

Institute *for*
Policy Integrity

NEW YORK UNIVERSITY SCHOOL OF LAW

September 24, 2018

California Air Resources Board
VIA ELECTRONIC SUBMISSION

Subject: Comments on Notice of Public Hearing to Consider Proposed Amendments to the Low-Emission Vehicle III Greenhouse Gas Emission Regulation (Aug. 6, 2018)

The Institute for Policy Integrity at New York University School of Law¹ (“Policy Integrity”) respectfully submits the following comments on the California Air Resource Board’s (“CARB”) Notice of Public Hearing to Consider Proposed Amendments to the Low-Emission Vehicle III Greenhouse Gas Emission Regulation (“Notice”) and attached exhibits.² Policy Integrity is a nonpartisan think tank dedicated to improving the quality of government decisionmaking through advocacy and scholarship in the fields of administrative law, economics, and public policy. Policy Integrity regularly conducts economic and legal analysis on environmental and energy policies, including mobile source emission standards.

CARB has proposed to amend its Low-Emission Vehicle III Greenhouse Gas Emission Regulation to “clarify that the ‘deemed to comply’ option is available only for the currently adopted federal greenhouse gas regulations” in order to “ensure that the effects of any federal weakening for model years 2021 through 2025 are not felt in California during those model years.”³

These comments address two main points: (1) Economic evidence supports the feasibility of California’s vehicle emissions standards; and (2) CARB’s thorough Standardized Regulatory Impact Assessment could be further improved by updating its sensitivity analysis to account for the details of the recent proposal from the National Highway Traffic Safety Administration (“NHTSA”) and the Environmental Protection Agency (“EPA”) to roll

¹ No part of this document purports to present New York University School of Law’s views, if any.

² California Air Resources Board, Notice of Public Hearing to Consider Proposed Amendments to the Low-Emission Vehicle III Greenhouse Gas Emission Regulation (Aug. 6, 2018), *available at* <https://www.arb.ca.gov/regact/2018/leviii2018/leviii2018.htm> [hereinafter “Notice”].

³ Notice, *supra* note 2, at 5.

back the final vehicle emissions standards and Corporate Average Fuel Economy standards for 2021-2025,⁴ as well as the potential indirect effects of that proposal.

A. Feasibility of California’s Emissions Standards

In its *Staff Report: Initial Statement of Reasons* (“ISOR”), CARB explains that its emissions standards are technologically feasible and should be maintained, not weakened. In particular, CARB notes:

“California cannot accept radically less protective standards, especially because the extensive analysis of the [mid-term evaluation] process demonstrated the current standards are entirely appropriate. The evidence supporting the [mid-term evaluation] and provided in response to additional requests for comment showed the standards are technologically feasible, the benefits and fuel savings each outweigh the costs, and the standards have not inhibited sales. If anything, they could be strengthened.”⁵

In an earlier stage of this proceeding, Policy Integrity submitted comments explaining that economic evidence supports maintaining vehicle emissions standards at the level of California’s existing standards, and we reiterate those comments here. Policy Integrity released a report earlier this year detailing studies showing that the greenhouse gas emission standards for model years 2022 through 2025 are still feasible.⁶ Substantial research on emissions standards conducted by independent third parties and EPA itself shows that “the standards should be maintained.”⁷

Further details on the economic evidence supporting the feasibility of maintaining the approved standards through Model Year 2025 are available in Policy Integrity’s report, *Analyzing EPA’s Vehicle-Emissions Decisions*, which is attached as an exhibit to these comments.

⁴ The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks, 83 Fed. Reg. 42,986 (proposed Aug. 24, 2018) [hereinafter “Proposed Repeal”].

⁵ California Air Resources Board, Public Hearing to Consider Proposed Amendments to the Low-Emission Vehicle III Greenhouse Gas Emission Regulation, Staff Report: Initial Statement of Reasons 11 (Aug. 7, 2018), *available at* <https://www.arb.ca.gov/regact/2018/leviii2018/leviiiisor.pdf> [hereinafter “ISOR”].

⁶ BETHANY DAVIS NOLL, PETER HOWARD, AND JEFFREY SHRADER, INSTITUTE FOR POLICY INTEGRITY, ANALYZING EPA’S VEHICLE-EMISSIONS DECISIONS: WHY WITHDRAWING THE 2022-2025 STANDARDS IS ECONOMICALLY FLAWED at i-ii (2018), *available at* http://policyintegrity.org/files/publications/Analyzing_EPAs_Fuel-Efficiency_Decisions_Policy_Brief.pdf.

⁷ BETHANY DAVIS NOLL, PETER HOWARD, AND JEFFREY SHRADER, INSTITUTE FOR POLICY INTEGRITY, ANALYZING EPA’S VEHICLE-EMISSIONS DECISIONS: WHY WITHDRAWING THE 2022-2025 STANDARDS IS ECONOMICALLY FLAWED at i-ii (2018), *available at* http://policyintegrity.org/files/publications/Analyzing_EPAs_Fuel-Efficiency_Decisions_Policy_Brief.pdf.

B. Updating Sensitivity Analysis to Account for Federal Proposal and Potential Indirect Effects

CARB's *Standardized Regulatory Impact Assessment* ("SRIA")⁸ properly sets its baseline as "full compliance with all current State and Federal vehicle regulations," specifically, "federal GHG emission standards as of April 2, 2018."⁹ CARB then indicates that the proposed regulation is expected to result in no economic impacts on California because the interpretive change maintains the regulatory status quo. Further, CARB conducts a sensitivity analysis, where it "estimates the impacts of the proposed CA amendments under one foreseeable scenario of relaxed federal standards," where it "assumes the federal GHG emission standards are frozen at the [Model Year] 2021 levels."¹⁰ CARB's sensitivity analysis finds that the benefits of California maintaining its existing standards in the face of a frozen national standard would be expected to outweigh costs by billions of dollars for California during the period of 2021 to 2030.¹¹

In its letter commenting on CARB's SRIA, the California Department of Finance ("Finance") instructs: "Impact assessments for major regulations purposes compare the proposed regulation to the current regulations, which in this case yields no impacts."¹² However, Finance explains that under certain limited circumstances, CARB's proposal might have economic impacts. Finance elaborates: "[S]hould new federal standards for car model years 2022-25 be adopted, California's proposed amendments would keep emissions to around 92 MMT in 2030 versus around 103 MMT if automakers" could use those new lower federal standards. In this case, Finance states: "Vehicle costs would be around \$600 higher in California, with direct costs proportional to the number of vehicles sold." Further, according to Finance: "Businesses and individuals would also benefit from lower operating costs of more efficient vehicles, and the emission reductions would help to meet California's overall goal of around 260 MMT per year by 2030."

Finance then instructs CARB that under the limited circumstances in which CARB's proposal might have an economic impact, it should conduct further modeling to assess the

⁸ Note that CARB developed its SRIA voluntarily, as the proposed regulation is not expected to result in economic impacts sufficient to qualify as a "major regulation." See Cal. Code Reg., tit. 1, §§ 2000(g) & 2002(a)(1).

⁹ California Air Resources Board, Proposed Amendments to the Low-Emission Vehicle III Greenhouse Gas Emission Regulation, Standardized Regulatory Impact Assessment (SRIA) Equivalent Document (Aug. 7, 2018), *available at* <https://www.arb.ca.gov/regact/2018/leviii2018/appd.pdf> [hereinafter "SRIA"].

¹⁰ SRIA, *supra* note 9, at A-1.

¹¹ SRIA, *supra* note 9, at A-6 to A-7.

¹² Letter from Irena Asmundson, Chief Economist, California Department of Finance, to Emily Wimberger, Chief Economist, California Air Resources Board (July 10, 2018), *available at* http://www.dof.ca.gov/Forecasting/Economics/Major_Regulations/Major_Regulations_Table/documents/ARB_Vehicle_Emissions_Compliance_Amendments-Finance_Comments_2018.pdf [hereinafter "Finance Letter"].

scope of that impact. Finance states that it “generally concurs with [CARB’s] methodology used to estimate impacts of proposed regulations.” However, it instructs that “[i]f the federal standards were to change, the timing and details would be important to model in order to assess any impacts to California.” CARB responds to Finance’s comments by indicating that it “will update the analysis in the Standard Form 399 and other documents, as appropriate, if there are any developments at the federal level.”¹³

Indeed, since CARB developed its SRIA, in August 2018 the federal government has issued a Notice of Proposed Rulemaking that proposes to freeze federal emissions and fuel economy standards at Model Year 2020 levels.¹⁴ The economic analysis accompanying the federal Notice of Proposed Rulemaking suffers from many flaws, which we will not address in detail here.

As it stands now, the Notice of Proposed Rulemaking weakening the federal standards is unlikely to be finalized before CARB has finalized these proposed amendments to its Low-Emission Vehicle III Greenhouse Gas Emission Regulation.¹⁵ However, if the federal revisions were to be finalized before CARB adopts these proposed amendments, the agency would need to conduct further analysis to comply with Finance’s recommendations.

In that case, CARB would need to update its sensitivity analysis to model the potential economic effects in California from the nationwide standards freezing in Model Year 2020, rather than Model Year 2021. As the Finance letter notes, “if [CARB’s] sensitivity analysis captures most of the components, only the magnitudes of estimates may change.”¹⁶ That is, CARB’s sensitivity analysis already addresses factors that may affect economic outcomes from California maintaining its stricter standards in the face of federal laxity; if the modeling already addresses the key factors at play, the results of an updated analysis will likely be similar.

In the process of updating its sensitivity analysis, CARB should consider broadening the range of effects accounted for in its analysis. According to Finance regulations, for a major regulation, CARB must account for “all costs or all benefits (direct, indirect and induced) of the proposed major regulation on business enterprises and individuals located in or doing business in California.”¹⁷

¹³ ISOR, *supra* note 5, at 33.

¹⁴ Proposed Repeal, *supra* note 4; *see* SRIA, *supra* note 9, at 7 (“While there has not yet been a release of a Notice of Proposed Rulemaking (NPRM), in this analysis, CARB assumes the federal standard will be changed and will conduct further economic analyses based on any proposed changes if they are issued.”).

¹⁵ The current due date for comments on the proposed federal rule is October 26, 2018, and CARB is scheduled to consider these proposed amendments at the September 27, 2018 Board hearing, so unless CARB extends its consideration process, the federal rule will not be finalized before CARB’s amendments.

¹⁶ Finance Letter, *supra* note 12, at 1.

¹⁷ Cal. Code Reg., tit. 1, §§ 2000(e) & 2002(b).

Indirect effects that CARB might consider including in its updated analysis include potential effects that the California program might have on emissions reductions in other states and potential effects on vehicle safety. Note that one study of an earlier version of California's greenhouse gas vehicle emissions standards, written by Lawrence H. Goulder *et al.*, found that under some conditions, stricter vehicle emissions standards in California, in the presence of a weaker federal standard, might lead to increased vehicle emissions in other states.¹⁸

There are reasons to interpret the results of this Goulder study in a limited fashion. First, the amount of leakage that could potentially be attributed to a California-specific standard is lower than initial examination of the paper might suggest. Figure 6.3 in the paper shows that even if the California standard was replaced by a federal standard, there would still be some leakage through the used car channel—about 20% of the market. Therefore, the leakage attributable to the California standard is lower than other calculations in the paper might suggest. Second, the Goulder paper does not sufficiently account for the role of consumer preferences. Particularly where automobile manufacturers have market power, automakers may price cars in accordance with consumer preferences to maximize rents; this could also have the effect of preventing emission leakage. Further, the paper relies on many assumptions, which may not hold and could affect the validity of the paper's findings upon further examination. For example, the paper assumes that manufacturer compliance levels are close enough to the federal limits to make leakage likely, but many manufacturers are ahead of the game in compliance, making leakage less likely.¹⁹ As another example, the paper's assumption about the level of the elasticity of scrappage diverges from studies that have empirically calculated this parameter, such that the Goulder study might artificially inflate leakage values.²⁰

Note also that the Goulder paper omits a significant co-benefit from stricter California standards: a reduction in fatalities. This reduction in fatalities would occur as states adopting California's stricter standards shift towards smaller vehicles and non-adopting states shift towards larger vehicles.²¹ Specifically, narrowing of the weight distribution of

¹⁸ See Lawrence H. Goulder *et al.*, *Unintended Consequences from Nested State and Federal Regulations: The Case of the Pavley Greenhouse-Gas-Per-Mile Limits*, 63 J. OF ENVTL. ECON. & MGMT. 187 (2012).

¹⁹ See, e.g., Paul Bledsoe, *Trump's Fuel Efficiency Rollbacks Will Hurt Drivers*, N.Y. TIMES (May 11, 2018), available at <https://www.nytimes.com/2018/05/11/opinion/trump-fuel-efficiency-rollbacks.html>; Nic Lutsey, *Are Automakers Beating the U.S. Vehicle Fuel Economy Standards?*, INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION (Nov. 2, 2016), available at <https://www.theicct.org/blogs/staff/automakers-beating-US-vehicle-fuel-economy-standards-bigly>.

²⁰ Compare Goulder *et al.*, *supra* note 18 (assuming an elasticity of scrappage of -0.1) with, e.g., Mark R. Jacobsen & Arthur A. van Benthem, *Vehicle Scrappage and Gasoline Policy*, 105 AM. ECON. REV. 1312 (2015) (finding an elasticity of scrappage of -0.7) and Antonio Bento *et al.*, *Vehicle Lifetime and Scrappage Behavior: Trends in the U.S. Used Car Market*, 39 THE ENERGY J. 159 (2018) (finding an elasticity of scrappage of -0.4).

²¹ See Goulder, *supra* note 18, at 198.

vehicles in both adopting and non-adopting areas would decrease fatalities in all states, regardless of their adoption choice.²² While increased sales of used vehicles in adopting states may mitigate these benefits slightly, these effects are relatively small²³ and likely to decline over time as heavier cars eventually age out of the fleet in adopting states. Adopting states would experience significant benefits as the regulation helps to mitigate the “arms race” on the road, where consumers are continually forced to increase the size of their vehicles to compete with other drivers for status and to reduce the safety externalities imposed by larger vehicles.²⁴

Moreover, the peer-reviewed literature supports a finding that overall reductions in weight improve vehicle safety, holding the vehicle distribution constant.²⁵ Based on this analysis, in addition to the safety benefit from aggregating similar vehicle sizes together, as described above, CARB’s proposal can be expected to result in safety benefits to the extent that it encourages light-weighting.

In updating its sensitivity analysis to account for the details of the federal regulatory changes, CARB should consider not only expanding the analysis to include freezing federal standards in Model Year 2020, but also additional indirect effects of California maintaining its standards, such as vehicle safety considerations and potential emission effects in other states.

Respectfully submitted,

Denise A. Grab
Institute for Policy Integrity
New York University School of Law

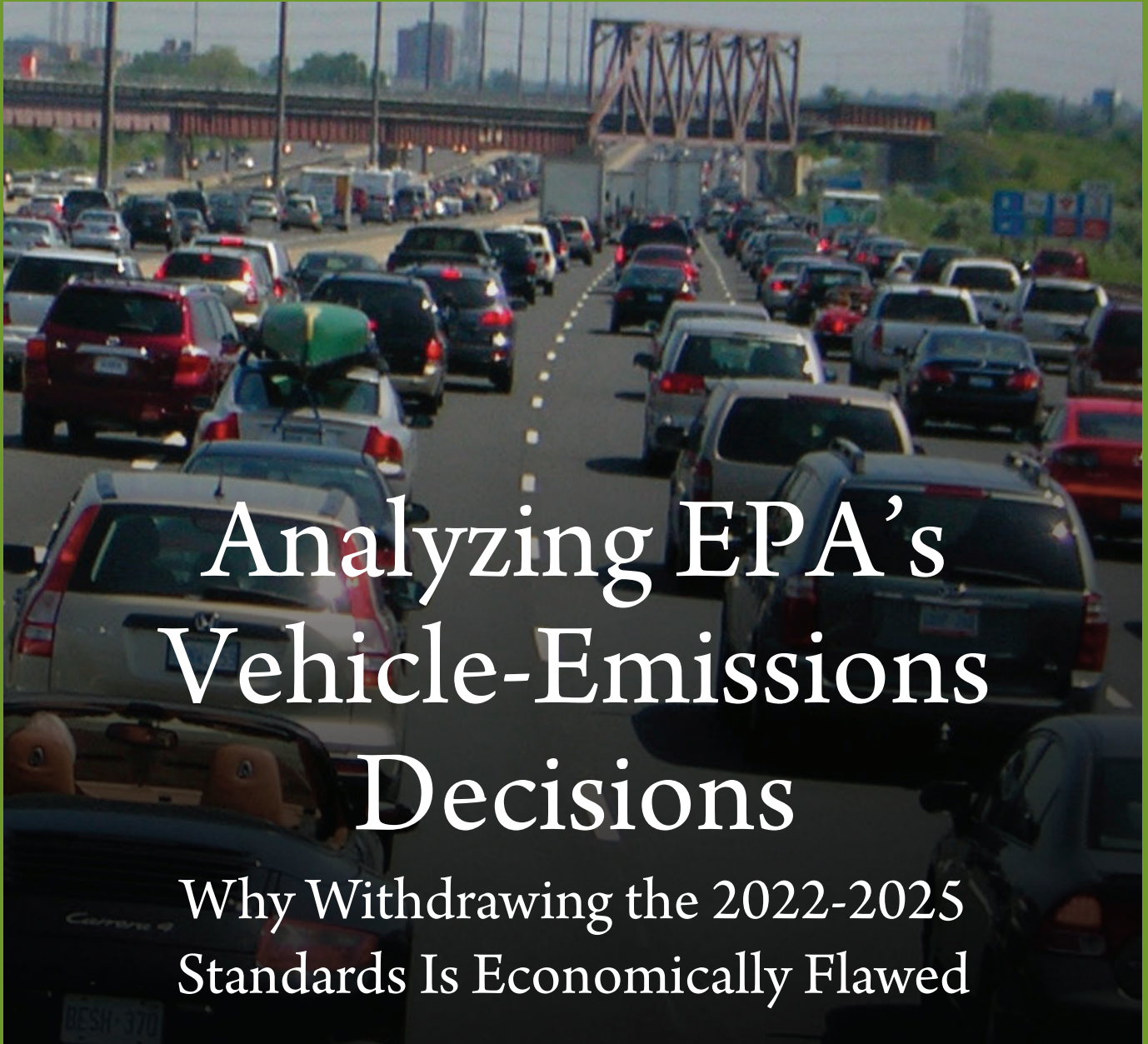
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²² Antonio Bento et al., *The Effect of Fuel Economy Standards on Vehicle Weight Dispersion and Accident Fatalities* (Nat’l Bureau of Econ. Research, Working Paper No. 23340, 2017); Reza Tolouei, *Carbon Policies Targeting Road Transport: Is There a Safety Consequence?*, 8 TRANSPORTATION RESEARCH PROCEDIA 259 (2015).

²³ See Goulder et al., *supra* note 18.

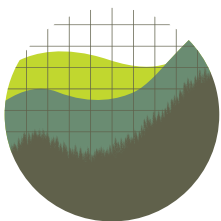
²⁴ Comments from Sylwia Bialek & Jeffrey Shrader, Economics Fellows, Institute for Policy Integrity, to Elaine L. Chao, Secretary, Department of Transportation & E. Scott Pruitt, Administrator, Environmental Protection Agency, Re: Request for Comments on Reconsideration of the Final Determination of the Mid-Term Evaluation of Greenhouse Gas Emissions Standards for the Model Year 2022-2025 Light Duty Vehicles at 13 (Oct. 5, 2017), available at [https://policyintegrity.org/documents/CAFE_standards_jobs_and_preferences_-_Institute_for_Policy_Integrity_\(003\).pdf](https://policyintegrity.org/documents/CAFE_standards_jobs_and_preferences_-_Institute_for_Policy_Integrity_(003).pdf).

²⁵ Bento et al., *supra* note 23; Tolouei, *supra* note 23.



Analyzing EPA's Vehicle-Emissions Decisions

Why Withdrawing the 2022-2025
Standards Is Economically Flawed



Institute *for*
Policy Integrity

NEW YORK UNIVERSITY SCHOOL OF LAW

May 2018

Bethany Davis Noll
Peter Howard, Ph.D.
Jeffrey Shrader, Ph.D.

Executive Summary

In 2012, the Environmental Protection Agency (EPA) set emissions standards for model year 2017 through 2025 cars and light trucks. In 2016 and 2017, EPA conducted and published extensive analyses of the 2022 to 2025 portion of those standards. Based on these analyses, EPA made a Final Determination in January 2017, finding that the 2022–2025 standards were feasible and that the benefits of the policy substantially outweighed the costs. Recently, however, EPA withdrew the 2017 Final Determination, claiming that changing conditions between 2017 and 2018 mean that the standards are not feasible. According to EPA, the standards were based on “outdated information” and “more recent information suggests that the current standards may be too stringent.” But rather than point to any new data or analysis to support those conclusions, the agency simply cites concerns that factors such as (1) fuel prices, (2) availability of technology, (3) cost to consumers, (4) cost of compliance, and (5) impact on automobile safety required further consideration. A review of the evidence demonstrates that EPA’s concerns are unfounded.

In this policy brief, we show that in withdrawing the 2017 Final Determination, EPA has arbitrarily ignored substantial research on emissions standards conducted by independent third parties and EPA itself, and that the agency is failing to take into account important data showing that the standards are still feasible. Fuel prices and price forecasts support maintaining the standards. Fuel price changes since 2012 do not alter the basic finding that the benefits of the 2022–2025 standards outweigh the costs. Current fuel price changes and forecasts of future prices are also essentially unchanged relative to the projections EPA used when assessing the 2017 Final Determination. Forecasts show that fuel prices are expected to continue rising steadily over the life of the standards. These forecasts have consistently shown this trend for the last three years. With rising fuel prices, more consumers will prefer fuel-efficient vehicles. As such, standards that lead to higher fuel efficiency will deliver larger benefits to consumers in terms of money saved at the gas pump.



In addition, consumer purchases of hybrid and electric cars have risen over the last two years, and consumers are purchasing fully electric cars in record numbers. The pace at which electric cars are being purchased greatly exceeds assumptions made by EPA in 2012, when it set the standards, and in 2017, when it issued the Final Determination. Due to this trend, the standards will likely be easier to meet than originally expected.

In withdrawing the 2017 Final Determination, EPA also overlooks important elements of the preexisting fuel-standard regulations, which help ensure that the standards are feasible and achievable. First, automakers generate compliance credits by selling any vehicle that exceeds the standards. Such credits can be used to offset emissions by less efficient vehicles, meaning that an automaker can comply with the standards even if some of the vehicles they sell do not meet the emissions limits. With the rise in electric-vehicle sales, automakers should be especially well-placed to comply because the regulations allow manufactures to generate extra compliance credits through sales of those vehicles. Second, the standards automatically adjust if consumers start purchasing larger vehicles or less-efficient trucks and SUVs. These larger vehicles do not need to meet as strict of emissions targets, making it easier for automakers who sell more of these vehicles to meet the standards. This automatic adjustment of the targets to be more lenient for larger vehicles, known as the “footprint standard,” also helps automakers maintain vehicle safety while improving fuel efficiency, by encouraging automakers to build cars with larger crumple zones. Even if EPA’s concerns about consumer adoption of fuel-efficient vehicles and compliance costs for automakers were valid, these features of the regulations make compliance more feasible.

The 2017 Final Determination was well supported by substantial analysis, and, as this policy brief demonstrates, the agency’s previous judgment that the 2022–2025 standards are feasible and beneficial is based on data and assumptions that remain sound. EPA has provided no economic evidence to support withdrawing those standards. Instead, economic data and research indicate that the standards should be maintained and that revising the standards would lead to costly uncertainty for automakers and the public.

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Background

EPA sets emission standards for cars and light trucks (“light-duty vehicles”) sold in the United States. These standards place a limit on the average emissions of greenhouse gases from new vehicles sold by each automaker.¹ In 2012, EPA, in partnership with the National Highway Traffic Safety Administration (NHTSA), set standards for cars and light trucks sold in model years 2017 to 2025 (“2012 Final Rule”).² At the same time, the agencies committed to a “midterm evaluation” of the 2022–2025 portion of those standards, to be published “no later than April 1, 2018.”³ The midterm evaluation would evaluate the appropriateness of the 2022–2025 standards “based on an updated assessment of all the factors considered in setting the standards and the impacts of those factors on the manufacturers’ ability to comply.”⁴ In 2016 and 2017, EPA conducted the mid-term evaluation, and on January 12, 2017, it issued a Final Determination (“2017 Final Determination”),⁵ finding that the standards were appropriate and would result in substantial improvements in economic welfare.⁶

On April 13, 2018, EPA withdrew the 2017 Final Determination (“Withdrawal”), claiming that the standards are “not appropriate” because “it is clear” that key assumptions underlying the 2017 Final Determination “no longer represent realistic assumptions.”⁷

In this policy brief, we review the current evidence underlying those assumptions. Our review shows that EPA’s claim—that new information indicates that the assumptions underlying the 2017 Final Determination are unrealistic—is not supported by the evidence. In fact, the opposite is the case. Recent trends in fuel prices, vehicle sales, automaker compliance, and safety all indicate that the existing 2022–2025 standards can be met at low cost while delivering large benefits to consumers and the economy. EPA’s decision to withdraw the standards will instead cause costly policy uncertainty that will hurt the automotive sector while also harming the environment.

Impact of the Standards on Fuel Savings

Fuel prices are rising, and fuel price forecasts have not changed substantially since the 2017 Final Determination

The price of gasoline is an important factor in consumer decisions on whether to purchase vehicles and what kind of vehicles to purchase. EPA regulations require that the agency examine the effect that fuel prices have on the feasibility of emissions standards.⁸ In the Withdrawal, EPA asserted that “key assumptions” regarding fuel prices underlying the 2017 Determination were unrealistic.⁹ According to EPA, lower fuel prices may “mean lower incentives for consumers to purchase fuel-efficient vehicles,” and the lower incentives will make it harder for automakers to meet the standards.¹⁰ But EPA’s claim mischaracterizes its own recent analyses and also ignores actual changes to fuel prices and price forecasts, all of which show that the standards can be met.

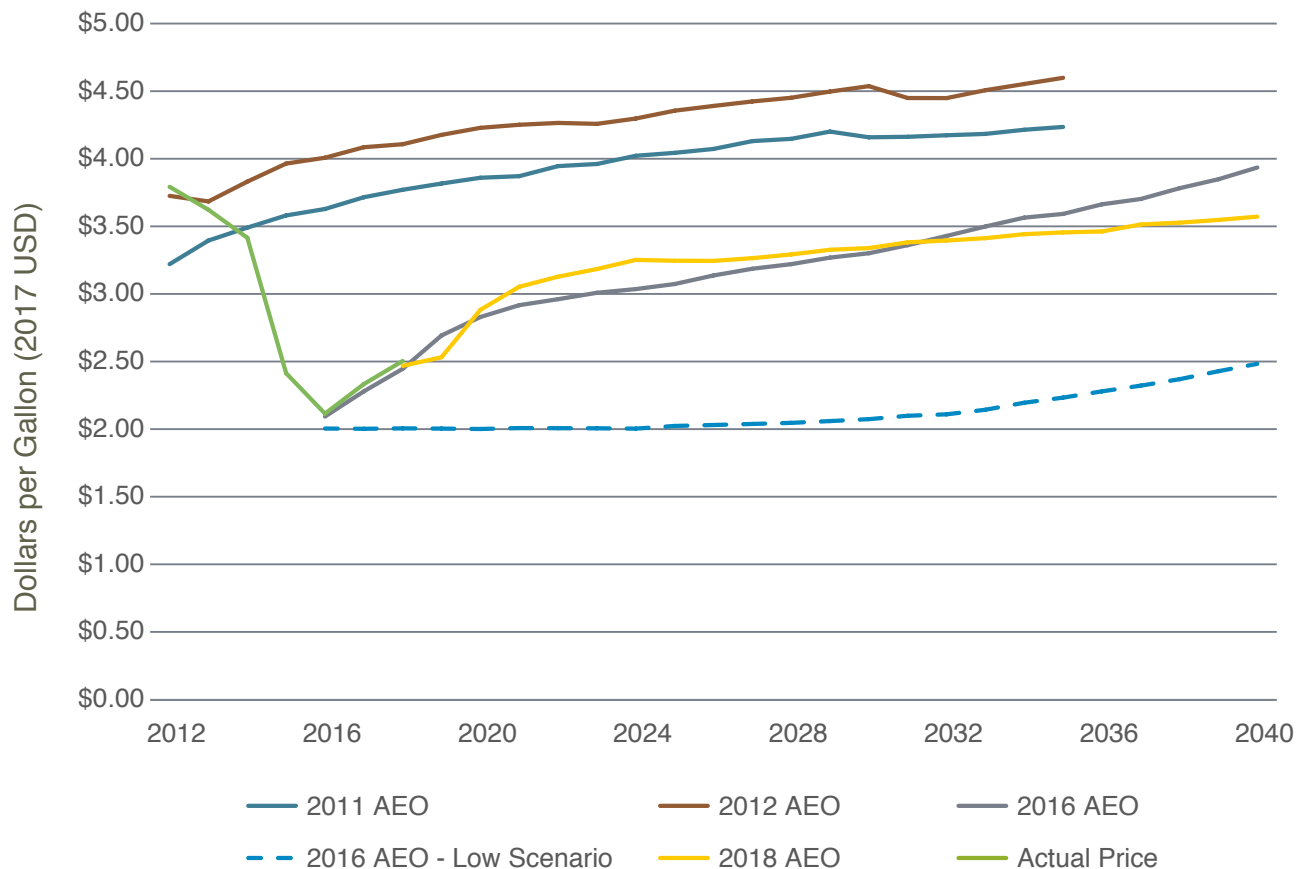
Fuel price forecasts have been stable over the last three years. When estimating future prices, EPA uses forecasts from the Energy Information Administration (EIA). For the 2017 Final Determination, EPA’s central analysis used the EIA Annual Energy Outlook 2016 (2016 AEO) forecast of gasoline prices. Comparing the 2016 forecast to the most recent forecast,

released in 2018, the expected fuel price is essentially identical. Figure 1 shows that for the 2022–2025 period, the 2016 forecast and the 2018 forecast differ by, at most, 22 cents (7% of the 2018 forecast price), and that the 2018 forecast is higher than the 2016 forecast over this time period. The similarity of the forecasts used in the 2017 Final Determination and the Withdrawal directly refutes EPA’s claim that new data support withdrawing the 2017 Final Determination now.

In the 2017 Final Determination, EPA also addressed the issue of whether lower fuel prices since 2012 would make the standards infeasible. The agency found, in light of the industry’s significant progress in complying with the standards, the projected costs of the standards, and projected fuel prices (among other factors) that the standards should not be revised.¹¹ As fuel prices and forecasts of those price have not changed materially from that time, EPA’s analysis in the 2017 Final Determination should continue to hold.

In addition, EPA’s analysis in the 2017 Final Determination demonstrated that even lower fuel prices would not support reducing the standards. EPA conducted numerous sensitivity analyses around the fuel price forecast as part of the 2017 Final Determination. Of particular relevance to the recent withdrawal, the 2017 Final Determination included low price scenarios involving much lower fuel prices than those that have occurred recently or are expected to occur in coming years (See Figure 1 “2016 AEO – Low Scenario”). EPA found that, “[e]ven with the lowest fuel prices projected by AEO 2016 . . . approximately \$2 per gallon in 2025, the lifetime fuel savings significantly outweigh the increased lifetime costs.”¹²

Figure 1: Gasoline Price Forecasts



Note: All values are the price for transportation sector motor gasoline.
 Source: EIA AEO 2011, 2016, and 2018; EIA 2012 Early Release.¹³

Recent forecasts also all show that the most likely outcome for fuel prices is that they will rise steadily over the next few years, from about \$2.75 per gallon of gasoline currently to about \$3.50 by 2035. The most recent forecast, AEO 2018, shows that until at least 2032, fuel prices will be higher than EPA expected at the time of its 2017 Final Determination. Those rising fuel prices will give consumers an increased incentive to buy fuel-efficient cars, helping address concerns over manufacturers' ability to comply with the standards.¹⁴

EPA also claims that the fuel price assumptions underlying the 2012 Final Rule were “optimistic,” and that lower fuel prices since 2012 decrease the ability of manufacturers to comply with the standards, relative to those earlier forecasts.¹⁵ But EPA accounted for the possibility of lower fuel prices in the 2012 Final Rule and found that the standards were still achievable.¹⁶ The Withdrawal ignores that analysis. The 2012 Final Rule was supported by a Regulatory Impact Analysis that looked at two main fuel price forecasts: the Energy Information Administration AEO 2011 and the 2012 Early Release report.¹⁷ It is true that both of these forecasts turned out to be higher than realized prices. But the difference was not as significant for the AEO 2011 forecast. That forecast was substantially lower than the 2012 Early Release and it lines up more closely to current fuel price forecasts than the 2012 Early Release.¹⁸ In fact, by 2025 the 2011 forecast is expected to be 75 cents (23%) higher than the most recent AEO forecast (see Figure 1). When EPA analyzed the standards for the 2012 Final Rule using the lower prices forecast in the AEO 2011, EPA found that automakers would easily be able to meet the standards.¹⁹ In claiming that the 2017 Final Determination needs to be withdrawn, the agency ignores the use of the AEO 2011 forecasts and focuses only on the use of the 2012 Early Release values.

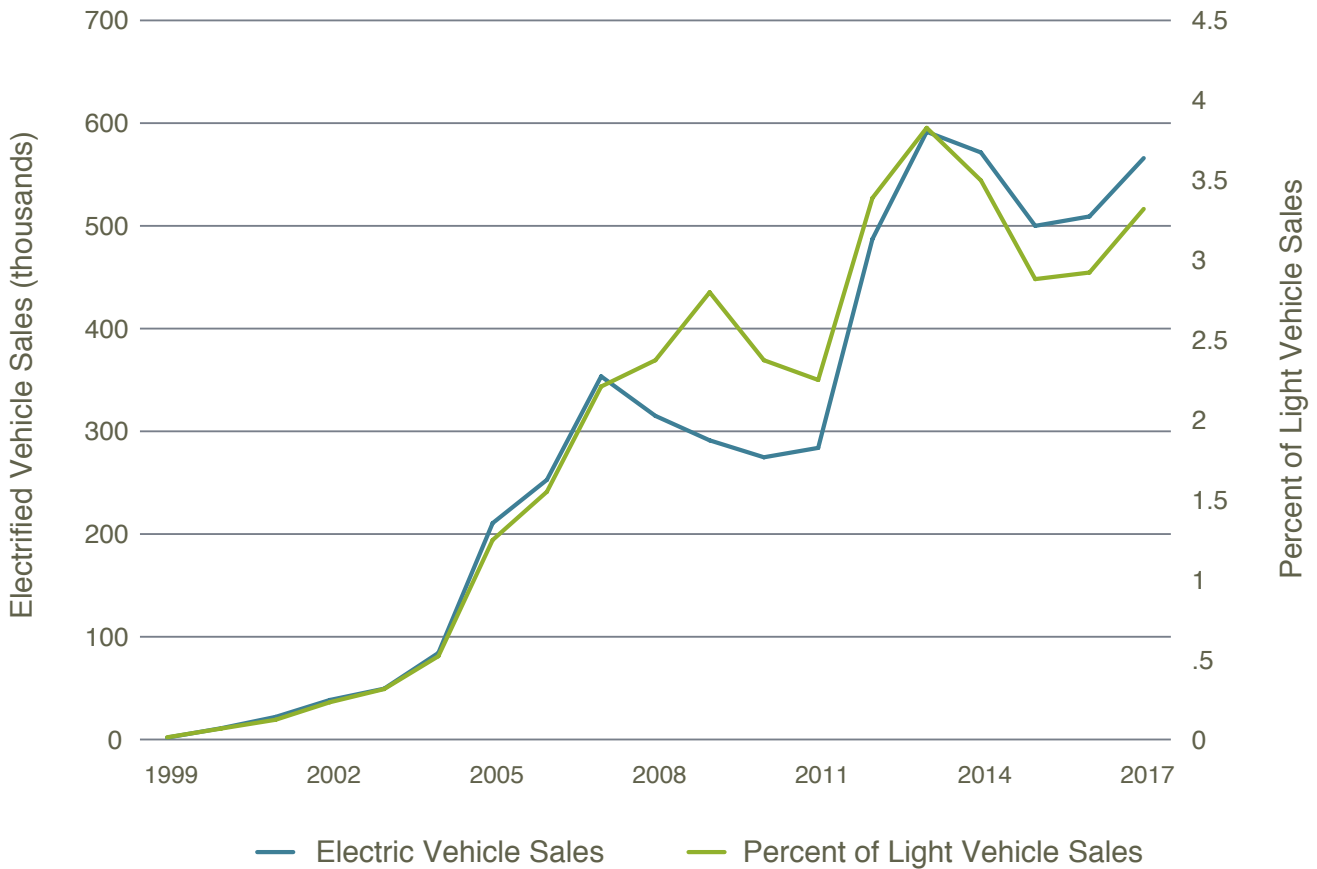
In sum, gas prices do affect the benefit that consumers derive from fuel-efficiency changes and the demand for fuel-efficient vehicles. But EPA's claim that current trends in fuel prices will affect manufacturers' ability to comply with the standards is not supported. During the process of creating and evaluating the 2022–2025 standards, EPA used multiple forecasts of fuel prices and conducted sensitivity analyses with lower prices than those that have been realized. In all cases, EPA found that the standards could be met and that they would deliver benefits to consumers that outweigh the costs. Rising gas prices are also already inducing consumers to purchase more efficient vehicles. Projected future fuel price increases mean that this trend is likely to continue.

Availability and Effectiveness of Technology

Sales of electric and hybrid vehicles are growing

In the Withdrawal, EPA claims that low gas prices are causing purchases of electrified vehicles to fall from a peak in 2013.²⁰ According to EPA, this calls into question the assumptions underlying both the 2012 Final Rule and the 2017 Final Determination.²¹ To support its claim, EPA copies a figure from an auto-industry analysis showing that through the beginning of 2016, sales of electrified vehicles have fallen as a share of total vehicle sales.²² However, the same industry group released an updated analysis prior to the publication of the Withdrawal,²³ showing that electrified vehicle sales have actually grown for the last two years, both in absolute terms and as a fraction of overall new vehicle sales (see Figure 2).²⁴ This result is not surprising given that gas prices have also been steadily climbing for the last two years.²⁵

Figure 2: Sales of Electrified Vehicles



Notes: Electrified vehicles includes both fully electric and hybrid vehicles.

Source: Center for Automotive Research citing data from Ward’s Automotive Reports, Hybridcars.com, and EIA.

Focusing in particular on sales of fully electric cars and trucks, the data are even clearer: 2017 was a record year for sales of electric vehicles. There were 199,826 electric vehicles sold in 2017, an increase of 25% relative to 2016, substantially outpacing growth in sales of vehicles overall.²⁶ Currently, electric vehicles constitute just over 1% of all new vehicles sold in the United States.²⁷ In the 2017 Final Determination, EPA found that the 2022–2025 standards would be achievable if even 2% of new vehicle sales are electric by 2025.²⁸ If sales continue to grow at their current rate, then electric vehicle sales will be at least double this amount by 2025. Current projections from the EIA show that fully electric vehicles are predicted to be 5.5% of new car sales by 2025.²⁹

Electric vehicle sales are particularly valuable to automakers when it comes to meeting EPA’s emissions standards. Since 2017, electric vehicles have allowed automakers to earn credits that can be used to meet compliance shortfalls due to sales of less-efficient vehicles. The credits earned by electric vehicles are especially valuable, because they also earn a “multiplier incentive” from EPA. Any credit earned for sale of an electric vehicle in 2017 through 2019 is doubled. Credits earned in 2020 are worth 1.75 traditional credits, and in 2021, they will be worth 1.5 traditional credits.³⁰ In addition to using these credits to meet their own compliance obligations, automakers can also sell these credits to other automakers or bank them (for up to five years) for use in the future.³¹ As such, the electric-vehicle credits give automakers substantial flexibility when meeting the standards. In 2012 Final Rule and the 2017 Final Determination, EPA found

that the standards would be achievable with improvements to internal combustion vehicles and low sales of fully electric vehicles. Therefore, given the significant benefits that electric-vehicle sales provide to manufacturers seeking to comply with the standards, the high, recent projections of sales of electric vehicles indicate that automakers will have an easier time meeting the standards than EPA could have expected in 2012 or even when analyzing the Final Determination in 2016 and 2017.

Cost to Purchasers

Vehicle affordability should improve under the standards, particularly for lower-income households

Vehicle sales could potentially drop if fuel-efficiency gains are wholly offset by increased vehicle prices caused by design changes to meet emissions standards. As part of the 2017 Final Determination, however, EPA found that even in low fuel-price scenarios, purchasers' lower gas payments due to higher efficiency more than offset increases in up-front vehicle costs.³² Now, in withdrawing the 2017 Final Determination, without citing any support or conducting any new analysis, EPA is claiming that vehicles may be less affordable, particularly for low-income buyers, and that this may decrease fleet turnover.³³ These claims are not supported by EPA's own prior analysis or by independent studies.

For instance, a study by Synapse Energy Economics, cited by EPA in the Withdrawal,³⁴ shows that over the last 10 years, the price of lower-cost vehicles has remained constant despite recent increases in the stringency of standards. The study shows that the range of prices of new vehicles has increased, but those increases occurred because the price of high-end vehicles has gone up as more features have been added.³⁵ The price of more affordable vehicles, on the other hand, has not changed. Similar findings were also reported in EPA's own analysis leading up to the 2017 Final Determination. In that analysis, EPA found that car sales recovered to pre-recession sales levels by 2015 under increasing fuel-efficiency standards and have continued to rise since then.³⁶

Moreover, because low-income consumers spend a relatively larger fraction of their income on fuel than on the up-front price of their vehicles compared to high-income households, fuel-efficiency increases are more beneficial to low-income consumers than they are to high-income consumers.³⁷ In other words, weakening the 2022–2025 standards will not help low-income consumers. Instead, reducing the standards will likely harm these consumers the most. As Greene and Welch note, “[The 2022–2025] fuel economy improvements will benefit all income groups and . . . the impacts will be progressive. The highest income quintile is projected to average a savings of 0.5% of their income annually, increasing uniformly to 2.2% of income saved annually for the lowest income quintile.”³⁸ The evidence on turnover and the impact of the 2022–2025 fuel-economy standards on low-income consumers does not support EPA's decision to withdraw the 2017 Final Determination.

Feasibility of the Standards

By using banked credits, automakers are indicating that they do not expect their future compliance costs to be high

EPA also claims that the standards may not be feasible, pointing to recent data showing that in 2016 some automakers used banked credits to meet their compliance obligations.³⁹ EPA asserts that the use of banked credits “suggests” that the program is already too stringent and that it will become increasingly difficult for automakers to comply in the future.⁴⁰ This logic, however, is backwards. Automakers are trying to maximize their own profits, so they will take the action that they expect will deliver the highest revenue with the least expense. If the automaker determines that using a banked credit now will deliver them higher profit than any other means of meeting their compliance obligation, then they will use that banked credit. If the automaker expects that the credit can be saved and used to deliver higher profits in the future, then it will instead save that credit. Therefore, use of credits is not proof that the automakers cannot comply with the standards. To see this, consider the alternative. Automakers could use their credits now, but then in the future (when they are claiming that costs will be higher), they will not have those credits available for use. In that case, the automaker would need to pay more in the future than they would have paid had they saved the credit by complying now. One reason for this belief might be the generous electric vehicle credits discussed above.⁴¹

In any event, the preexisting legal framework provides automakers with compliance flexibility to ensure that they can reduce emissions cost effectively. Credit banking itself is one of the features that provides automakers with flexibility. If an automaker plans to release a new, more fuel-efficient version of a vehicle in the next model year, that automaker can use credits to meet compliance obligations this year. Automakers can also trade credits meaning that each individual automaker has flexibility in whether it meets the standard by purchasing credits or through changes to vehicles. Manufacturers that make and sell more efficient fleets will generate a bank of credits that they can sell to less-efficient manufacturers.⁴² EPA has completely ignored these features of the program in its Withdrawal.

In addition, to support the Withdrawal, EPA cites automaker concerns that consumer demand for more light trucks will make it difficult to comply with the standards,⁴³ but that concern is misplaced. The standards that automakers need to meet are for average emissions across their entire fleet of vehicles sold, not for each individual vehicle. Each vehicle has an emissions target that it is expected to meet, but the automaker only needs to meet that target on average across all of the vehicles they sell. Because of this, the standards automatically adjust in two ways in response to consumer demand to make it easier for automakers to comply. First, light trucks (like pickups and SUVs) have different, more lenient emissions targets than cars.⁴⁴ This means that if consumers demand relatively more light trucks than cars, the standard that the automaker needs to meet will automatically become less stringent. Second, the targets are less stringent for larger vehicles (measured by the “footprint” of the vehicle, which is the area between the wheels).⁴⁵ For instance, by 2021, the target for a light truck that has a footprint of 42 square feet (around the size of a Buick Encore, a compact SUV) is currently set at 200 grams of CO₂ released per mile of driving. For a larger light truck with a footprint of 75 square feet (like a Ford F-150), the target is set at about 330 grams of CO₂ per mile of driving.⁴⁶ In other words, larger vehicles do not need to meet as strict of targets, so the standard that an automaker that sells larger vehicles needs to meet is less stringent than the standard for an automaker that sells smaller vehicles. These automatic adjustments insulate manufacturers from some of the effects of changes in consumer demand.⁴⁷

Impacts of the Standards on Automobile Safety

There is no evidence that the 2022–2025 standards will negatively affect safety

As a further justification for the Withdrawal, EPA cites a desire to study safety, without providing any evidence that the 2022–2025 standards will affect safety in a negative way.⁴⁸ The idea that the 2022–2025 standards will affect safety runs counter to expert opinion and research. Traditionally, the main concern raised with respect to safety is “lightweighting,” or the process where an automaker reduces the mass of a car to improve fuel efficiency. The National Academy of Sciences (2015) has found that mass reductions, when not combined with size reductions, do not negatively affect safety. Instead, such mass reductions may even improve safety along with other desirable car attributes (including responsiveness, acceleration, and stopping).⁴⁹ Under the current regulation (the footprint standards), manufacturers receive credit for reducing mass but not for reducing the size of cars, helping to ensure that the size of cars is maintained when manufacturers reduce mass to make cars more fuel-efficient.⁵⁰ In its Withdrawal, EPA does not mention the footprint standards or other features of the regulation that make automaker compliance easier while also minimizing undesirable effects.

Historical evidence also shows that the 2022–2025 standards will not negatively affect safety. Specifically, the National Academy of Sciences found that “the empirical evidence from historical data appears to support the argument that the new footprint-based standards are likely to have little effect on vehicle safety and overall highway safety.”⁵¹ The empirical evidence is particularly strong that removing more mass from heavier cars and less mass from lighter cars to meet higher fuel efficiency standards (as the NAS expects to occur under these regulations)—while maintaining the current size mix of cars—will maintain overall social safety.⁵²

Appropriate Lead Time

EPA’s withdrawal of the 2022-2025 emissions standards will hurt consumers and will create regulatory uncertainty for automakers

By withdrawing the 2017 Final Determination, EPA is creating unnecessary and costly regulatory uncertainty. Generally, manufacturers need approximately 18 months of lead-time to prepare compliance plans for a model year.⁵³ In fact, at any particular time, car manufacturers are often making compliance plans that reach into the future much further than 18 months.⁵⁴ Any expenses that automakers have already incurred to meet the 2022–2025 standards are sunk costs. The question is whether those costs have been incurred for a good reason. If EPA weakens the standards, it might save some of the higher-emitting automakers money on continued research and development of new vehicles, but such a change will render their investments so far worthless.

In the 2017 Final Determination, EPA found that changing the standards would “disrupt the industry’s planning for future product lines and investments” and that retaining the standards would promote regulatory certainty.⁵⁵ EPA now asserts that any regulatory certainty provided by the 2017 Final Determination would be undermined in any event because NHTSA has not made a final determination on its own 2022–2025 Model Year GHG standards.⁵⁶ But any change that NHTSA decides to make will not have a material impact on automakers that are subject to EPA’s standards. For example, if NHTSA were to promulgate weaker standards than EPA, the stricter standards will be the ones that

determine automaker actions. And if NHTSA keeps their standards at the level of the augural standards set in 2012, then EPA's standards will end up being irrelevant. Both NHTSA and EPA have an obligation to consider the negative consequences of uncertainty caused by changes to the standard.⁵⁷

Also, NHTSA and EPA have generally harmonized their standards, so it is likely that industry would expect the agencies to harmonize the standards again even if EPA kept the standards the same without knowing what NHTSA will do.⁵⁸ Any uncertainty that might otherwise be caused by the fact that NHTSA has not begun the rulemaking process to finalize its standards for 2022–2025, would be lessened by the long-held expectation that NHTSA will coordinate with EPA. Therefore, EPA's Withdrawal will not promote certainty. If anything, the Withdrawal will create new regulatory uncertainty for a vital industry with long lead-times in production and development.

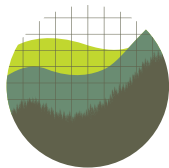
Conclusion

In issuing the 2017 Final Determination, EPA provided a rigorous assessment of all of the factors it now claims require further analysis. In the Withdrawal, EPA arbitrarily ignored that analysis.⁵⁹ In addition, EPA claims that new data undermines the conclusions in the 2017 Final Determination. But as this policy brief demonstrates, data and research on consumer purchases of vehicles and automaker compliance costs have not changed substantially since EPA issued its well-reasoned Final Determination in 2017. EPA has provided no economic evidence to support revising the 2022-2025 standards.

Endnotes

- ¹ Each automaker must meet an emissions standard based on the emissions from the fleet of vehicles that they sell. Each vehicle in the fleet has an emissions “target” based on the size of the vehicle and whether the vehicle is a car or a light truck. Larger vehicles and light trucks have more lenient targets. If an automaker cannot meet their standard, they can buy credits from other automakers who have more than met their standard in previous years.
- ² 77 Fed. Reg. 62,624 (Oct. 12, 2012). NHTSA set final standards for model years 2017 to 2021 and non-final “augural” standards for model years 2022 to 2025, meaning that those standards represented the agency’s “best estimate” of the appropriate level of stringency for those model years, based on the information available in 2012. 77 Fed. Reg. at 62,627.
- ³ 77 Fed. Reg. at 62,652, 63,161.
- ⁴ 76 Fed. Reg. 74,854, 74,861 (Dec. 1, 2011) (proposing mid-term evaluation); *see also* 77 Fed. Reg. at 62,652 (adopting proposal).
- ⁵ *See* EPA, FINAL DETERMINATION ON THE APPROPRIATENESS OF THE MODEL YEAR 2022-2025 LIGHT-DUTY VEHICLE GREENHOUSE GAS EMISSIONS STANDARDS UNDER THE MIDTERM EVALUATION (2017) [hereinafter 2017 Final Determination], *available at* <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100QQ91.pdf>; *see also* EPA, 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 (2016) [hereinafter Draft TAR 2016], *available at* <https://www.nhtsa.gov/staticfiles/rulemaking/pdf/cale/Draft-TAR-Final.pdf>.
- ⁶ 2017 Final Determination, *supra* note 5, at 30.
- ⁷ 83 Fed. Reg. 16,077, 16,078 (Apr. 13, 2018).
- ⁸ 77 Fed. Reg. at 62,671 (laying out the factors that the agency considers when assessing emissions standards: “EPA considers such issues as technology effectiveness, its cost (both per vehicle, per manufacturer, and per consumer), the lead time necessary to implement the technology, and based on this the feasibility and practicability of potential standards; the impacts of potential standards on emissions reductions of both GHGs and non-GHGs; the impacts of standards on oil conservation and energy security; the impacts of standards on fuel savings by consumers; the impacts of standards on the auto industry; other energy impacts; as well as other relevant factors such as impacts on safety”).
- ⁹ 83 Fed. Reg. at 16,078.
- ¹⁰ 83 Fed. Reg. at 16,084.
- ¹¹ 2017 Final Determination, *supra* note 5, at 8.
- ¹² *Id.* at 7.
- ¹³ *See* ENERGY INFO. ADMIN., ANNUAL ENERGY OUTLOOK 2011 WITH PROJECTIONS TO 2035 (2011), [https://www.eia.gov/outlooks/archive/aeo11/pdf/0383\(2011\).pdf](https://www.eia.gov/outlooks/archive/aeo11/pdf/0383(2011).pdf); ENERGY INFO. ADMIN., ANNUAL ENERGY OUTLOOK 2012 WITH PROJECTIONS TO 2035 (2012), [https://www.eia.gov/outlooks/archive/aeo12/pdf/0383\(2012\).pdf](https://www.eia.gov/outlooks/archive/aeo12/pdf/0383(2012).pdf); ENERGY INFO. ADMIN., ANNUAL ENERGY OUTLOOK 2016 WITH PROJECTIONS TO 2040 (2016), [https://www.eia.gov/outlooks/archive/aeo16/pdf/0383\(2016\).pdf](https://www.eia.gov/outlooks/archive/aeo16/pdf/0383(2016).pdf); ENERGY INFO. ADMIN., ANNUAL ENERGY OUTLOOK 2018 WITH PROJECTIONS TO 2050 (2018); <https://www.eia.gov/outlooks/aeo/pdf/AEO2018.pdf>.
- ¹⁴ ENERGY INFO. ADMIN., ANNUAL ENERGY OUTLOOK 2018 WITH PROJECTIONS TO 2050 (2018) at 113 shows that sales of cars and other high-efficiency automobiles are expected to increase relative to sales of other vehicles starting in 2020 as gas prices motivate consumers to adopt more fuel-efficient vehicles.
- ¹⁵ 83 Fed. Reg. at 16,084.
- ¹⁶ EPA, REGULATORY IMPACT ANALYSIS: FINAL RULEMAKING FOR 2017-2025 LIGHT-DUTY VEHICLE GREENHOUSE GAS EMISSION STANDARDS AND CORPORATE AVERAGE FUEL ECONOMY STANDARDS 10-1 (2012).
- ¹⁷ 77 Fed. Reg. at 62,655; *see also* Draft TAR 2016, *supra* note 5, at 3-1 (“[Fuel price] analyses were performed in 2012 and were based on then-available historical data, market forecasts from commercial sources, and projections based on the work published in the U.S. Energy Information Administration’s (EIA) Annual Energy Outlook 2011 (AEO 2011) and 2012 Early Release (AEO 2012ER) report.”). In its Withdrawal Figure 3, EPA uses the 2012 AEO forecast (rather than the 2012 Early Release) to illustrate changes in fuel prices between 2012 and the present. The 2012 Final Determination was not based on the 2012 AEO forecast, so it is unclear why the agency has now chosen to show that forecast.
- ¹⁸ ENERGY INFO. ADMIN., ANNUAL ENERGY OUTLOOK 2012 EARLY RELEASE, tbl.12A (2012), <https://www.eia.gov/outlooks/archive/aeo12/er/pdf/tbla12.pdf>.
- ¹⁹ EPA, REGULATORY IMPACT ANALYSIS: FINAL RULEMAKING FOR 2017-2025 LIGHT-DUTY VEHICLE GREENHOUSE GAS EMISSION STANDARDS AND CORPORATE AVERAGE FUEL ECONOMY STANDARDS 10-1 (2012).
- ²⁰ 83 Fed. Reg. at 16,079.
- ²¹ *Id.*
- ²² *Id.* at 16,080.
- ²³ This figure appeared as early as December 2017 in a Center for Automotive Research presentation. YEN CHEN, CTR. FOR AUTOMOTIVE RES., THE PARTY IS OVER- U.S. AUTOMOTIVE OUTLOOKS 18 (2017).

- ²⁴ CARLA BAILO ET AL., CTR. FOR AUTOMOTIVE RES., THE GREAT DIVIDE 9 (2018).
- ²⁵ Figure 1 shows that gas prices have been rising from a low at the beginning of 2016. By presenting electrified vehicle sales through only the beginning of 2016, EPA presents a biased picture of current demand for these vehicles.
- ²⁶ Jonathan M. Gitlin, *2017 was the best year ever for electric vehicle sales in the US*, ARSTECHNICA (Jan. 4, 2018), <https://arstechnica.com/cars/2018/01/2017-was-the-best-year-ever-for-electric-vehicle-sales-in-the-us/>.
- ²⁷ *Id.*
- ²⁸ Draft TAR 2016, *supra* note 5, at 12-22.
- ²⁹ ENERGY INFO ADMIN, *Light-Duty Vehicle Sales by Technology Type (thousands)*, United States, <https://www.eia.gov/open-data/qb.php?category=2642004> (last visited Apr. 26, 2018) (data found at “*Light-Duty Vehicle Sales: Alternative-Fuel Cars: 100 Mile Electric Vehicle*”, “*Light-Duty Vehicle Sales: Alternative-Fuel Cars: 200 Mile Electric Vehicle*”, and “*Light-Duty Vehicle Sales: Alternative-Fuel Cars: 300 Mile Electric Vehicle*”).
- ³⁰ Draft TAR 2016, *supra* note 5, at 11-6. The multiplier for fully electric vehicles ends in 2021, but the credits earned until that point will be available for use for five years after the year in which they were earned.
- ³¹ Draft TAR 2016, *supra* note 5, at 11-4.
- ³² (AEO 2016 high and low fuel price scenarios) . . . in all cases, the benefits (excluding fuel savings) and the fuel savings, each independently, exceed the costs.”).
- ³³ 83 Fed. Reg. at 16,083.
- ³⁴ *Id.* at 16,084.
- ³⁵ TYLER COMINGS & AVI ALLISON, SYNAPSE ENERGY ECONOMICS, INC., MORE MILEAGE FOR YOUR MONEY: FUEL ECONOMY INCREASES WHILE VEHICLE PRICES REMAIN STABLE 5 (2017).
- ³⁶ Draft TAR 2016, *supra* note 5, at 6-2.
- ³⁷ D.L. GREENE AND J.G. WELCH, THE HOWARD H. BAKER JR. CTR. FOR PUBLIC POL’Y, THE IMPACT OF INCREASED FUEL ECONOMY FOR LIGHT-DUTY VEHICLES ON THE DISTRIBUTION OF INCOME IN THE U.S.: A RETROSPECTIVE AND PROSPECTIVE ANALYSIS (2017), available at <http://bakercenter.utk.edu/wp-content/uploads/2017/03/WhitePaper2-2017.pdf>.
- ³⁸ *Id.* at 13.
- ³⁹ 83 Fed. Reg. at 16,079; EPA, MANUFACTURER PERFORMANCE REPORT FOR THE 2016 MODEL YEAR iv (2018) [hereinafter EPA (2018) Manufacturer Performance Report].
- ⁴⁰ 83 Fed. Reg. at 16,079.
- ⁴¹ EPA (2018) Manufacturer Performance Report, *supra* note 40, at iv (EPA reports that credits were only used starting in 2016, stating “Unlike the previous four years, in which generating credits was the norm, most large manufacturers (with sales greater than 150,000 vehicles) generated deficits in the 2016 model year.”).
- ⁴² Sam Ori, *One Reform EPA Should Make To Fuel Economy Rules That No One Is Talking About*, FORBES (Apr. 4, 2018), <https://www.forbes.com/sites/ucenergy/2018/04/04/one-reform-epa-should-make-to-fuel-economy-rules-that-no-one-is-talking-about/#7047234c5be8>.
- ⁴³ 83 Fed. Reg. at 16,079 (EPA cites comments from Global Automakers that “decline in vehicle sales, lower gas prices, an increased preference for light trucks over cars, and sluggish demand for high fuel economy vehicles—are taking place as the stringency of the standards increase at an unprecedented rate.”).
- ⁴⁴ Draft TAR 2016, *supra* note 5, at 12-7.
- ⁴⁵ Draft TAR 2016, *supra* note 5, at 1-7 (“Footprint is defined as a vehicle’s wheelbase multiplied by its average track width[]—in other words, the area enclosed by the points at which the wheels meet the ground.”).
- ⁴⁶ KEVIN BOLON, EPA, MIDTERM EVALUATION OF THE 2022-2025 LIGHT DUTY GHG STANDARDS REVIEW OF TECHNICAL ASSESSMENT AND ROLE OF OFF-CYCLE CREDITS 4 (Apr. 27, 2017).
- ⁴⁷ See 77 Fed. Reg. at 62,646.
- ⁴⁸ 83 Fed. Reg. at 16,086.
- ⁴⁹ NAT’L ACAD. OF SCI., COST, EFFECTIVENESS, AND DEPLOYMENT OF FUEL ECONOMY TECHNOLOGIES FOR LIGHT-DUTY VEHICLES 228 (2015), <http://nap.edu/21744>.
- ⁵⁰ *Id.* at 224.
- ⁵¹ *Id.* at 363-4.
- ⁵² *Id.* at 226.
- ⁵³ National Highway Traffic Safety Administration, Response to Petition for Reconsideration, 81 Fed. Reg. 95,489, 95,491 (Dec. 28, 2016).
- ⁵⁴ See 81 Fed. Reg. at 95,490 (“[B]ecause of industry design, development, and production cycles, vehicle designs . . . are often fixed years in advance.”).
- ⁵⁵ 2017 Final Determination, *supra* note 5, at 28, 30; see also 83 Fed. Reg. at 16,087.
- ⁵⁶ 83 Fed. Reg. at 16,087.
- ⁵⁷ 77 Fed. Reg. at 62,627.
- ⁵⁸ See U.S. GOV’T ACCOUNTABILITY OFF., NHTSA AND EPA’S PARTNERSHIP FOR SETTING FUEL ECONOMY AND GREENHOUSE GAS EMISSIONS STANDARDS IMPROVED ANALYSIS AND SHOULD BE MAINTAINED (2010), <https://www.gao.gov/assets/310/301194.pdf>.
- ⁵⁹ See *F.C.C. v. Fox Television Stations, Inc.*, 556 U.S. 502, 516 (2009) (requiring agencies to provide an explanation when the facts and circumstances underlying a new policy contradict the facts underlying a previous policy).



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Institute for Policy Integrity
New York University School of Law
Wilf Hall, 139 MacDougal Street, New York, New York 10012
policyintegrity.org