.

[25] Clean Air Act Amendments, Pub. L. No. 91-604, § 202(a)(2), 84 Stat. 1676, 1690 (Dec. 31, 1970) (codified as amended at 42 U.S.C. § 7521(a)(2)).

[26] 116 Cong. Rec. 32,901–02 (1970) (statement of Sen. Edmund Muskie).

[27] *See generally* Brief for Inst. for Pol'y Integrity as Amicus Curiae, *Competitive Enter. Inst. v. Nat'l Highway Traffic Safety Admin.*, No. 20-1145 (D.C. Cir. Jan. 21, 2021).

[28] 86 Fed. Reg. at 43,739 fig.2 (showing the Proposed Standards as slightly weaker than—and Alternative 2 as equivalent to—the 2012 standards for MY 2023).

[29] *Nat. Res. Def. Council*, 655 F.2d at 333–34.

[30] *Id.* at 333.

[31] DRIA, *supra* note 10, at 2-16 tbl.2-8.

[32] *Nat. Res. Def. Council*, 655 F.2d at 328 (quoting *Int'l Harvester*, 478 F.2d at 629).

[33] *See* EPA, *The 2020 EPA Automotive Trends Report: Greenhouse Gas Emissions, Fuel Economy, and Technology Since 1975: Executive Summary* ES-11 (2021) [hereinafter *2020 Automotive Trends*] ("[T]here remains a large bank of credits for future years.").

2024–2026, and, if it retains sufficient flexible compliance options, still determine that "the development and application of the requisite technology"[34] already exists.

B. EPA Has Historically Provided Lead Time in Proportion to Necessary Technology Development

The lead time that EPA can provide when it finalizes these proposed standards will hardly be an outlier in comparison to its previous rules. EPA will likely finalize standards for MY 2023 in late 2021 or early 2022, and EPA has issued new tailpipe standards mere months before a new model year begins on numerous occasions. For example, EPA finalized standards for MY 1975 light-duty trucks in August 1973, noting in its discussion of lead time that roughly fifty percent of models available in the MY 1973 truck fleet were already capable of meeting the new MY 1975 standards, that EPA believed automakers would be able to meet the MY 1975 standard in time, and that there was "no evidence to suggest that any manufacturer would be required to utilize [new technology] to meet these standards."[35] Likewise, EPA finalized heavy-duty truck standards for MY 1979 in September 1977.[36] EPA noted that automakers did not object to the short lead time provided to meet the MY 1979 emission standards because they "could be met by all of the manufacturers with the use of currently available emission control technology."[37]

When EPA has provided exemptions in consideration of short lead time, it has been because of limitations in compliance testing procedures, rather than technological feasibility. For example, EPA finalized high-altitude standards for MY 1982 in October 1980,[38] explicitly rejecting calls for additional lead time from automakers because EPA did not believe major hardware or retooling was necessary to meet the standards.[39] But, given the complexities in certifying engines for high altitude performance, EPA permitted a one-year exemption for thirty percent of an automaker's high altitude fleet based solely on the "availability of testing facilities" and "available personnel"—not on technological feasibility.[40] And EPA's judgment regarding technological feasibility was correct, as the agency noted in a subsequent rulemaking that "[t]he adequacy of the 9-month leadtime is now apparent from the fact that manufacturers' scheduled introduction dates for 1982 model year vehicles were not adversely affected."[41]

More recently, EPA issued the first-ever greenhouse gas standards for light duty vehicles for MYs 2012–2016 in May 2010, noting that it believed seven months of lead time before MY 2012 began was appropriate because "the vast majority of technology required by this final rule is commercially available" and the "vast majority of the emission reductions which will result from this final rule will be produced from the increased use of these technologies."[42] And, again, EPA's judgment on lead time was confirmed when automakers easily met the MY 2012 standards and even outperformed the standards

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[34] 42 U.S.C. § 7521(a)(2).

[35] 38 Fed. Reg. 21,362, 21,363 (Aug. 7, 1973)*; see also, e.g.*, 35 Fed. Reg. 17,288 (Nov. 10, 1970) (MY 1972 standards issued in November 1970).

[36] 42 Fed. Reg. 45,132 (Sept. 8, 1977).

[37] *Id.* at 45,134.

[38] 45 Fed Reg. 66,984 (Oct. 8, 1980).

[39] *Id.* at 66,691.

[40] *Id.*

[41] 48 Fed. Reg. 1418, 1421 (Jan. 12, 1983).

[42] 75 Fed. Reg. 25,324, 25,445 (May 7, 2010).

by 11 g/mile industrywide.[43] Indeed, a trade group for automotive dealerships suggested during the next round of rulemaking that EPA was providing *too much* lead time when it issued standards for MY 2017 in 2012.[44]

Conversely, when EPA has finalized standards further in advance of the affected model year, those standards typically required a longer lead time in order to develop and implement new emission control technologies across the fleet. For example, in February 2000, EPA issued stringent hydrocarbon and oxides of nitrogen standards for MY 2004 and beyond, which were designed to significantly reduce vehicle emissions in order to attain and maintain the national ambient air quality standard for ozone.[45] And EPA applied the same flat standard across all passenger cars, light trucks, and larger passenger vehicles.[46] These standards included a lengthy lead time in light of the ultimate goal to reduce emissions by more than 90% by 2009, requiring "widespread applications of upgraded and improved technology across the fleet."[47]

As discussed above, a significant portion of existing models already meet the proposed MY 2023 standard, and EPA believes automakers will be able to meet the fleet average standards without significant development of new electric vehicles, but instead with increased application of conventional technologies already developed for internal combustion vehicles, in combination with multiple flexible compliance options.[48] To the extent automakers choose to comply with the standards by selling more electric vehicles, many have already made voluntary pledges to do so independently of these standards.[49]

Further, a number of factors make it easier for manufacturers to comply with these proposed standards than various past standards that may have necessitated somewhat lengthier lead times.

First, these standards are in the form of a fleet average rather than requiring individual compliance for each vehicle model, a significant flexibility not provided for most of EPA's earlier light duty vehicle standards.[50] When EPA enacted the first greenhouse gas emissions standards for passenger vehicles in 2010, it noted that it was using fleet averaging because it "resolve[d] issues of lead-time or technical feasibility, allowing EPA to set a standard that is either numerically more stringent or goes into effect earlier than could have been justified otherwise[,] . . . increas[ing] flexibility and reduc[ing] costs for the regulated industry."[51] The fleetwide averaging and trading provisions built into the Proposed Rule offer

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[43] EPA, EPA-420-D-16-900, *Draft Technical Assessment Report: Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022–2025* at 3-14 (2016) at 3-14, https://nepis.epa.gov/Exe/ZyPDF.cgi/P100OXEO.PDF?Dockey=P100OXEO.PDF [hereinafter "Draft TAR"].

[44] 77 Fed. Reg. 62,624, 62,637 (Oct. 15, 2012) ("The National Automobile Dealers Association (NADA) opposed the MYs 2017–2025 proposed standards, arguing that the agencies should delay rulemaking since they believe there was no need to set standards so far in advance . . . .").

[45] *See* 65 Fed. Reg. 6698, 6698 (Feb. 10, 2000).

[46] *Id.*

[47] *Id.* at 6742.

[48] 86 Fed. Reg. at 43,777; DRIA, *supra* note 10, at 2-15 to 2-16.

[49] DRIA, *supra* note 10, at 2-13 to 2-15.

[50] *See* 75 Fed. Reg. 25,324, 25,412 (May 7, 2010) (explaining that EPA uses fleet averaging in only a few contexts, including the Tier 2 NO_x light duty standards, motorcycles, and heavy duty diesel vehicles; starting in 2010, EPA adopted fleet averaging for greenhouse gas standards).

[51] *Id.* at 25,412–13; *see also* 48 Fed. Reg. 33,456, 33,456 (July 21, 1983) (finalizing EPA's first averaging program for diesel vehicles "as part of the Agency's effort to ease the regulatory burden on the automotive industry without sacrificing environmental objectives. Implementation of this program should allow makers of light-duty diesel vehicles and light-duty

critical flexibilities that justify EPA's approach to lead time. In addition, the Proposed Rule provides for size- and sales-based standards that are not the same across the entire vehicle fleet. Rather, automakers have targets unique to their fleet and sales mix depending on the size of the models produced by that manufacturer in that model year, with larger vehicles subject to less stringent standards than smaller vehicles.[52] And since that target is not determined until the model year is over and final production numbers are available, each automaker can set its own path based on its own individual production plans—unlike earlier standards that required automakers to rework their production schedule ahead of time to ensure every engine family individually met its flat tailpipe emission standards.[53] Yet even when EPA in the past required more stringent flat standards that applied to all individual vehicles, the agency still issued numerous standards with mere months of lead time—further supporting that the Proposed Rule here, with its flexible footprint-based fleet average standard, does not necessitate significant lead time.

Second, manufacturers have access to significantly more compliance flexibilities under the Proposed Rule than they did under EPA's past criteria pollutant standards, including credit trading, credit multipliers, a large bank of available credits, and credit carryback provisions that allow automakers to make up for any possible shortfalls in earlier model years by increasing their efforts in subsequent years. Thus, even if automakers do not quite meet the MY 2023 standards, they have several years of lead time to adjust their production in MYs 2024–2026 and apply any credits earned in those years backwards to MY 2023. In addition, automakers are sitting on a significant bank of credits earned in past model years that can be applied toward any shortfalls in MY 2023[54] (and indeed, EPA has proposed extending the lifetime of those credits to provide *even more* flexibility[55]).

As demonstrated by the examples provided above, the anticipated finalization of these proposed standards in the near future will be consistent with the lead time provided for other MYs throughout EPA's regulatory history, and reflects a proper use of EPA's discretion to provide shorter lead times when compliance requires less technological development and investment. Indeed, the significantly more flexible form of these standards provides evidence that even less lead time is necessary here than EPA may have provided historically for standards that did not contain the multiple complex flexibilities offered now.

III. EPA Should Affirm that Strong Standards Help Correct Market Failures that Prevent Consumers from Achieving Valuable Fuel Savings on Their Own

In the Final Rule, EPA should offer much stronger conclusions about its approach to consumer valuation. First, EPA should clarify that, whereas the SAFE 2 Rule distorted its balancing of long-term savings versus upfront costs in ways grossly inconsistent with economic practices, regulatory precedent, and statutory mandates, EPA now properly balances the appropriate factors consistent with best economic practices. Second, EPA should conclude that there is considerable evidence that multiple market failures contribute to consumers purchasing less vehicle efficiency than would benefit them, and so there is a

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diesel trucks greater flexibility in meeting the 1985 particulate standards. Averaging allows manufacturers to control some vehicles more and others less, so long as average emissions comply with standards.").

[52] *See* 75 Fed. Reg. at 25,333 (describing reasoning for adopting footprint-based standards in EPA's first GHG tailpipe rule).

[53] *See, e.g.*, 42 Fed. Reg. at 45,132 ("Every manufacturer of new motor vehicle engines subject to the standards prescribed in this section shall . . . test or cause to be tested motor vehicle engines in accordance with applicable procedures . . . to ascertain that such test engines meet the [exhaust emission standard] requirements . . . .")

[54] EPA, *2020 Automotive Trends*, *supra* note 33, at 103–08.

[55] *See* 86 Fed. Reg. at 43,733.

clear role for regulations to correct these market failures. Third, EPA should reiterate that the constant performance assumption built into its analytical model obviates the need to estimate any potential lost consumer welfare from forgone attributes—which would, in any case, likely be small and offset by countervailing effects.

A. The SAFE 2 Rule Distorted Its Balancing of Factors Based on Unsupported Assumptions About Consumer Valuations; EPA Now Correctly Balances the Factors

EPA's Proposed Rule is far too generous in characterizing the SAFE 2 Rule as merely "balancing the[] factors" by "plac[ing] greater weight" on upfront costs as compared to long-term fuel savings,[56] public health gains, and other benefits to social welfare.[57] The SAFE 2 Rule in fact relied on a *distorted* balancing of costs and benefits to justify a costly rollback that would increase emissions. By putting forward revised vehicle standards that will reduce emissions and generate net social welfare, EPA has now properly balanced the factors that it must consider in a way once again consistent with principles for economic analysis and rational decisionmaking, and with its statutory responsibilities. EPA should therefore explicitly justify its current approach not as a reweighing of factors, but rather as correcting the SAFE 2 Rule's distorted approach, which had broken from best practices and decades of regulatory precedent.[58] Justifying the rule as following the proper approach, rather than just as a reweighing of factors, will give the rule a stronger, more durable foundation.

The Clean Air Act requires EPA to give "*appropriate* consideration to the cost of compliance."[59] But when EPA tried to balance the SAFE 2 Rule's costs and benefits in 2020, it found that the rollback's net effects at best "straddle[d] zero" or were "directionally uncertain," depending on the choice of discount rate; in fact, the analysis conducted at a 3% consumption-based discount rate showed that the rollback would result in billions of dollars in net costs.[60] EPA therefore explicitly admitted that it could not rely on its cost-benefit analysis to justify the rollback.[61] By instead increasing the "weight" ascribed to upfront costs in order to justify the rollback,[62] EPA correspondingly decreased the weight given to longer-term benefits, including fuel savings and environmental gains. But embellishing upfront costs by diminishing long-term cost savings and other effects was not an "appropriate" consideration of costs: it violated best economic practices and decades of regulatory precedent.

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[56] Consumers experience other benefits from improved fuel economy, including reduced refueling time and the benefits associated with additional driving. These comments sometimes focus on cost savings from reduced fuel consumptions, but the whole range of long-term consumer benefits should be valued. Indeed, these comments focus below on a market failure associated with reduced refueling time being, in part, an "experience good."

[57] 86 Fed. Reg. at 43,729.

[58] *See* Richard L. Revesz, Op-Ed, *Looking Under the Hood of Biden's New Clean Car Standards*, Bloomberg L., Aug. 18, 2021 (making the point that the proposed rule "restores integrity into the regulatory analysis by setting aside the indefensible approach at the root of the Trump administration's rule").

[59] 42 U.S.C. § 7521(a)(2) (emphasis added).

[60] 85 Fed. Reg. at 24,176, 25,099.

[61] *Id.* at 25,119–20 ("EPA has not chosen the standard that has the highest estimated net social benefits. . . . EPA believes consideration of costs and benefits is certainly relevant to its exercise of discretion . . . , but also recognizes . . . additional factors can provide material.").

[62] *Id.* at 25,120.

In economic terms, the weight assigned to upfront versus long-term effects is determined by the discount rate.[63] As the SAFE 2 Rule acknowledged, ascribing a high discount rate to consumers' valuations of future fuel savings can influence results such that fuel savings will appear not to outweigh the consumers' opportunity cost of purchasing a model with higher fuel economy.[64] Yet the SAFE 2 Rule offered no persuasive theory or evidence for why consumers would selectively apply a much higher discount rate to fuel savings, let alone why society should excessively discount fuel savings.[65]

In promulgating the SAFE 2 Rule, EPA and NHTSA speculated without adequate support that perhaps fuel economy upgrades entailed some unidentified technology tradeoffs that resulted in hidden opportunity costs for consumers, allegedly causing consumers to discount the value of future fuel savings.[66] But as Policy Integrity detailed in our 2020 report *Shortchanged: How the Trump Administration's Rollback of the Clean Car Standards Deprives Consumers of Fuel Savings*,[67] the agencies failed to marshal adequate theoretical or empirical support for such speculations.[68] Many fuel economy technologies increase performance,[69] and even if manufacturers may occasionally reduce select vehicle features like weight to achieve an inexpensive boost to fuel economy, such compliance choices would

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[63] *See, e.g.*, Council of Econ. Advisers, *Discounting for Public Policy* 1 (2017) (noting that, "[i]n benefit-cost analysis, discounting is used to compare benefits and costs of a project or regulation that occur in different time periods," to reflect preferences for consumption and investment over time).

[64] 85 Fed. Reg. at 24,604.

[65] In fact, EPA would be justified in focusing on its cost-benefit comparison in which all effects are discounted at a consumption-based discount rate of 3% or lower. A 7% capital-based discount rate theoretically assesses whether the net benefits from government action will exceed the returns that society could earn by instead investing the same resources in the private sector. But this framework for discounting and comparing benefits and costs makes sense only under the "extreme" assumption that all the costs of government action would "fully displace" (i.e., crowd out) private investment. *See* Interagency Working Group on the Social Cost of Greenhouse Gases, *Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide—Interim Estimates under Executive Order 13990* at 18-19 (2021). In this rulemaking, the upfront technology costs and long-term fuel savings will be felt primarily by individual consumers, as will rebound value and refueling time savings; other effects, like health effects, climate benefits, energy security, and congestion, will be felt by society as a whole. In other words, because of the nature of the rule, the theory for a capital-based discount rate has a tenuous application at best. EPA therefore would be justified in focusing on cost-benefit comparisons using consumption-based rates, with the application of a capital-based rate treated like a lower-bound sensitivity analysis. Moreover, 7% is almost certainly an overestimate for the capital-based rate, given updated data on lower long-term interest rates and the fact that—absent externalities and other distortions—the capital-based rate should decline in proportion. See Policy Integrity's separate comments on the social cost of greenhouse gases, submitted in this docket jointly with other organizations, for more on the appropriate selection of discount rates.

[66] *See, e.g.*, 85 Fed. Reg. at 24,610 (arguing that the market failures cited to explain the energy efficiency gap are "unpersuasive" because they do not "account for potential sacrifices in *other* vehicle attributes that manufacturers may make in order to achieve higher fuel economy without increasing vehicles' purchase prices beyond consumers' willingness to pay. Finally, claims that consumers are acting irrationally by refusing to purchase higher-mpg models usually reach this conclusion by comparing rates at which they implicitly discount future fuel costs . . . to interest rates in financial markets that incorporate time horizons or risk profiles that may be very different from those of consumers.").

[67] Bethany A. Davis Noll, Peter Howard, Jason Schwartz & Avi Zevin, *Shortchanged: How the Trump Administration's Rollback of the Clean Car Standards Deprives Consumers of Fuel Savings* (2020), https://policyintegrity.org/files/publications/Clean_Car_Standards_Rollback_and_Fuel_Savings_Report.pdf [hereinafter *Shortchanged*].

[68] *See id.* at 14 (detailing the limitations of the works on alleged vehicle attribute tradeoffs by Knittel, Klier & Linn, and MacKenzie & Heywood).

[69] *See id.* at 12-13 (recounting examples of improved performance); *id.* at 14 (critiquing the evidence of alleged tradeoffs); *id.* at 14-16 (recounting how technological advancements, learning, knowledge spillovers, and regulation-induced innovation have disrupted any historical tradeoffs).

significantly decrease regulatory costs in ways that the agencies did not account for in the SAFE 2 Rule.[70] Given that consumers can access financing at relatively low rates to purchase additional fuel-economy technologies that will pay for themselves, there is no justification to assume that—absent market failures—rational consumers would apply exceedingly high discount rates selectively just to future fuel savings.[71]

Though the SAFE 2 Rule's main cost-benefit analysis did fully value fuel savings,[72] the agencies' justification for the costly rollback departed from those findings. EPA wrongly claimed in 2020 that a full consideration of fuel savings "distorts the comparison," and the agency inappropriately focused on "upfront vehicle technology costs" by assuming that consumers may rationally choose "to buy a new vehicle at a lower up-front price even if that vehicle will incur a more-than offsetting level of fuel costs over its lifetime."[73] This approach to balancing the factors broke from decades of prior regulatory practice of acknowledging the existence of market failures and consistently considering the full energy savings of regulatory actions.[74] Ultimately, EPA got its conclusion entirely backwards in the SAFE 2 Rule: overly discounting the long-term benefits of vehicle standards is what "distorts" the analysis, by ignoring an important factor.

Case law supports that it was not appropriate for the SAFE 2 Rule to overly discount future cost savings in a way that disproportionately weighted upfront costs while effectively ignoring much of the longer-term effects. As the Supreme Court ruled in *Michigan v. EPA*, it is unreasonable to read a statutory reference to "appropriate" as "an invitation to ignore" a key effect; instead, "[c]onsideration of cost reflects the understanding that reasonable regulation ordinarily requires paying attention to the advantages *and* the disadvantages of agency decisions."[75] Courts similarly have faulted agencies for "put[ting] a thumb on the scale by undervaluing the benefits and overvaluing the costs of more stringent standards,"[76] and for "inconsistently and opportunistically fram[ing] the costs and benefits" of regulatory action.[77] By placing a thumb on the side of upfront costs and opportunistically ignoring long-term benefits, the SAFE 2 Rule fell far short of the statutory instructions to give "*appropriate* consideration to the cost of compliance" and balance that factor against public welfare.[78]

By applying appropriate discount rates to the consideration of costs and benefits and selecting a policy choice that will deliver net benefits and advance the Clean Air Act's purpose, EPA is now correcting the SAFE 2 Rule's departure from best economic practices and from an appropriate balancing of statutory factors. EPA should justify its approach not as a reweighting of factors, but rather as correcting the SAFE 2 Rule's distorted approach, which had broken from best practices and decades of regulatory precedent.

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[70] *Id.* at 11–16, 30–34 (explaining the constant performance assumption, the overperformance benefits that are not valued, and the potential cost savings if manufacturers did trade off fuel economy for other attributes). Similarly, if new vehicle standards did not prompt manufacturers to install fuel-efficiency technologies, and manufacturers instead developed other technological upgrades to other vehicle attributes, those other new attributes would still cost consumers money.

[71] *Id.* at 17–18.

[72] The agencies also ultimately admitted that market failures existed, even though they repeatedly cast doubt on them. *See* 85 Fed. Reg. at 24,613 ("[O]ur final modelling results reflect the case where some fuel efficiency gap persists.").

[73] *Id.* at 25,110–11.

[74] *Shortchanged*, *supra* note 67, at 21–29 (recounting 40 years of practice).

[75] 576 U.S. 743, 753 (2015).

[76] *Ctr. for Biological Diversity v. Nat'l Highway Traffic Safety Admin.*, 538 F.3d 1172, 1198 (9th Cir. 2008).

[77] *Bus. Roundtable v. Sec. & Exch. Comm'n*, 647 F.3d 1144, 1148–49 (D.C. Cir. 2011).

[78] 42 U.S.C. § 7521(a)(2) (emphasis added).

B. EPA Should Cite Additional Evidence and Theories of Market Failures and Should Affirmatively Conclude that Standards Help Correct Market Failures

The Proposed Rule and the supporting draft Regulatory Impact Analysis ("DRIA") discuss numerous explanations for why consumers are not able on their own to achieve optimal levels of fuel savings. However, EPA should more thoroughly identify the full range of market failures and more clearly conclude that regulations are necessary to help correct such market failures and so deliver net savings to consumers.

The Proposed Rule's preamble identifies several consumer behaviors that help explain the "energy efficiency gap," the phenomenon that describes how consumers do not always on their own purchase levels of energy efficiency that will save them money over time. Specifically, the Proposed Rule cites "myopic loss aversion," incomplete understanding of fuel savings, and not prioritizing fuel consumption in the complex process of selecting a vehicle.[79] In the Final Rule, EPA should connect these consumer behaviors to specific market failures, namely: myopia and loss aversion (which are two separate market failures); informational costs and asymmetries; and a variety of market failures that can affect prioritization, including salience, satisficing, positional externalities, and others.[80] Similarly, the Proposed Rule cites several producer-side explanations, including the large fixed costs of investments to switch to new technologies, and the complex and uncertain processes involved in technological innovation and adoption.[81] Again, the Final Rule should connect these with specific market failures, like first-mover disadvantages and network externalities.[82] As Executive Order 12,866 requires, agencies should identify the specific market failures or other problems that their rules address and assess the significance of the problems.[83]

The Proposed Rule's conclusion—that despite the lack of "consensus in the literature" on "which of these hypotheses for the efficiency gap explain its apparent existence," EPA "cannot reject the observation that the energy efficiency gap has existed for light-duty vehicles"[84]—is much more lukewarm than it needs to be. In fact, there is strong evidence that multiple market failures continue to plague consumers throughout the vehicle market.[85] The Final Rule should conclude that, given the broad range of potential market failures, stronger vehicle standards are clearly necessary to help consumers achieve net savings.

The DRIA offers some more details, by discussing additional market failures like positional externalities and first-mover effects.[86] However, the DRIA also offers the rather subdued conclusion that "it is not clear whether consumer behavior is responsible for the energy efficiency gap," and leaves it as "an open question why" the gap exists, though it concedes that "it appears to have happened."[87] Again, in either the Final Rule, the Final RIA, or both, EPA should make a much stronger conclusion. Even though it may

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[79] 86 Fed. Reg. at 43,787.

[80] *See* Rachel Rothschild & Jason A. Schwartz, *Tune Up: Fixing Market Failures to Cut Fuel Costs and Pollution from Cars and Trucks* 11–14 (Policy Integrity Report 2021), https://policyintegrity.org/files/publications/Tune_Up_Fixing_Market_Failures_to_Cut_Fuel_Costs.pdf [hereinafter *Tune Up*].

[81] 86 Fed. Reg. at 43,787.

[82] *Tune Up, supra* note 80, at 13.

[83] Exec. Order No. 12,866 § 1(b)(1), 58 Fed. Reg. at 51,735.

[84] 86 Fed. Reg. at 43,787–88.

[85] *See generally Tune Up, supra* note 80.

[86] DRIA, *supra* note 10, at 8-4, 8-6.

[87] *Id*. at 8-5, 8-6.

not be clear which market failure is the dominant cause of the energy efficiency gap, there is considerable evidence that at least some market failures are in part responsible for consumers purchasing less vehicle efficiency than would benefit them, and so there is a clear role for regulations to correct these market failures.

To support this stronger conclusion, EPA should add descriptions of both additional market failures that exist, as well as additional evidence for the market failures that are already mentioned. EPA should also make clearer that different market failures may apply to different categories of consumers, as the market failures that affect purchases by individual consumers may be the same or different from market failures that affect small business fleets, governmental and institutional fleets, or corporate fleets of light-duty vehicles.[88] The literature recognizes multiple additional market failures that EPA has not yet discussed in the Proposed Rule or DRIA. These additional failures include:

- **Dealership incentives, biases, and information asymmetries**. Consumers typically must purchase new vehicles from dealerships, and salespeople have significant influence on consumer purchasing decisions.[89] Yet salespeople's own incentives and biases may cause informational asymmetries that prevent consumers from purchasing optimal fuel efficiency.[90] Studies have found that dealers and salespeople often believe (whether or not it is true) that electric vehicles and other highly efficient cars have lower profits for dealers than gas-powered cars,[91] including less profits from dealership-provided service and maintenance opportunities on electric vehicles, lower "back-end" profits on trade-ins of electric vehicles, and commission structures that may not compensate salespeople for the perceived increased paperwork and transaction costs of selling electric vehicles.[92] Perhaps partly because of such incentives, consumers and "mystery shoppers" conducting research have often complained of poor dealership experiences when trying to purchase electric vehicles, citing salespeople's limited knowledge and dishonesty; misinformation about electric vehicle's costs, range, and other attributes; inconsistent enthusiasm among salespeople for electric vehicles; dealerships' lack of inventory for more efficient and electric vehicles; poor timeliness for completing paperwork and delivery of electric vehicles; limited promotional materials on energy efficiency; and dealerships' inability to facilitate consumers' cost comparisons of electric versus gas vehicles.[93] Some

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[88] *See Tune Up*, *supra* note 80, at 3–4, 11.

[89] Cox Automotive, *Evolution of Mobility: The Path to Electric Vehicle Adoption* 29 (2019), https://perma.cc/UV7N-42BE (documenting that 74% of consumers report that a dealer has a strong influence on their purchases).

[90] *See* Fred Lambert, *After Losing Dealers over Its Electric Move, Cadillac Is Now Gaining New Ones*, ELECTREK, Sept. 23, 2021 (reporting that one-fifth of U.S. Cadillac dealers exited from the brand in 2020 rather than commit to selling electric vehicles).

[91] Cox Automotive, *supra* note 89, at 23 (reporting that 54% of surveyed dealers say there is a lower ROI for sales of EVs compared to gas); Eric Cahill et al., *New Car Dealers and Retail Innovation in California's Plug-In Electric Vehicle Market* (U.C. Davis Inst. Of Transp. Stud., Working Paper UCD-ITS-WP-14-04, 2014), https://perma.cc/DJ7T-SGXT (citing real or perceived profitability concerns, especially for compact or midsized vehicles).

[92] Cahill et al., *supra* note 91, at 10 ("[A]s a category, PEVs may not represent a compelling investment to many dealers."); *id.* at 9–10 (noting that dealers have the false perception that PEVs entail longer transaction times and lower profits, when in fact dealers make more than average on PEVs in gross profits).

[93] *Id.*; Draft TAR, *supra* note 43, at 6-15 (citing conclusions from the NAS committee); Cox Automotive, *supra* note 89; Gerardo Zarazua de Rubens et al., *Dismissive and Deceptive Car Dealerships Create Barriers to Electric Vehicle Adoption at the Point of Sale*, 3 NATURE ENERGY 501 (2018); Lindsay Matthews et al., *Do We Have a Car for You? Encouraging the Uptake of Electric Vehicles at Point of Sale*, 100 ENERGY POL'Y 79 (2017); Eric Evarts, *Dealers Not Always Plugged in About Electric Cars, Consumer Reports' Study Reveals*, CONSUMER REPORTS, Apr. 22, 2014, https://perma.cc/VYU9-QUW7; Zoe Long et al., *Consumers Continue to Be Confused About Electric Vehicles: Comparing Awareness Among Canadian New Car Buyers in 2013 and 2017*, 14 ENV'T RES.

dealerships have admitted that poor sales training is a major barrier to electric vehicle sales.[94] Because consumers rely on dealerships, but dealerships have different incentives and information than consumers, market failures can occur.

- **Split incentives**. When the purchaser of a vehicle does not have to pay the costs of fuel usage, this can create a market failure known as "split incentives" or the "principal-agent problem."[95] Economists have found, for example, that split incentives can lead to undervaluation of fuel economy in the shipping industry, as parties that own or operate trucks are frequently not responsible for fuel costs.[96] A similar dynamic can occur in other contexts, such as in the large rental vehicle fleets of light-duty vehicles, since rental companies do not pay for fuel costs. Government intervention can ensure that purchasers make societally optimal investments in energy efficiency technologies when they receive inadequate market incentives because of principal-agent problems.[97]
- **Network externalities**. Though EPA mentions some network effects, there is additional evidence of market failures in this area. The benefits of a new technology sometimes depend on widespread adoption by others, creating a situation where "proven" technologies are chosen even though others would save more money in the long run.[98] Network externalities can affect investments in electric vehicle charging, maintenance facilities, natural-gas refueling, and replacement parts.[99] In turn, these externalities can affect a range of consumers and vehicles, from individuals to businesses, and from passenger cars to heavy-duty trucks. Because consumers buying alternative fuel or more efficient vehicles must make predictions about the future development of these critical networks in order to estimate their long-term savings, various market failures from information asymmetries and costs, myopia, and loss aversion all come into play here. Transaction costs and principal-agent dynamics may also prevent some vehicle consumers from getting access to the charging facilities at their apartment buildings or office buildings that they would require before purchasing electric vehicles, even as those

LETTERS 114036 (2019); *see also* Jennifer Lynes, *Dealership Are a Tipping Point*, 3 NATURE ENERGY 457 (2018) (op-ed suggesting that the results from Zarazua de Rubens et al. are broadly applicable).

[94] Cox Automotive, *supra* note 89, at 30 (blaming lack of OEM support).

[95] *See* David Vernon & Alan Meier, *Identification and Quantification of Principal-Agent Problems Affecting Energy Efficiency Investments and Use Decisions in the Trucking Industry*, 49 ENERGY POL'Y 266, 267 (2012) ("There are numerous market failures and barriers to investment in energy efficiency in the trucking industry. Split incentives described by principal-agent problems are an important class of existing market failures that obscure price signals.").

[96] *See id.* at 270–71 (finding that "[t]he separation of fuel cost payment and driver behavior . . . appears to be widespread" and that "[u]p to 91% of trucking fuel consumption is exposed to this usage [principal-agent] problem").

[97] *See generally* Kenneth Gillingham & Karen Palmer, *Bridging the Energy Efficiency Gap: Policy Insights from Economic Theory and Empirical Evidence*, 8 REV. ENV'T ECON. & POL'Y 18–38 (2014) (explaining how principal-agent problems and other market failures can explain the energy efficiency gap and provide a basis for regulatory intervention).

[98] Todd D. Gerarden, Richard G. Newell & Robert N. Stavins, *Assessing the Energy-Efficiency Gap* 24 (NBER Working Paper No. 20904, 2015), https://www.nber.org/system/files/working_papers/w20904/w20904.pdf.

[99] *See id.*; *see also* Shanjun Li et al., *The Market for Electric Vehicles: Indirect Network Effects and Policy Design*, 4 J. ASS'N ENV'T RES. ECON. 89 (2017) (analyzing how "EVs [electric vehicles] face several significant barriers to wider adoption, including the high purchase cost, limited driving range, the lack of charging infrastructure, and long charging time"); EPA & Nat'l Highway Traffic Safety Admin., *Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles - Phase 2, Regulatory Impact Analysis* 8-7 to 8-8 (2016), https://nepis.epa.gov/Exe/ZyPDF.cgi/P100P7NS.PDF?Dockey=P100P7NS.PDF [hereinafter "2016 Heavy-Duty FRIA"] (noting network externalities for natural gas fueling, repair facilities, and replacement parts).

buildings' owners may be uncertain about their tenants' demand for such charging facilities.[100] Fuel economy and vehicle emission standards help resolve the coordination, first-mover, and informational problems facing the developers of this network infrastructure, thereby providing greater certainty that consumers can achieve long-term cost savings.[101]

- **Salience, inattention, and mental accounting**. Evidence continues to show that even though consumers have access to fuel economy labels, they may not accurately or fully factor those values into their decisions. The fuel economy differences among similar vehicles tend to be small on a miles-per-gallon (MPG) basis, and so may not be particularly salient.[102] Salience bias may therefore cause consumers to inefficiently undervalue fuel economy in their vehicle purchasing decisions. Consumers also continue to misunderstand that fuel costs are inversely related to fuel economy (what is known as the "MPG illusion").[103] Consumers may value such information only in relative rather than absolute terms,[104] and so may undervalue potential fuel costs savings. Left-digit bias may also affect consumer interpretation of relative MPG values, as it does when consumers focus on only the left-most digit in prices (e.g., the 99-cent price effect) or in the odometer values on used cars.[105]

- **Additional myopia and inattention, including short-termism**. Though EPA refers to myopia, the evidence for such market failures is more extensive than EPA recounts.[106] Though myopia and inattention may more commonly plague individual consumers, economists have also found that managers at certain companies can exhibit similar kinds of inattention and so fail to implement many energy efficiency initiatives despite positive paybacks.[107] Businesses may also face a kind of myopia called short-termism, in which certain corporate employees have an incentive to favor short-term profits over long-term investments if, for example, their personal compensation or career prospects are tied to near-term earnings.[108] Employees with such incentives may have reason to purchase cheaper, less efficient vehicles.[109] To the extent short-termism is exacerbated by an informational asymmetry either between employees (who know

[100] *See, e.g.*, Luskin Ctr. for Innovation, *Evaluating Multi-Unit Resident Charging Behavior at Direct Current Fast Chargers* (2021), https://perma.cc/7VBW-JZBW.

[101] Resolving the coordination and informational problems facing the developers of network infrastructure may also be an independent justification for government regulation of fuel economy, beyond its contribution to the energy efficiency gap.

[102] Nat'l Acad. of Scis. (NAS), *Assessment of Technologies for Improving Light-Duty Vehicle Fuel Economy—2025–2035* at 11-354 (2021).

[103] *Id.* at 11-352 to -353.

[104] *Id.* at 11-352.

[105] Nicola Lacetera et al., *Heuristic Thinking and Limited Attention in the Car Market* (Nat'l Bureau of Econ. Rsch., Working Paper No. 20904 17030, 2011).

[106] *See Tune Up*, *supra* note 80, at 12 (summarizing and citing Gloria Helfand & Reid Dorsey-Palmateer, *The Energy Efficiency Gap in EPA's Benefit-Cost Analysis of Vehicle Greenhouse Gas Regulations: A Case Study*, 6 J. BENEFIT COST ANALYSIS 432, 439 (2015); Kenneth Gillingham, Sébastien Houde & Arthur van Benthem, *Consumer Myopia in Vehicle Purchases: Evidence from a Natural Experiment* (Nat'l Bureau of Econ. Rsch., Working Paper No. 25845, 2019); D. Duncan et al., *Most Consumers Don't Buy Hybrids: Is Rational Choice a Sufficient Explanation?*, 10 J. BENEFIT-COST ANALYSIS 1 (2019)).

[107] *See* Suresh Muthulingam et al., *Energy Efficiency in Small and Medium-Sized Manufacturing* Firms, 15 MFG. & SERV. OPERATIONS MGMT. 596, 612 (2013) (finding that manager inattention contributed to the non-adoption of energy efficiency initiatives, since initiatives that appear lower on a list of efficiency recommendations, and initiatives that require more managerial attention, are less likely to be adopted).

[108] A similar dynamic could exist in government, and so affect local, state, and federal government fleet purchases, if officials are rewarded for short-term cost savings rather than long-term fiscal health.

[109] This incentive could be muted by a firm's accounting practices if costs and expenses are amortized over time.

that lower vehicle purchase prices will favorably boost short-term earnings reports) and investors (who may not know that more efficient vehicle purchases could have increased their long-run returns), or is caused by myopia, the phenomenon is a market failure.[110] Economic studies suggest that short-termism can affect managers' choices about energy efficiency specifically,[111] and about environmental sustainability more broadly.[112]

- **Manufacturer market power**. Though EPA mentions how strategic marketing choices by manufacturers can result in inefficient under-supply of fuel economy to some consumer segments (and inefficient over-supply in other market sectors),[113] EPA does not fully connect this inefficient pattern to market power. Because of the limited competition in at least some segments of the vehicles market, manufacturers may be able to act strategically when pricing vehicles and when producing vehicles with combinations of different fuel economy and other vehicle features in order to push consumers towards purchases that lead to higher manufacturer profits at the expense of optimal fuel economy.[114] There is a relatively small number of firms producing several types of vehicles and engines across the light-duty and heavy-duty markets.[115] This market failure therefore could influence purchases by all consumer groups and across several vehicle classifications.
- **Additional first-mover effects**. EPA mentions the first-mover disadvantages that may cause manufacturers to under-invest in research into new fuel-efficiency technologies in the face of uncertainty, but there is additional evidence for this market failure. Economists have noted that the first-mover disadvantage can be especially pronounced when returns to society are greater than those to the investor, as is the case with fuel-efficiency technologies that reduce oil use and greenhouse gas emissions.[116] Short-termism can also compound the first-mover disadvantage, as manufacturers have to balance the immediate costs and risks of research

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[110] *See* Sheila Bair, *Short-Termism and the Risk of Another Financial Crisis*, WASH. POST (July 8, 2011) (op-ed by the former Chair of the FDIC calling short-termism a "market failure"); Marc Jarsulic et al., Ctr. for Am. Progress, *Long-Termism or Lemons: The Role of Public Policy in Promoting Long-Term Investments* 11–12 (2015), https://perma.cc/SYL4-XPUK (including a section called "short-termism as a market failure" attributed to "asymmetric information between managers and investors" and "behav[ing] myopically"); Lynne L. Dallas, *Short-Termism, the Financial Crisis, and Corporate Governance*, 37 J. CORP. L. 265, 310–16 (2012) (reviewing various explanations for short-termisms, including asymmetric information and myopia).

[111] *See* Stephen J. DeCanio, *Barriers Within Firms to Energy-Efficient Investments*, 21 ENERGY POL'Y 906, 907–08 (1993) (explaining how tying management compensation to short-term performance can lead to underinvestment in energy efficiency, and also how stock markets and investors may not be able to detect inefficient management decisions); Suresh Muthulingam et al., *Adoption of Profitable Energy Efficiency Related Process Improvements in Small and Medium Sized Enterprises* 1, 7 (Working Paper, 2008) (finding that managers fail to implement energy efficiency improvements with short payback periods for several reasons, including myopia and a stronger focus on upfront costs than on net benefits, attributed partially to short-termism).

[112] *See* Yujing Gong & Kung-Cheng Ho, *Corporate Social Responsibility and Managerial Short-Termism*, ASIA-PACIFIC J. ACCT & ECON. (2018).

[113] DRIA, *supra* note 10, at 8-5.

[114] *See generally* Carolyn Fischer, Res. for the Future, *Imperfect Competition, Consumer Behavior, and the Provision of Fuel Efficiency in Light-Duty Vehicles* (2010), https://www.rff.org/documents/1472/RFF-DP-10-60.pdf.

[115] *See id.* at 3 (explaining that "the largest four firms accounted for 75.5 percent of the value of shipments in the automobile market and 95.7 percent of the light-duty and utility vehicle market"); NAS, *supra* note 102, at 11-356 (citing that the top ten firms accounted for 90% of light-duty sales in 2018); *see also* Winston Harrington & Alan Krupnick, Res. for the Future, *Improving Fuel Economy in Heavy-Duty Vehicles* (2012), https://media.rff.org/documents/RFF-DP-12-02.pdf (explaining that the heavy-duty trucking industry "is dominated by a small number of large manufacturers" and is even smaller than it would seem at first glance because of "affiliations, partnerships, and outright ownership of one company by another").

[116] Nat'l Rsch. Council (NRC), *Cost, Effectiveness, and Deployment of Fuel Economy Technologies for Light-Duty Vehicles* 319 (2015), http://nap.edu/21744.

against the longer-term profits from future sales. Since each manufacturer faces muted incentives to be the first to research and deploy new technologies, without regulations, no manufacturer is likely to produce vehicles with the socially optimal level of energy efficiency.[117] Because manufacturers are responding to consumer demand for fuel economy that multiple other market failures have already depressed, this first-mover dynamic can exacerbate the energy efficiency gap.[118] First-mover effects can also affect vehicle consumers, including corporate and institutional purchasers.[119] Without regulatory incentives, firms may underinvest in purchasing such efficiency-enhancing technology as they all wait for their competitors to go first and bear the costs of testing the implementation of new technology.

- **Additional information costs and asymmetries, including experience goods.** Though EPA refers to some informational costs, the evidence for market failures is more extensive than EPA recounts.[120] Consumers may also lack information to fully value some benefits of more efficient vehicles—like the benefit of not having to stop as often (or at all) to refuel—until after the consumer has already purchased and experienced the good.[121] Because insufficient information can mute consumer demand for fuel economy, this can also lead manufacturers to underinvest in fuel economy and in lowering greenhouse gas emissions.

EPA should cite these additional market failures and evidence, and EPA should offer a clearer conclusion that there is considerable evidence that at least some market failures are responsible for consumers purchasing less vehicle efficiency than would benefit them, and so there is a clear role for regulations to correct these market failures.

C. EPA Should Clearly State that Its Model's Constant Performance Assumption Obviates the Need to Estimate Lost Consumer Welfare (Which Is Likely Small)

The Proposed Rule appropriately concludes that the SAFE 2 Rule was inaccurate in finding that vehicle standards would substantially change vehicle attributes and consumer choices,[122] and the Proposed Rule further notes persuasive evidence that manufacturers can implement fuel-efficiency technologies

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[117] *See* 2016 Heavy-Duty FRIA, *supra* note 99, at 8-8 ("Manufacturers may be hesitant to offer technologies for which there is not strong demand, especially if the technologies require significant research and development expenses and other costs of brining the technology to a market of uncertain demand.").

[118] Because it creates externalities and coordination issues that raise the cost of developing beneficial technologies, the first-mover disadvantage facing manufacturers may also be an independent justification for government regulation of fuel economy, beyond its contribution to the energy efficiency gap.

[119] For example, some focus-group studies of medium- and heavy-duty truck purchasers have found that they may hesitate to purchase more fuel-efficient vehicles because they are unsure about their reliability. *See* Heather Klemick, Elizabeth Kopits, Keith Sargent & Ann Wolverton, Nat'l Ctr. for Env't Econ., *Heavy-Duty Trucking and the Energy Efficiency Paradox*, 12, 20 (2014), https://www.epa.gov/sites/default/files/2014-12/documents/heavy-duty_trucking_and_the_energy_efficiency_paradox.pdf.

[120] *See Tune Up*, *supra* note 80 (summarizing and citing David L. Greene, *Implications of Behavioral Economics for the Costs and Benefits of Fuel Economy Standards*, 6 Current Sustainable/Renewable Energy Rep. 177, 182 (2019); James Sallee, *Rational Inattention and Energy Efficiency*, 57 J. L. & Econ. 781, 782–85 (2014)).

[121] These kinds of "experience goods" can create market failures. *See* Cass R. Sunstein, *Rear Visibility and Some Unresolved Problems for Economic Analysis (with Notes on Experience Goods)*, 10 J. Benefit-Cost Analysis 317, 342–46 (2019). Experience goods have been associated with plug-in hybrids. *See* Margaret Taylor & K. Sydny Fugita, Lawrence Berkeley Nat'l Lab'y, *Consumer Behavior and the Plug-In Electric Vehicle Purchase Decision Process: A Research Synthesis* 9, 49 (2018).

[122] 86 Fed. Reg. at 43,782 ("EPA currently does not believe this is an accurate assessment or one that deserves weight.").

without imposing hidden costs.[123] Indeed, not only has the marginal rate of substitution between power and fuel economy changed over time, such that newer technology improvements do not reduce power,[124] but many fuel-efficiency technologies enhance power, performance, handling, or other attributes.[125] The DRIA expands on this evidence and also notes that EPA's analytical model assumes that manufacturers will incur any additional costs necessary to hold performance constant, and yet EPA does not estimate either the cost savings that would follow if manufacturers instead chose to trade off some performance attributes for lower emissions to some extent, nor does EPA estimate the benefits from installing fuel-efficient technologies while maintaining or increasing performance attributes.[126] EPA should therefore even more strongly conclude that the constant performance assumption built into the current model obviates the need to estimate any potential lost consumer welfare from forgone attributes. Moreover, not only is any such lost welfare likely small,[127] but it would also be offset by countervailing effects: vehicles with slightly less horsepower, for example, would have lower risks of accidents and reduced negative positional externalities,[128] and some fuel-efficient technologies indirectly but automatically improve other performance attributes in ways that would benefit consumers.[129]

IV. EPA Has Begun to Make Appropriate Changes to Its Modeling Approach; Further Adjustments in the Future Would More Fully Capture the Benefits of Strong Standards

In this rulemaking, EPA has chosen to rely on the same CCEMS model used by EPA and NHTSA to develop the SAFE 2 standards. Policy Integrity previously provided comments on the SAFE proposal and issued public reports on the final SAFE 2 Rule analyzing technical and economic flaws that cause this model to overestimate the costs and undervalue the benefits of strong standards.[130] While EPA has begun to make appropriate adjustments to address some of these flaws, Policy Integrity recommends EPA make further changes to its model for the final rule, to work closely with NHTSA to maintain consistency in analysis with the companion fuel economy standards where appropriate, and to continue to develop its new OMEGA2 model for future rulemakings. In general, the below suggestions would not change the direction of EPA's cost-benefit analysis (i.e., the proposal and alternatives would continue to

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[123] *Id.* at 43,787 (citing Gloria Helfand et al., *Searching for Hidden Costs: A Technology-Based Approach to the Energy Efficiency Gap in Light-Duty Vehicles*, 98 ENERGY POL'Y 590 (2016); Hsing-Hsiang Huang et al., *Re-Searching for Hidden Costs: Evidence from the Adoption of Fuel-Saving Technologies in Light-Duty Vehicles*, 65 TRANSP. RSCH. PART D 194 (2018)).

[124] *Id.* (citing Watten et al. 2021 and Andrew Moskalik et al., *Representing GHG Reduction Technologies in the Future Fleet with Full Vehicle Simulation* (SAE Int'l, Working Paper No. 2018-01-1273, 2018)).

[125] *See id.* at 43,730, 43,751; *see also Shortchanged, supra* note 67, at 12-13 (recounting examples of improved performance); *id.* at 14 (critiquing the evidence of alleged tradeoffs); *id.* at 14-16 (recounting how technological advancements, learning, knowledge spillovers, and regulation-induced innovation have disrupted any historical tradeoffs).

[126] DRIA, *supra* note 10, at 8-3.

[127] *Shortchanged*, *supra* note 67, at 12–14, 30–34 (explaining the flaws with the SAFE 2 Rule's calculation of lost welfare, critiquing the evidence for lost welfare, and explaining how positional externalities mean that forgone vehicle features do not necessarily result in lost consumer welfare).

[128] *Id.* at 33–34.

[129] *Id.* at 32–33.

[130] *See generally* Inst. for Pol'y Integrity, Comments on The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks (Oct. 26, 2018), https://policyintegrity.org/documents/Emissions_Standards_EPA_NHTSA_Comments_Oct2018.pdf [hereinafter "Policy Integrity SAFE Comments"]; *Report Series: the Flawed Analysis Underlying the Rollback of the Clean Car Standards*, Inst. for Pol'y Integrity (Dec. 3, 2020), https://policyintegrity.org/projects/update/report-series-the-flawed-analysis-underlying-the-rollback-of-the-clean-car-standards.

have net benefits), but rather could significantly increase the magnitude of estimated net benefits of these and future standards by more properly estimating the effects of stronger standards.

Policy Integrity provides the following comments to support EPA's proposed changes in input choices for the CCEMS model, as well as to encourage EPA to consider further changes for the final rule and in future rulemakings.[131]

A. EPA's Return to Its Prior Estimate of Rebound Effect Is Appropriate

While EPA and NHTSA previous relied on a 10% rebound estimate in the Clean Car Standards issued in 2012, the agencies used a 20% rebound estimate in the final SAFE 2 Rule in 2020.[132] The agencies' departure from prior practice in the SAFE rulemaking was arbitrary and capricious, and EPA's return to 10% in the proposal here is more consistent with the best available evidence.

To arrive at the new estimate in the SAFE 2 Rule, the agencies in 2020 made significant changes to their assumptions about the magnitude of the rebound effect. These changes resulted in a significant increase in the costs and fatalities that the agencies attributed to the baseline standards.[133] Those fatalities and costs helped serve as the agencies' justification for the misguided 2020 rollback of those standards.[134] But the agencies' methodological changes in the 2018 SAFE proposal and 2020 final SAFE 2 Rule were inconsistent with the best available evidence regarding rebound.

Policy Integrity provided comments during the SAFE rulemaking demonstrating that EPA and NHTSA's selection of a 20% value for rebound effect was arbitrary and capricious.[135] By restoring the value of rebound effect to 10%, consistent with the agency's practice prior to the SAFE rulemaking, EPA has improved the accuracy of the CCEMS model for this rulemaking by using a value supported by an appropriate meta-analysis of the academic literature.[136]

As Policy Integrity noted in comments on the SAFE proposal, EPA and NHTSA failed to adequately explain their departure from a 10% rebound effect. The agencies ignored studies that supported a lower rebound value, including studies relied upon by the agencies in the past and new studies published since the prior rulemaking.[137] Overall, the agencies failed to present sufficient evidence in 2020 to support abandoning its prior use of a 10% rebound effect.[138]

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[131] *See* 86 Fed. Reg. at 43,769 (requesting comment on proposed input changes, and whether there are other input choices EPA should consider).

[132] *Compare* 77 Fed. Reg. at 62,716, 62,924 (10%), *with* 85 Fed. Reg. at 24,676 (20%).

[133] Nat'l Highway Traffic Safety Admin. & Env't Prot. Agency, *Final Regulatory Impact Analysis: The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Year 2021–2026 Passenger Cars and Light Trucks* tbls.VII-482, -484 (2020), https://www.nhtsa.gov/sites/nhtsa.gov/files/documents/final_safe_fria_web_version_200701.pdf [hereinafter "SAFE 2 Final RIA"] (showing higher net benefits of roll back under agencies' new rebound assumptions ("Reference Case") than under previous rebound assumptions ("Rebound Effect at 10%")); *id.* at tbls.VII-478, -479 (same for fatalities).

[134] 85 Fed. Reg. at 25,038 (explaining that EPA and NHTSA considered increased emissions that resulted from additional driving due to the rebound effect); *id.* at 24,906 (explaining that EPA and NHTSA considered increased fatalities that resulted from additional driving due to the rebound effect).

[135] Policy Integrity SAFE Comments, *supra* note 130, at 98–124.

[136] *See id.* at 122-23 (reporting that a meta-analysis of economic literature based on closely matched studies arrives at consensus rebound effect of 10%).

[137] *Id.* at 101–05 & tbl.3.

[138] *Id.* at 105–09.

In contrast, EPA has now conducted an updated and rigorous literature review that more fully presents the large body of academic literature on the rebound effect.[139] This literature review includes studies that were previously considered by the agencies but ignored in the SAFE rulemaking, including Greene (2012),[140] Wang and Chen (2014),[141] and Gillingham (2016);[142] studies that Policy Integrity recommended the agencies consider in the SAFE rulemaking, including Gillingham (2015)[143] and Wenzel and Fujita (2018);[144] and studies published after the SAFE rule was finalized, including Knittel and Sandler (2018),[145] Gillingham and Munk-Nielsen (2019),[146] and Gillingham (2020).[147]

Most importantly, EPA has now evaluated the available economic literature to determine which studies were most relevant to the proposed standards, weighting the analysis based on geographic/timespan relevance, time period of study, reliability/replicability, and strong statistical/methodological basis.[148] In the SAFE rulemaking, the agencies calculated a simple average from the arbitrarily incomplete set of studies they considered—a flawed methodology, inconsistent with EPA's own guidelines for reaching conclusions using multiple studies, that led to an improperly inflated rebound effect.[149] As Policy Integrity noted in previous comments, a meta-analysis focusing on closely matched studies—as EPA has done in the Proposed Rule—is a much more rigorous approach to evaluate results based on multiple studies.[150]

In addition, EPA has now offered several specific reasons why the agencies' prior rebound estimate of 20% are likely overstated. First, consumers' total VMT (vehicle miles traveled) may be more responsive to sharp increases in fuel prices as compared to the gradual decrease in fuel costs-per-mile that will result from these proposed standards, and therefore any rebound effect resulting from the standards may be smaller than some historical estimates of rebound based on price fluctuations.[151] Second, consumers are likely to respond less to small changes in their costs per mile traveled as they become wealthier, and total U.S. GDP is projected to increase over time based on the latest projections.[152] Together, these two considerations further suggest that an estimate of 10% or lower is appropriate, whereas the 20% estimate was much too high. And while EPA could not quantify the possible indirect and economy-wide rebound effects due to limited data,[153] such effects are likely small and, to the extent they exist, they may be offset by the two consumer response factors discussed above.

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[139] DRIA, *supra* note 10, at 3-2 to 3-11.

[140] DRIA, *supra* note 10, at 3-5; Policy Integrity SAFE Comments, *supra* note 130, at tbl.3.

[141] DRIA, *supra* note 10, at 3-7; Policy Integrity SAFE Comments, *supra* note 130, at tbl.3.

[142] DRIA, *supra* note 10, at 3-9; Policy Integrity SAFE Comments, *supra* note 130, at tbl.3.

[143] DRIA, *supra* note 10, at 3-8; Policy Integrity SAFE Comments, *supra* note 130, at 104–05.

[144] DRIA, *supra* note 10, at 3-9 to 3-10; Policy Integrity SAFE Comments, *supra* note 130, at 104–05.

[145] DRIA, *supra* note 10, at 3-9.

[146] *Id.* at 3-10.

[147] *Id.*

[148] *Id.* at 3-12.

[149] *See* Policy Integrity SAFE Comments, *supra* note 130, at 110.

[150] *See id.* at 119, 122–23.

[151] DRIA, *supra* note 10, at 3-4.

[152] *Id.* at 3-15.

[153] *Id.* at 3-1 to 3-2.

B. EPA Should Use Long-Run (Not Just Short-Run) Estimates for Sales Elasticity in the Final Rule

As in the final SAFE 2 Rule, EPA has used a value of -1 to estimate the elasticity of demand.[154] EPA admits that this estimate is "based on literature more than 25 years old" and therefore the agency is reviewing more recent estimates and has run a sensitivity analysis at -0.4.[155] Based on the best available evidence, EPA should in fact focus its main analysis on a lower demand elasticity based on long-run estimates.

Price elasticity measures the sensitivity of the sales of a particular product to fluctuations in that product's price. While sales will typically increase when prices drop and decrease when prices rise, the strength of that relationship will depend on buyers' need for the product and the availability of substitutes. Sales of necessity products with few comparable substitutes are likely more insensitive to price fluctuations. In economic terms, such products are *inelastic*. By contrast, products that are less essential or that can be easily substituted by other products are typically *elastic*, meaning that their sales are more sensitive to price fluctuations.[156]

Automobiles currently fall into the former category. Because automobiles are typically considered to be essential goods in most areas of the United States today, due to the current lack of adequate comparable substitutes, both economic theory and observed behavior finds that vehicle sales are relatively inelastic—meaning that price fluctuations produce just modest changes in vehicle sales.[157] Indeed, EPA and NHTSA's model even assumes that all consumers will remain in the automotive market, with used vehicles being the only reasonable substitute for new vehicles.[158] Though this is an appropriately simplifying assumption for now, going forward the agencies should work toward a more realistic sales model if public transportation, ride sharing, and other alternatives become more available, and EPA should consider modeling changes in elasticity over time.

As shown in Table 1 (see appendix), the economic literature generally finds a relatively higher elasticity for short-run estimates of vehicle sales (effects within one year)[159] but much lower elasticity for longer-run estimates (especially for effects beginning five to ten years in the future).[160] This reflects that vehicle sales are more elastic in the very short term because a consumer may delay a car purchase for a year or so when faced with higher prices, but most consumers facing modest prices changes are not willing to delay their car purchase more than that, given the general necessity of vehicle ownership and relative inability of current alternative modes of transportation to provide a complete substitute. Given that tailpipe emissions standards apply several model years in the future, and that the analytical model used

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154 86 Fed. Reg. at 43,788.

155 *Id*.

156 ROBERT S. PINDYCK & DANIEL L. RUBINFELD, MICROECONOMICS 26–30 (1989) (providing background on price elasticity and using the example of butter and margarine to explain that products with close substitutes are more elastic).

157 Saul H. Hymans, *Consumer Durable Spending: Explanation and Prediction*, (Brookings Papers on Econ. Activity 1970), https://www.brookings.edu/wp-content/uploads/1970/06/1970b_bpea_hymans_ackley_juster.pdf ("The automobile has apparently become so necessary in the American economy that its price elasticity is beginning to resemble that of food."). The agencies relied on this paper when setting the baseline standards. *See* 77 Fed. Reg. at 63,102 n.1300.

158 SAFE 2 Final RIA, *supra* note 133, at 895–900.

159 *See* PINDYCK & RUBINFELD, *supra* note 156, at 30 (describing short-run elasticity as measuring "one year or less").

160 See Thomas H. Klier & Joshua Linn, *The Effect of Vehicle Fuel Economy Standards on Technology Adoption*, 133 J. PUB. ECON. 41, 44 (2016).

by EPA and NHTSA projects sales impacts 30 years in the future, EPA has previously indicated that short-run estimates of elasticity are not appropriate.[161]

In the regulatory proposal underlying the SAFE 2 Rule, EPA and NHTSA projected that the price elasticity for new car and light truck sales "ranged from -0.2 to -0.3"—meaning, in other words, that a 1 percent increase in sticker price would decrease sales by only 0.2–0.3 percent.[162] Yet in the final Safe 2 Rule, the agencies abruptly rejected their earlier elasticity estimate and drastically increased the price elasticity more than three-fold. The agencies claimed that the price elasticity for new vehicles was -1—meaning that new car sales would decline by 1 percent for every 1 percent increase in sticker price.[163] But the agencies offered minimal justification for this substantial revision. And by making this change in the final rule, the agencies did not provide an opportunity for comment.[164]

Policy Integrity provides these comments now to urge EPA not to rely on the overly conservative estimate of demand elasticity from the SAFE 2 Rule. The agency should instead conduct a full review of the relevant economic literature, which confirms that vehicles are currently an inelastic good in the long run—with a price elasticity far below -1 in absolute terms.

After EPA and NHTSA abruptly changed the demand elasticity in the final SAFE 2 Rule, Policy Integrity issued a report reviewing the relevant literature.[165] As further explained in this report, the SAFE 2 Rule erroneously relied on short-run estimates of demand elasticity even though long-run estimates are more appropriate for standards that apply several years into the future,[166] and even though the agencies used long-run estimates of other inputs elsewhere in their rule analysis.[167] Table 1 (see appendix) demonstrates that EPA's continued use of -1 is overly conservative compared to the most current literature.

The estimate chosen for sales elasticity has a significant impact on EPA's analysis, as it directly influences the dynamic fleet share model's projection of sales and scrappage impacts and fleet size, thus affecting key projections such as criteria pollutant and greenhouse gas emissions.[168] By continuing to use the conservative demand elasticity from the SAFE 2 Rule, EPA may be undervaluing the net benefits of its new proposed standards by as much as $10 billion.[169]

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161 Draft TAR, *supra* note 43, at A-40.

162 83 Fed. Reg. at 43,075.

163 85 Fed. Reg. at 24,617.

164 *See* Ctr. for Biological Diversity et al., Petition for Reconsideration of EPA's Final Rule—The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks 42–43 (June 29, 2020) (Docket No. EPA-HQ-OAR-2018-0283).

165 Peter Howard & Max Sarinsky, *Turbocharged: How One Revision in the SAFE Rule Economic Analysis Obscures Billions of Dollars in Social Harms* (Policy Integrity Report, 2020), https://policyintegrity.org/publications/detail/turbocharged [hereinafter *Turbocharged*].

166 *Id.* at 5–7.

167 SAFE 2 Final RIA, *supra* note 133, at 968 n.1900 ("Most of the vehicles affected by today's standards will remain on the roads for at least a decade, with a significant fraction surviving considerably longer. As such, long-run estimates are more likely to reflect the lifetime mileage accumulation of the new fleet than either short-run or medium-run estimates. Furthermore, a long-run rebound estimate better reflects the cumulative impact of successive CAFE and CO_2 standards such as those adopted by the agencies beginning as early as 2010."); *see also* DRIA, *supra* note 10, at 3-1 (explaining rationale for using long-run estimates for VMT rebound).

168 *Turbocharged*, *supra* note 165, at 4; *see also* SAFE 2 Final RIA, *supra* note 133, at 883–87.

169 *See* DRIA, *supra* note 10, at 10-18 (showing sensitivity case for demand elasticity of -0.4 results in net benefits of $150 billion at a 3% discount rate, compared to $140 billion for the proposal using -1 elasticity).

In its main analysis of its final rule, EPA should base its analysis on the best available estimates of long-run sales elasticity. An estimate around -0.4 would be appropriate for a long-run estimate based on the most recent literature. EPA could consider higher estimates as sensitivity analysis, but a value as high as -1.0 is not supported by the literature to estimate the long-run elasticity. If EPA uses a value of -1.0, it should be as a sensitivity analysis that makes clear it is very conservatively focusing on a short-run estimate.

C. EPA Should Rethink the Unrealistically Conservative Assumption that Consumers Value Only 2.5 Years of Fuel Savings

EPA compounds how conservative its sales model is by applying its elasticity estimate to the change in "net price," by which EPA means the difference between technology costs and the estimated fuel savings over just 2.5 years. EPA bases the 2.5-year estimate on manufacturers' assumption about the limited extent to which consumers value future fuel savings, and EPA admits that the assumption "deserves further evaluation."[170]

As explored above in the section of these comments on consumer valuation, multiple market failures and consumer behavioral patterns explain why consumers may appear—in the baseline scenario—not to fully factor future fuel savings into their current purchasing decisions; yet once fuel economy increases under future regulations, consumers will fully value the actual fuel savings that show up as extra money in their bank accounts or wallets; and, over time, consumers may therefore begin to more fully account for fuel savings in future purchasing decisions. As stronger vehicle emissions standards begin to place more vehicles with higher fuel economy into the marketplace, consumers will see more of their friends and neighbors driving fuel-efficient vehicles, more marketing materials and dealership presentations on fuel-efficient vehicles, more charging stations and maintenance facilities to service fuel-efficient vehicles, more labels with higher MPG numbers, and so forth. As the regulations begin to correct some of the market failures that currently exist, and as the marketplace changes in response, consumer behaviors will change as well, and consumers will likely begin to factor fuel economy more into their purchasing decisions over time—though so long as some market failures continue to persist, consumers will continue to need the assistance of regulations to optimize the fuel economy of their vehicles. But by assuming that consumers currently only value 2.5 years' worth of fuel savings and will never value more, even as the market changes over time, is simply not a realistic assumption and is not consistent with the best available evidence or theories. EPA should therefore rethink this unrealistically conservative assumption in the future.

Respectfully,

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[170] DRIA, *supra* note 10, at 8-7.

Attachments:

- Inst. for Pol’y Integrity, Comments on The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks (Oct. 26, 2018)
- Peter Howard & Max Sarinsky, *Turbocharged: How One Revision in the SAFE Rule Economic Analysis Obscures Billions of Dollars in Social Harms* (2020)
- Bethany A. Davis Noll, et al., *Shortchanged: How the Trump Administration’s Rollback of the Clean Car Standards Deprives Consumers of Fuel Savings* (2020)
- Sylwia Bialek & Max Sarinsky, *Overinflated: The SAFE Rule's Overstated Estimates of Vehicle-Price Impacts* (2020)
- Brief for Inst. for Pol’y Integrity as Amicus Curiae, *Competitive Enter. Inst. v. Nat’l Highway Traffic Safety Admin.*, No. 20-1145 (D.C. Cir. Jan. 21, 2021)

Appendix: Table 1. Estimates of Vehicle Price Elasticity[171]

Author(s)	Year	Time Period	Short-Run	Long-Run
McAlinden et al. (2016) – cited in SAFE Rule				
Atkinson	1952	1925-1940	-1.33	-
Nerlove	1957	1922-1941; 1948-1953	-0.9	-1.2
Suits	1958	1929-1941; 1949-1956	-	-0.57
Chow	1960	1921-1953	-	-0.7
Suits	1961	1929-1941; 1949-1956	-	-0.675
Hymans, Ackley, and Juster	1970	1954-1968	-1.14	-0.46
Hess	1977	1952-1972	-1.63	-
Trandel	1991	1983-1985	-1.43	-
Levinsohn	1988	1983-1985	-0.82	-
McCarthy	1996	1989	-0.87	
Bordley	1993	Assumed	-1	
Fischer, Harrington, and Parry	2007	Not indicated	-1	-0.36
Irvine (1983) – basis for estimate in Kleit (1990), which was cited in SAFE Rule				
Dyckman	1975	1929-1962	-1.45	
Hamburger	1967	1954-1964	-1.17	
Evans	1969	1948-1964	-3.1	-1.5
Hymans	1970	1954-1968	-1.07	-0.36
Rippe and Feldman	1976	1958-1973	-1.14	-0.6
Carlson	1978	1965-1975	-1.1	
Additional Estimates in the Record – cited by agencies in SAFE Rule or prior rulemakings				
Goldberg	1998	1984-1990	-0.9	
Juster and Wachtel	1972	1949-1967	-0.7	
Lave and Train	1979	1976	-0.8	
McAlinden et al.	2015	1953-2013	-0.79	-0.61

[171] *Turbocharged*, *supra* note 165, at 7-8 (adapted from Petition for Reconsideration, *supra* note 164, at 43-45, with changes made consistent with James H. Stock et al., Comments to EPA & NHTSA on SAFE 2 Rule, Oct. 28, 2018; C. Fischer et al., *Should Automobile Fuel Economy Standards be Tightened?*, 28 ENERGY J. 1-29 (2007); and Benjamin Leard, *Estimating Consumer Substitution Between New and Used Passenger Vehicles* (RFF Working Paper 19-01, Aug. 2021), https://media.rff.org/documents/WP_19-01_rev_2021.pdf).

Table 1, cont.

Author(s)	Year	Time Period	Short-Run	Long-Run
Recent Estimates – not cited by agencies in SAFE Rule or prior rulemakings				
Berry et al.	2004	1993		-1
Stock et al.	2018	1967-2016		-0.06
Leard	2021	2013		-0.34
Bento et al.	2020	Not indicated		-0.13
Dou and Linn	2020	1996 to 2016	-1.5	
Averages				
Mean			-1.2	-0.6
Median			-1.1	-0.6
Averages of Recent Estimates				
Mean published since 1980			-1.0	-0.4
Median published since 1980			-1.0	-0.4
Mean published since 2000			-1.1	-0.4
Median published since 2000			-1.0	-0.4
Mean published since 2010			-	-0.3
Median published since 2010			-	-0.2
Averages Without Inconsistent Estimates[172]				
Mean			-1.1	-0.4
Median			-1.1	-0.5
Mean: Published since 2000			-1.1	-0.3
Median: Published since 2000			-1.0	-0.3

[172] This presentation of averages tests the sensitivity of the results to removing several estimates that may be inconsistent with current evidence and theory. Specifically, for this run, we remove: Nerlove (1957), because the long-run elasticity reported was higher than the short-run elasticity, which is inconsistent with current understanding of vehicles as comparatively inelastic; Evans (1969), because the long-run estimate is an extreme outlier suggesting that cars are elastic, contrary to current understandings; and Berry et al. (2004), because its elasticity value is assumed, not derived, *see also* Leard (2021) (on the inconsistencies with Berry et al.).