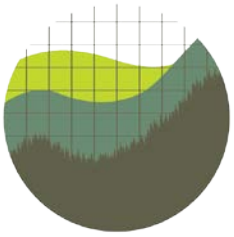

Institute *for*
Policy Integrity
NEW YORK UNIVERSITY SCHOOL OF LAW

December 21, 2018

VIA ELECTRONIC SUBMISSION

Attn: James Tamm, Office of Rulemaking, Fuel Economy Division, National Highway Traffic Safety Administration (NHTSA)

Re: The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks, NHTSA–2018–0067; FRL–9981–74–OAR; RIN 2127–AL76; RIN 2060–AU09

The Institute for Policy Integrity ("Policy Integrity") at New York University School of Law[1] previously submitted comments to the National Highway Traffic Safety Administration ("NHTSA") and the Environmental Protection Agency ("EPA") (collectively "the agencies") on the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021–2026 Passenger Cars and Light Trucks, 83 Fed. Reg. 42,986 (Aug. 24, 2018) ("Proposed Rule").[2]

These supplemental comments respond to certain comments and methodological issues in a report by NERA Economic Consulting and Trinity Consultants ("NERA/Trinity"), submitted as an attachment to the comments of the Alliance of Automobile Manufacturers ("Alliance") at the conclusion of the public comment period.[3]

The Alliance describes the NERA/Trinity analysis as "an independent directional verification of net benefits described in the Proposed Rule" and urges the agencies to "review the NERA econometric study's methodologies for adoption or to review their own models."[4] However, NERA/Trinity rely on proprietary models and data that have not been fully described or disclosed in the limited report attached to the Alliance's comments. The public, therefore, does not have the necessary information to meaningfully evaluate the details of the NERA/Trinity methodology, including the modeling, assumptions, and underlying data. The agencies may not rely on the NERA/Trinity analysis or any other new analysis as an analytical basis for a final rule without first making that information available and providing an opportunity for public comment.

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

[2] Comment by the Institute for Policy Integrity at New York University School of Law, NHTSA-2018-0067-12213 and EPA-HQ-OAR-2018-0283-5083 (Oct. 26, 2018) ("Policy Integrity Comments").

[3] *See* Comments of the Alliance of Automobile Manufacturers, NHTSA-2018-0067-12073 and EPA-HQ-OAR-2018-0283-6186 (Oct. 26, 2018) ("Alliance Comments"), attaching NERA Economic Consulting & Trinity Consultants, Evaluation of Alternative Passenger Car and Light Truck Corporate Average Fuel Economy (CAFE) Standards for Model Years 2021-2026 (Oct. 26, 2018) ("NERA/Trinity Analysis").

[4] Alliance Comments at 10.

Even with the limited information available, critical flaws in the NERA/Trinity analysis make it clear that the agencies cannot reasonably rely on that analysis or similar methodologies to justify the Proposed Rule. One such flaw is the way that NERA/Trinity have calculated the economic benefits of fuel savings attributable to the existing greenhouse gas standards and augural fuel economy standards (together "baseline standards"), which would be forgone by the Proposed Rule. NERA/Trinity's analysis includes only the value of fuel savings that it estimates consumers are willing to pay for when purchasing a vehicle.[5] This approach deviates significantly from the way that the agencies calculated the benefits of fuel savings in the Proposed Rule, which includes the total economic value of saved fuel (the quantity of fuel saved times the expected price of fuel).[6] As explained in Section A below, this approach to valuing the benefits of fuel savings contradicts economic theory and is irrational. Moreover, as explained in Section B below, this approach deviates from the long-standing practice, across agencies and administrations of both parties, for calculating the economic benefits of regulations that result in energy savings. Yet, neither the NERA/Trinity analysis, nor the Alliance comments to which it is attached explain or justify this approach.

As a result of their flawed methodology for accounting for fuel savings, the NERA/Trinity analysis significantly undervalues the benefits of the existing fuel economy and greenhouse gas emission standards, and understates the costs (in the form of forgone benefits) of rolling back those standards. The agencies should not adopt a methodology for valuing the economic benefits of fuel savings consistent with the approach taken by NERA/Trinity.

The NERA/Trinity analysis contains a number of additional flaws. NERA/Trinity employ a flawed scrappage model that appears to result in an increase in overall fleet size and vehicle miles traveled.[7] NERA/Trinity use unsupportable assumptions about the magnitude of the rebound effect.[8] And NERA/Trinity rely on the same VOLPE model that overstates the costs of the standards, including by holding all non-fuel economy attributes constant.[9] These flaws are more fully discussed in Policy Integrity's comments on the Proposed Rule and comments on the agencies' 2012 proposal to establish the baseline standards.

In addition, in order to predict the magnitude and composition of new vehicle sales, NERA/Trinity use an untested "nested logit" consumer choice model. But that model suffers from several flaws, many of which have caused the agencies to reject use of such models in the

[5] NERA/Trinity Analysis at 54.

[6] *See* Proposed Rule, 83 Fed. Reg. at 43,255.

[7] *See* Policy Integrity Comments at 59-91.

[8] *See id.* at 99-125.

[9] *See* Comments of Institute for Policy Integrity on 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards, 76 Fed. Reg. 74,854 (proposed Dec. 1, 2011) Docket Nos. EPA-HQ-OAR-2010-0799; NHTSA-2010-0131 at 15-19 (Feb. 13, 2012), https://policyintegrity.org/documents/Final_Comments_on_MY_2017-2025_GHG__CAFE.pdf; *see also* Antonio M. Bento et al., *Flawed Analyses of U.S. Auto Fuel Economy Standards* 362 SCIENCE 2, 4 (2018) ("[B]oth the 2016 TAR and 2018 NPRM have likely overestimated compliance costs. Neither analysis considers the full extent of options that manufacturers have available to respond to these policies, including changes in vehicle prices, performance, and *other attributes*") (emphasis added).

past.[10] The economics literature has found that consumer choice models, and particularly nested logit models, are ill-suited to predict consumer purchasing behavior because they fail to account for manufacturer decisions.[11] Moreover, the NERA/Trinity analysis calculates its willingness-to-pay measure, which it then incorrectly uses as proxy for the benefits of fuel saving, using the output of the nested-logit model while holding other performance attributes constant.[12] However, the same flaws that lead the nested logit model to be a poor predictor of vehicle purchasing decisions, as well as other econometric problems, make the NERA/Trinity willingness-to-pay measure a flawed predictor of actual consumers' willingness to pay for fuel economy.

A. The NERA/Trinity Approach to Valuing the Benefits of Fuel Savings Is Irrational

One of the primary benefits of energy efficiency standards is that they allow consumers to receive a given level of services at lower operating costs. In the case of automobile fuel economy, consumers receive a given level of transportation services while spending less on fuel. Under the baseline standards, consumers save money at the pump because each mile they choose to drive requires the purchase of less fuel and so costs them less. The economic benefits of these fuel savings can be calculated as the quantity of fuel saved multiplied by the economic value of the fuel.[13] However, when presenting the fuel saving benefits of the baseline standards, the NERA/Trinity analysis considers only the value of fuel economy improvements that it asserts consumers consider when making vehicle purchase decisions[14] That is, NERA/Trinity use a purported measure of consumers' willingness to pay for fuel economy improvements rather than the full economic value of fuel saved to calculate the social benefits of the baseline standards. But, leaving out a component of the economic value of fuel savings—the value that consumers do not consider when making a vehicle purchase decision—ignores the presence of market failures and so is not a rational measure of the social benefits of fuel savings.

As the economics literature has explored in detail, consumers often make up-front vehicle purchasing decisions that fail to fully account for future fuel savings.[15] Consumers value fuel economy but their perceived willingness to pay for fuel economy improvements often does not equal the net present expected savings in future fuel costs. That is, consumers may not be willing

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[10] *See* Proposed Rule, 83 Fed. Reg. at 43,076-078; EPA, Proposed Determination on the Appropriateness of the Model Year 2022-2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation at A-44 to A-48 (2016), https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100Q3DO.pdf).

[11] Gloria Helfand & Ann Wolverton, *Evaluating the Consumer Response to Fuel Economy: A Review of Literature*, 5 INT'L REV. OF ENVTL. AND RESOURCE ECON. 103, 112 (2011), https://www.nowpublishers.com/article/Details/IRERE-0040 ("Langer and Miller (2011) find that discrete choice models that do not consider the supply side result in inconsistent predictions of consumer demand response and that this problem is particularly acute for nested logit approaches.").

[12] NERA/Trinity Analysis at B-4 to B-5.

[13] For analyses of the total benefits fuel saving of a given regulatory action, the annual economic value of fuel savings should be converted to net present value.

[14] NERA/Trinity Analysis at 54.

[15] *See* David Greene et al., *Consumer Willingness to Pay for Vehicle Attributes: What Do We Know?*, 118 TRANSP. RES. 258 (2018), https://doi.org/10.1016/j.tra.2018.09.013 (meta-analysis of the academic literature regarding consumers' willingness to pay for fuel economy and other attributes).

to purchase a vehicle today that is $1 more expensive for a net present expected savings in future fuel costs of over $1. Instead consumers often are willing to purchase a vehicle that will receive $1 in net present expected fuel savings only when the up-front vehicle cost increase is less than $1. This is termed the "energy paradox" or "energy efficiency gap."[16] The economics literature has identified a number of market failures that contribute to the energy efficiency gap, including consumer myopia, consumer loss aversion, information asymmetries, supply-side market failures, and the positional nature of competing vehicle attributes.[17] Some of these market failures, like informational asymmetries and loss aversion, mean that consumers' willingness to pay for future fuel savings does not reflect what they would be willing to pay absent those market failures.[18] Other market failures, such as manufacturer market power or misjudging of consumer preferences, may lead to the undersupply of fuel efficient vehicle options, leaving consumers unable to actualize their willingness to pay for fuel economy improvements in the market.[19]

The presence of market failures means that modeled willingness-to-pay for fuel economy when purchasing a vehicle may not reflect the value consumers actually experience from fuel savings once they have purchased the vehicle. This gap between NERA/Trinity's measure of consumers' willingness to pay for fuel economy improvements and the fuel savings that consumers will actually receive creates the potential for a well-designed regulation to deliver net private benefits by correcting or compensating for market failures. Yet, those net private benefits provided to consumers are the very benefits that NERA/Trinity have, without explanation, excluded from their evaluation of the benefits of the standards.[20]

Due to market failures, *ex ante* measures of consumers' willingness to pay for fuel economy improvements are not the same as the *ex post* economic value of fuel savings actually realized. Those fuel savings result in consumer welfare improvements, even if consumers would not have paid for the fuel saving technology up-front, because consumers have more money to spend on other things.

The rational measure of the *societal* benefits of fuel savings is the full economic value of fuel saved. This is because, regardless of the value consumers appear to place on fuel savings when making vehicle purchase decisions, when they operate more efficient vehicles, they consume fewer real economic resources (e.g., barrels of oil, extraction cost, refining, transportation, etc.) than they would have had they operated less efficient vehicles. These real resource savings are

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[16] Helfand & Wolverton, *supra* note 11 at 105; International Energy Agency, Mind the Gap: Quantifying Principal-Agent Problems in Energy Efficiency 19-20 (2007), https://www.iea.org/publications/freepublications/publication/mind_the_gap.pdf.

[17] *See* Helfand & Wolverton, *supra* note 11 at 124-40 (reviewing the literature regarding justifications for the energy paradox). *See also* Policy Integrity Comments at 38-40 (explaining reasons for the fuel efficiency gap) *id.* at 47-51 (explaining one reason for the fuel efficiency gap, positional valuation, in detail); DAVID L. GREENE, CONSUMERS' WILLINGNESS TO PAY FOR FUEL ECONOMY AND IMPLICATIONS FOR SALES OF NEW VEHICLES AND SCRAPPAGE OF USED VEHICLES (2018), https://www.edf.org/sites/default/files/CARB_Report_Greene_UTenn_Consumer_Behavior_Modeling.pdf (explaining behavior economic explanations for the fuel efficiency paradox, including loss aversion).

[18] *See* Helfand & Wolverton, *supra* note 11 at 130-134.

[19] *Id.* at 112, 137-140.

[20] NERA/Trinity Analysis at 54, *id.* at H-2.

represented by the price of the fuel (i.e., gasoline or diesel) saved. As Office of Management and Budget Circular A-4—a guide for agencies on regulatory cost-benefit analysis issued under President George W. Bush and reaffirmed by the Trump Administration[21]—explains, the best measure of the economic value of the resources saved due to a regulation is the market price of those resources.[22] For commodities like gasoline and diesel that are subject to significant taxation, Circular A-4 explains that market prices should be adjusted to remove the value of those taxes, which represent a transfer rather than a real resource cost.[23] The economic value to society of the saved resources in a given year is then calculated as the quantity of fuel saved times the tax-adjusted price of the fuel. It is this value, rather than an estimation of consumers' willingness to pay for fuel efficiency technology, that should establish the forgone societal economic benefits of the fuel savings that will result from the Proposed Rule.

B. The NERA/Trinity Approach to Valuing the Benefits of Fuel Savings Is Inconsistent with the Longstanding Practice of Many Agencies Under Administrations of Both Political Parties

In line with executive guidance and economic theory, for the last forty years, the agencies have consistently recognized that it is appropriate to consider the full economic value of energy savings caused by regulation in the assessment of the benefits of that regulation. This approach to valuing the fuel saving benefits of energy efficiency regulation has been consistent under administrations of both political parties. The agencies' historic approach has also been consistent with the approach taken by other federal agencies that promulgate rules with substantial energy saving benefits. The following sections provide a series of examples demonstrating that both NHTSA and EPA have consistently used the full economic value of saved fuel when considering the costs and benefits of regulations that result in fuel savings. This is followed by examples

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[21] Office of Mgmt. & Budget, Circular A-4 at 19 (2003) ("Circular A-4"); *See* Office of Mgmt. & Budget, Guidance Implementing Executive Order 13771 (April 5, 2017) https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/memoranda/2017/M-17-21-OMB.pdf.

[22] Circular A-4 at 19 ("Market prices provide rich data for estimating benefits and costs based on willingness-to-pay if the goods and services affected by the regulation are traded in well-functioning competitive markets"); *id.* at 21 ("Economists ordinarily consider market prices as the most accurate measure of the marginal value of goods and services to society.")

[23] *Id.* at 21 ("The observed market price of gasoline may not reflect marginal social value due to the inclusion of taxes"); *see also* NHTSA, Final Regulatory Impact Analysis: Corporate Average Fuel Economy for MY 2017-MY 2025 Passenger Cars and Light Trucks 863-64 (2012), https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/fria_2017-2025.pdf ("NHTSA MY 2017-2025 FRIA") ("federal, state, and local taxes are excluded from the social value of fuel savings because these do not reflect costs of resources used in fuel production, and thus do not reflect resource savings that would result from reducing fuel consumption. Instead, fuel taxes simply represent resources that are transferred from purchasers of fuel to road and highway users, since fuel taxes primarily fund construction and maintenance of those facilities."). As OMB and NHTSA have explained, when taking a societal perspective, it is also appropriate to incorporate negative externalities into prices. Circular A-4 at 21; NHTSA MY 2017-2025 FRIA at 864. However, the agencies and NERA/Trinity have appropriately considered these externalities in a separate part of the cost benefit analysis. *See* Proposed Rule, 83 Fed. Reg. at 43,255 (listing pollution, energy security and pollution externalities as separate line-items in the cost benefit analysis); NERA/Trinity Analysis at S-10 to S-11.

from other agencies, demonstrating that the agencies' historic approach has been broadly consistent across the federal government.[24]

1. NHTSA Has Consistently Evaluated the Benefits of Fuel Economy Regulations Using the Full Economic Value of Fuel Savings

In its very first fuel economy regulation in 1977, NHTSA under President Jimmy Carter evaluated "the economic impact of [fuel economy] standards" for model year (MY) 1981-1984 passenger vehicles.[25] In conducting this evaluation, NHTSA compared the upfront increase in vehicle costs to consumer lifetime gasoline costs, and determined that "total consumer costs (that is, retail prices, maintenance costs, and gasoline costs" are anticipated to decrease by about $50 per car or $20 billion nationally."[26] In making this calculation, NHTSA explicitly rejected an approach that would have considered the benefits of fuel savings as consumers' willingness to pay for those savings, stating "since lifetime [fuel savings] benefits do actually accrue to the initial and subsequent owners, they are included in the analysis, regardless of their perception by individuals."[27] As a result, NTHSA included the full economic value of those savings, calculated as the expected quantity of fuel saved times the expected price of fuel.[28]

Later, under President Ronald Reagan, in a regulation that reduced the MY 1985 fuel economy standard for light duty trucks and established standards for MY 1986 trucks, NHTSA considered the expected economic impacts of its regulation using a similar approach.[29] NHTSA projected that vehicle price increases of $35 "would be offset by operating cost savings of $176 for the average 1986 light truck, due to reduced lifetime gasoline consumption."[30] Again, the Reagan Administration considered the full economic value of fuel savings rather than consumers' willingness to pay for fuel economy in the economic analysis that was used to inform its decision regarding the economic practicability of a given level of standards.[31]

Under the George H.W. Bush Administration, NHTSA issued two final rules to improve fuel economy for MY 1992 and MY 1993-1994 light trucks, respectively.[32] While the Final

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[24] Though this section discusses examples across agencies and parties it is not an exhaustive list of all regulations that improve energy efficiency.

[25] Passenger Automobile Average Fuel Economy Standards, 42 Fed. Reg. 33,534, 33,550 (June 30, 1977).

[26] *Id.* at 33,550-551.

[27] NHTSA, Final Impact Assessment of the Automotive Fuel Economy Standards for Model Year 1981-84 Passenger Cars at I-24 (June 30, 1977) ("An important issue which is often raised is that the new car buyer would be impacted more by costs than benefits as that person more readily perceives initial costs than benefits accruing over the life . . . of the vehicle. In our view all costs (and benefits of owning and operating a vehicle) incurred over the economic vehicle life . . . must be accounted for in the analysis, and not only those faced by any one owner such as the new car buyer.")

[28] *Id*.

[29] Light Truck Average Fuel Economy Standards Model Years 1985–86, 49 Fed. Reg. 41,250, 41,252 (Oct. 22, 1984).

[30] *Id.*

[31] NHTSA, Final Regulatory Impact Analysis for Model Years 1985-86 Light Truck Fuel Economy Standards at IV-22 (Sept. 1984) ("operating cost savings are defined as the present value of dollar savings in gasoline that the vehicle owner would realize over the life of the 1986 vehicles").

[32] Light Truck Average Fuel Economy Standards; Model Year 1992, 55 Fed. Reg. 12,487 (April 4, 1990); Light Truck Average Fuel Economy Standards; Model Years 1993-1994, 56 Fed. Reg. 13,779 (April 4, 1991).

Regulatory Impact Analysis documents are not publicly available for either of these rules, the agency's longstanding practice for valuing fuel savings suggests that the agency took the same approach in those rules. The agency should consult those Regulatory Impact Analyses.[33] In addition, in 1992, the agency proposed a rule to establish fuel economy standards for MY 1995-1997 light trucks.[34] That Preliminary Regulatory Impact Analysis is also not publicly available.[35] But when NHTSA later finalized that rule under the Clinton Administration, the Final Regulatory Impact Analysis makes clear that NHTSA considered the full economic value of fuel savings for that rule, not consumers' willingness to pay for those savings when purchasing a vehicle.[36]

In 1994, under the Clinton Administration, NHTSA issued a regulation establishing fuel economy standards for MY 1996-1997 light trucks.[37] In the economic analysis supporting that rulemaking, NHTSA evaluated the operating costs of trucks under different levels of fuel economy standards. NHTSA explained that "operating cost expenditures are defined as the present discounted value of dollar expenditures for gasoline that the vehicle owner would have to make over the life of a vehicle."[38] That is, for each fuel economy level, NHTSA evaluated the benefit of saving fuel using the full economic value of fuel savings, not the consumers' willingness to pay for that level of fuel economy .

Under the George W. Bush Administration, NHTSA again used the full economic value of saved fuel when evaluating the costs and benefits of fuel economy standards for MY 2008-2010 light trucks.[39] In fact, NHTSA again considered and rejected arguments to limit the benefits of fuel savings to the value that individual consumers ascribe to the savings when purchasing a vehicle.[40] NHTSA explained that it was appropriate to use the full economic value of fuel savings both because it was considering the "broader societal effect" of the standards and when taking the consumer perspective:

> The agency believes that CAFE standards should reflect the true economic value of resources that are saved when less fuel is produced and consumed . . . . Consumer's

[33] *See* NHTSA, Final Regulatory Impact Analysis: Average Fuel Economy Standard for Model Year 1992 Light Trucks (March 1990); Final Regulatory Impact Analysis: Average Fuel Economy Standard for Model Year 1993-1994 Light Trucks (Feb. 1991).

[34] Light Truck Average Fuel Economy Standards Model Years 1995-97, 57 Fed. Reg, 61,379 (proposed Dec. 24 1992).

[35] *See* Preliminary Regulatory Impact Analysis: Average Fuel Economy Standards for Model Years 1995-1997 Light Trucks (Dec. 1992).

[36] NHTSA, Final Regulatory Impact Analysis: Average Fuel Economy Standards for Model Year 1995 Light Trucks at VI-10, VI-14 (March 1993).

[37] Light Truck Average Fuel Economy Standards; Model Years 1996-1997, 59 Fed. Reg. 16,312 (April 6, 1994).

[38] NHTSA, Final Regulatory Evaluation: Average Fuel Economy Standards for Model Years 1996-1997 Light Trucks at VI-11 (Dec. 1993).

[39] *See* Average Fuel Economy Standards for Light Trucks Model Years 2008–2011; Final Rule, 71 Fed. Reg. 17566, 17631 (April 6, 2006) ("MY 2008-2011 Light Truck Standards"); *see also* Corporate Average Fuel Economy and CAFE Reform for MY 2008-2011 Light Trucks: Regulatory Impact Analysis at VIII-21 (March 2006), https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/2006_friapublic.pdf ("MY 2008-2011 Light Truck FRIA") (explaining the methodology for calculating the benefits of fuel savings).

[40] MY 2008-2011 Light Truck Standards, 71 Fed. Reg. at 17631; MY 2008-2011 Light Truck FRIA at VII-20.

> perceptions of these values may differ from their actual impacts, but they will nonetheless experience the full value of actual fuel savings just as they will pay the full increased cost when the vehicle is purchased."[41]

Contrary to the NERA/Trinity analysis,[42] in that rule NHTSA drew a distinction between its modeling of consumer behavior in the purchase of new vehicles (in which it applied estimates of consumer willingness-to-pay), and its societal benefits calculation (in which it used the full economic value of saved fuel).[43]

NHTSA adopted the same approach for the same reasons under the Obama Administration when it issued regulations establishing the baseline standards jointly with EPA. Together, the agencies calculated the benefits of the standards using the full economic value of fuel savings.[44] The agencies explained that fuel prices (multiplied by quantity of fuel saved) "determine[s] the value of fuel savings both to new vehicle buyers and to society."[45] From a consumer perspective, NHTSA stated that "the retail price of fuel is the proper measure for valuing fuel savings."[46] From the societal perspective, NHTSA specifically explained that the proper scope of analysis when calculating the fuel savings benefits in the context of a cost-benefit analysis is "the economic value of fuel savings to *the U.S. economy*,"[47] not consumers' willingness to pay for fuel economy:

> "When estimating the aggregate value to the U.S. economy of fuel savings resulting from alternative increases in CAFE standards—or the ''social'' value of fuel savings—the agency includes fuel savings over the *entire* expected lifetimes of vehicles that would be subject to higher standards, rather than over the shorter periods we assume manufacturers employ to represent the preferences of vehicle buyers, or that buyers are assumed to employ when assessing changes in the net price of purchasing and owning new vehicles. Valuing fuel savings over vehicles' entire lifetimes recognizes the savings in fuel costs that subsequent owners of vehicles will experience from higher fuel economy, even if their initial purchasers do not expect to recover the remaining value of fuel savings when they re-sell those

[41] MY 2008-2011 Light Truck Standards, 71 Fed. Reg. at 17631; *see also* MY 2008-2011 Light Truck FRIA at VII-20 to VII-21.

[42] NERA/Trinity Analysis at 54, B-4 (applying consumer willingness-to-pay to both the sales model and the analysis of societal benefits).

[43] MY 2008-2011 Light Truck FRIA at VII-21 ("The agency does restrict its analysis of sales impacts to a 4.5 year period under the assumption that initial buyer's purchase behavior will be influenced only by their perception of benefits they will receive while owning the vehicle, as opposed to benefits flowing to subsequent owners. However, the agency believes that the lifetime value of impacts from CAFE improvements should be fully reflected in its analysis of societal impacts that will determine CAFE standards.")

[44] 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards, 77 Fed. Reg. 62,624, 62,715 (Oct. 15, 2012) ("Baseline Standards Rule").

[45] EPA & NHTSA, Joint Technical Support Document: Final Rulemaking for 2017-2025 Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards at 4-7 (2012).

[46] NHTSA MY 2017-2025 FRIA at 863.

[47] *Id.* (emphasis in original).

vehicles, or for other reasons do not value fuel savings beyond the assumed five-year time horizon."[48]

2. EPA Has Consistently Evaluated the Benefits of Fuel Saving Caused by Vehicle Emission Regulations Using the Full Economic Value of Those Savings

In 1980, the Carter Administration EPA proposed a regulation to establish evaporative emission regulations for gasoline-fueled heavy-duty vehicles.[49] EPA projected that this regulation would cause heavy-duty gasoline-fueled vehicles to install closed-loop fuel metering systems that would have the ancillary benefit of improving vehicle fuel economy.[50] When calculating the costs and benefits of the standards, including the fuel economy improvements, EPA used the full economic value of saved gasoline and not a measure of consumers' willingness to pay for fuel economy.[51]

In 1987, the Reagan Administration EPA issued a proposed regulation to comprehensively control evaporative emissions from motor vehicles.[52] As part of that regulation, EPA considered fuel volatility regulations that, if adopted, would have improved the fuel economy of engines.[53] EPA evaluated the economic benefit of this change based on the expected volume of fuel saved multiplied by the expected price of fuel.[54] That is, EPA considered the full economic value of fuel savings and not consumers' willingness to pay for fuel economy.

In 1990, EPA under President George H.W. Bush proposed regulations to establish cold temperature carbon monoxide exhaust emission standards for light-duty vehicles.[55] EPA determined that compliance with the proposed standards would involve technology changes resulting in improved fuel economy.[56] When calculating the net cost of vehicles that comply with the standards, EPA used the full economic value of the expected fuel savings over the life of each vehicle, and not a measure of the benefits of fuel savings limited to consumer willingness-to-pay.[57]

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[48] Baseline Standards Rule, 77 Fed. Reg. at 62,992.

[49] Evaporative Emission Regulation and Test Procedure for Gasoline-Fueled Heavy-Duty Vehicles, 45 Fed. Reg. 28,922 (April 30, 1980).

[50] *Id.* at 28,924.

[51] *Id.*

[52] Regulation of Fuels and Fuel Additives: Volatility Regulations for Gasoline and Alcohol Blends Sold in 1989 and Later Calendar Years, 52 Fed. Reg. 31,274 (Aug. 19, 1987).

[53] EPA, Draft Regulatory Analysis: Control of Gasoline Volatility and Evaporative Hydrocarbon Emissions from New Motor Vehicles at 5-24 (July 1987), https://bit.ly/2Br7pkx.

[54] *Id.* at 5-60 to 5-61.

[55] Interim Regulations for Cold Temperature Carbon Monoxide Emissions From Light-Duty Vehicles and Light-Duty Trucks, 55 Fed. Reg. 38,250 (Sept. 17, 1990).

[56] *Id.* at 38,264.

[57] *Id.*

Similarly, in 2000, EPA under Bill Clinton promulgated regulations establishing "Tier 2" motor vehicle emission standards for both exhaust and evaporative emissions.[58] EPA analysis predicted that requirements of this rulemaking regarding On-board Refueling Vapor Recovery would lead to the adoption of technology that improves fuel economy.[59] When calculating the net cost of the standards, EPA used "the net present value of fuel savings over the life of the vehicle."[60] This reflects the full economic value of fuel saved rather than consumers' willingness to pay for the fuel economy improvements that would lead to such savings.

In a 2004 regulation establishing evaporative emissions from motorcycles, EPA under George W. Bush considered a technology that would reduce fuel leaks and, therefore, save fuel.[61] When evaluating the benefits of these fuel savings, EPA used the full economic value of the savings rather than a measure of consumers' willingness to pay for fuel savings.[62]

As explained above, under the Obama Administration, EPA considered the full economic value of fuel savings when calculating the benefits of its MY 2017 and later greenhouse gas emission standards issued jointly with NHTSA fuel economy standards.[63] EPA specifically rejected using a measure of consumers' willingness to pay for fuel economy, explaining that "regardless how consumers make their decisions on how much fuel economy to purchase, EPA expects that, in the aggregate, they will gain these fuel savings, which will provide actual money in consumers' pockets."[64]

3. The Department of Energy Has Used the Full Economic Value of Energy Savings When Calculating the Benefits of Appliance Efficiency Standards

The Department of Energy (DOE) has consistently used a similar approach for almost 40 years when promulgating regulations that set minimum energy efficiency standards for appliances and commercial and industrial equipment. Pursuant to the Energy Policy and Conservation Act (EPCA), as amended, DOE sets minimum standards for the energy efficiency of consumer appliances and commercial and industrial equipment.[65] Under EPCA, DOE is directed to establish standards that are "designed to achieve the maximum improvement in energy efficiency . . . which [DOE] determines is technologically feasible and economically justified."[66] In evaluating whether standards are economically justified, DOE is directed to weigh the benefits of

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[58] Control of Air Pollution From New Motor Vehicles: Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements; Final Rule, 65 Fed. Reg. 6698 (Feb. 10, 2000).

[59] Regulatory Impact Analysis - Control of Air Pollution from New Motor Vehicles: Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements at V-27 (1999), https://nepis.epa.gov/Exe/ZyPDF.cgi/P100F1UV.PDF?Dockey=P100F1UV.PDF.

[60] *Id.* at V-31 n. 9.

[61] Control of Emissions From Highway Motorcycles; Final Rule, 69 Fed. Reg. 2398, 2429 (Jan. 15, 2004).

[62] *Id. See also*, Final Regulatory Support Document: Control of Emissions from Highway Motorcycles at 5-5 (2003), https://nepis.epa.gov/Exe/ZyPDF.cgi/P100231W.PDF?Dockey=P100231W.PDF.

[63] Baseline Standards Rule, 77 Fed. Reg. at 62,715.

[64] 77 Fed. Reg. at 62,924.

[65] 42 U.S.C. § 6295.

[66] 42 U.S.C. § 6295(o)(2)(A) (emphasis added).

more efficient appliances, including energy savings, against the costs of the standards, including higher up-front purchase prices.[67]

The Carter Administration DOE issued the first proposed energy conservation standard for a variety of consumer appliances including refrigerators, freezers, clothes dryers, water heaters, room air conditioners, home heating equipment, kitchen ranges, central air conditioners, and furnaces.[68] This proposed rule established the key analytical considerations that DOE has used to establish energy conservation standards ever since. A critical component of this analysis involves calculating the benefits of the fuel—in the case of appliances, electricity, oil, or natural gas—that is saved due to the standards. DOE presented these benefits as part of two different calculations: (1) the benefits to consumers as represented by the difference in life-cycle cost (LCC)—that is, the sum of the purchase price and the operating expense, including maintenance expenditures, discounted over the lifetime of the appliance—between appliances subject to a standard and the baseline; and (2) the benefits to society, including, primarily, the net present value (NPV) of energy savings over the lifetime of the appliance.[69] These calculations were made using the full economic value of energy savings (and of up-front appliance costs), not a discounted measure based on consumers' willingness to pay for the standards.[70]

Under every administration since, DOE has finalized regulations regarding energy conservation standards that rely on a similar analytical framework to evaluate the economic justification for the standards. That is, DOE considers the full economic value of energy saved to both the consumer and the nation, rather than a measure of consumers' willingness to pay for the more efficient appliance or equipment. To list just a few examples:

- In 1982, the Reagan DOE issued a rule declining to set energy conservation standards for clothes dryers and kitchen ranges on the grounds that they would "not result in a significant conservation of energy and would not be economically justified."[71] In reaching the conclusion regarding economic justification, DOE conducted LCC and NPV analyses using the discounted value of energy saved multiplied by the expected price of electricity, oil, or natural gas (as appropriate for the specific appliance).[72]
- In 1991, the George H.W. Bush DOE issued a regulation establishing energy conservation standards for clothes washers, clothes dryers and dishwashers.[73] DOE

[67] *See id.* § 6295(o)(2)(B)(i) (enumerating factors for DOE to consider).

[68] Energy Conservation Program for Consumer Products; Proposed Rule, 45 Fed. Reg. 43,976 (June 30, 1980).

[69] *Id.* at 44,005-007.

[70] *Id.* at 44,005 n. 1.

[71] Energy Conservation Program for Consumer Products; Final Rule for Clothes Dryers and Kitchens Ranges and Ovens, 47 Fed. Reg. 57,198, 57,198 (Dec. 22, 1982).

[72] *Id.* at 57,202, 57,211, 57,212.

[73] Energy Conservation Program for Consumer Products: Final Rule Regarding Energy Conservation Standards for Three Types of Consumer Products, 56 Fed. Reg. 22,250 (May 14, 1991).

calculated the costs and benefits of those standards to include the net present value of energy savings to consumers and society.[74]

- In 1997, DOE under President Clinton issued the first of seven energy conservation standards. These standards for refrigerators and freezers were set at the level with the lowest life-cycle cost, due to the net present value of energy savings based on the quantity of energy saved and estimated electricity prices.[75]

- In 2002, DOE under President George W. Bush issued new more stringent energy conservation standards for central air conditioners and heat pumps.[76] DOE analyzed the economic effect of these standards based on the standard levels' life-cycle cost and the net present value, both of which included the benefits of energy savings calculated using the full economic value of those savings.[77] The Bush Administration promulgated four additional energy conservation standards, calculating the costs and benefits using the same approach.[78]

- The DOE under President Obama promulgated 40 energy conservation standards for consumer, commercial, and industrial appliances. These regulations all included similar analyses that calculated the benefits of energy savings based on the quantity of energy saved and the price of energy—that is, the full economic value of those savings.[79] The Trump Administration DOE has continued to use an identical methodology when

[74] *Id.* at 22,254.

[75] Energy Conservation Program for Consumer Products: Energy Conservation Standards for Refrigerators, Refrigerator-Freezers and Freezers, 62 Fed. Reg. 23,102, 23,109, 23,112 (April 28, 1997).

[76] Energy Conservation Program for Consumer Products; Central Air Conditioners and Heat Pumps Energy Conservation Standards, 67 Fed. Reg. 36,368 (May 23, 2002).

[77] *Id.* at 36,400, 36,401-402.

[78] 72 Fed. Reg. 58,190; 72 Fed. Reg. 65,136; 73 Fed. Reg. 58,772; 74 Fed. Reg. 1,092.

[79] *See, e.g.*, Energy Conservation Program: Energy Conservation Standards and Test Procedures for General Service Fluorescent Lamps and Incandescent Reflector Lamps, 74 Fed. Reg. 34,080, 34,098 (July 14, 2009) ("DOE calculated the sum of the purchase price and the operating expense—discounted over the lifetime of the equipment—to estimate the range in LCC benefits that consumers would expect to achieve due to standards. . . . Another tool calculates national energy savings and national NPV that would result from the adoption of energy conservation standards."); Energy Conservation Program: Energy Conservation Standards for Ceiling Fans, 82 Fed. Reg. 6,826, 6,828 (Jan. 19, 2017) ("The cumulative net present value (NPV) of total consumer costs and savings of the standards for ceiling fans ranges from $4.488 billion (at a 7-percent discount rate) to $12.123 billion (at a 3-percent discount rate). This NPV expresses the estimated total value of future operating-cost savings minus the estimated increased product costs for ceiling fans purchased in 2020-2049."); *See also* DOE, Technical Support Document: Energy Efficiency Program for Consumer Products and Commercial and Industrial Equipment: Ceiling Fans at 8-14 (2016), https://www.regulations.gov/document?D=EERE-2012-BT-STD-0045-0149 (detailing the calculation of LCC operating cost to be the net present value of seasonal energy consumption times seasonal electricity prices over the lifetime of the ceiling fan); *id.* at 10-8 (explaining that for the calculation of NPV, "DOE calculated annual [total operating cost] for ceiling fans by summing over the operating costs of all product

classes and sectors in the affected stock.").

considering the economic justification for consumer appliance and commercial and industrial equipment standards.[80]

4. Examples from Other Agencies

A number of other rulemakings have evaluated the economic benefits of energy savings using the full economic value of energy saved rather than a measure of consumers' willingness to pay for those savings.

- EPA issued regulations establishing new source performance standards to limit methane leaks from the oil and gas sector.[81] When calculating the benefits of these standards, EPA has included the full revenue from recovered natural gas.[82] This was the case even though EPA acknowledged that industry could have chosen to recapture the gas on its own but for various reasons has not—in other words, the economic value of natural gas savings exceeded the industry's willingness to pay for natural gas recovery. The Trump Administration EPA has taken a similar approach to valuing reduced natural gas leaks in its proposal to amend the standards, claiming that "from a social perspective . . . the increased financial returns from natural gas recovery accrues to entities somewhere along the natural gas supply chain and should be accounted for in the national impacts analysis."[83]

- The Bureau of Land Management took an approach that was similar to EPA when setting standards to limit methane leaks from the oil and gas sector on federal land.[84] The Bureau included as benefits the full economic value of any natural gas that would be recovered and sold due to the regulation.[85]

- In regulations establishing energy efficiency standards for new construction of certain government-assisted housing, the U.S. Department of Housing and Urban Development and U.S. Department of Agriculture calculated the benefits of more stringent standards

[80] *See e.g.*, Energy Conservation Program: Energy Conservation Standards for Walk-In Cooler and Freezer Refrigeration Systems, 82 Fed. Reg. 31,808, 31,843, 31,811 (July 10, 2017).

[81] Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources, 81 Fed. Reg. 35,824 (June 3, 2016).

[82] EPA, Regulatory Impact Analysis of the Final Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources at 3-14 to 3-15 (2016), https://www3.epa.gov/ttnecas1/docs/ria/oilgas_ria_nsps_final_2016-05.pdf.

[83] EPA, Regulatory Impact Analysis for the Proposed Reconsideration of the Oil and Natural Gas Sector Emission Standards for New, Reconstructed, and Modified Sources at 2-13 (2018), https://www.epa.gov/sites/production/files/2018-09/documents/oil_and_natural_gas_nsps_reconsideration_proposal_ria.pdf.

[84] Waste Prevention, Production Subject to Royalties, and Resource Conservation, 81 Fed. Reg. 83,069 (Nov. 18, 2016).

[85] Bureau of Land Management, Regulatory Impact Analysis for: Revisions to 43 CFR 3100 (Onshore Oil and Gas Leasing) and 43 CFR 3600 (Onshore Oil and Gas Operations at 107 (Nov. 10, 2016), https://www.regulations.gov/document?D=BLM-2016-0001-9127.

using the full economic value of energy saved.[86] The agencies justified these standards based on the energy efficiency gap.[87]

We have not found any examples where an agency has calculated the benefits of fuel or energy savings using the consumers' willingness to pay for those savings upfront.

C. Conclusion

The agencies' approach in the Proposed Rule is to consider the full economic value of avoided fuel consumption enabled by more stringent fuel economy standards when calculating the social benefits of the regulation, and the forgone benefits of the proposed rollback.[88] This approach is consistent with economic theory and scholarship, executive branch guidance, and decades of regulatory practice by numerous agencies across administrations of both parties. The agencies should retain this approach rather than adopting the flawed approach to valuing the benefits of fuel saving included in the NERA/Trinity Analysis.

Respectfully,

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[86] Final Affordability Determination—Energy Efficiency Standards, 80 Fed. Reg. 25,901, 25,921 (May 6, 2015).

[87] *Id.* at 25,910.

[88] *See* Proposed Rule, 83 Fed. Reg. at 43,255.