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National Highway Traffic Safety Admin.
United States Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590
Dkt. ID No. NHTSA-2021-0054

RE: Supplemental Environmental Impact Statement for MYs 2024 – 2026: Comments of Sierra Club, Environmental Defense Fund, and Center for Biological Diversity

The Sierra Club, Environmental Defense Fund, and Center for Biological Diversity respectfully submit these comments regarding the National Highway Traffic Safety Administration's (NHTSA's) Draft Supplemental Environmental Impact Statement (DSEIS) for model years 2024-2026. The organizations appreciate NHTSA's efforts in the DSEIS to address issues identified in the prior comments Sierra Club and Center for Biological Diversity jointly filed regarding the draft environmental impact statement for the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Year 2021-2026 Passenger Cars and Light Trucks.[1] The organizations urge NHTSA to take additional steps to address the issues identified below before finalizing its Supplemental Environmental Impact Statement for Model Years 2024-2026.

I. NHTSA's DSEIS Understates the Relative Emission Benefits of Battery Electric Vehicles

NHTSA's DSEIS presents an erroneous picture of the GHG emissions impacts of battery electric vehicles (EVs). NHTSA's discussion of EV GHG emissions in its life-cycle assessment is plagued by reliance on stale data.[2] When more current data are used, the results are dramatically different and show that EVs are already superior to internal combustion engine (ICE) vehicles from a GHG emissions perspective across almost the entire country, and trends in power generation will cause EVs to further outpace ICE vehicles on emission reductions in the coming years.

NHTSA presents an assessment of the probability that the sources of electricity powering a battery electric vehicle emit carbon dioxide at a lower rate than a hybrid or internal combustion engine vehicle, DSEIS at 6-26, Fig. 6-2.3-10, and looks at how this probability is influenced by

[1] *See* Joint Comments of Center for Biological Diversity, Earthjustice, Environmental Law and Policy Center, Natural Resources Defense Council, Public Citizen, Inc., Safe Climate Campaign, Sierra Club, Southern Environmental Law Center, and Union of Concerned Scientists Re: The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Year 2021-2026 Passenger Cars and Light Trucks: Draft Environmental Impact Statement, Docket ID No. NHTSA-2017-0069 (Oct. 26, 2018), attached as Exhibit 1.

[2] NHTSA acknowledged but did not address this limitation in the DSEIS. DSEIS at 6-16 ("The U.S. grid mix has changed significantly over the past decade, and this means that older LCAs based on different grid mix assumptions might not be comparable with findings in Chapters 4 and 5, which are based on more recent grid mix forecasts.").

use of consumption-based versus generation-based emissions accounting and the timing of EV charging. NHTSA's assessment suggests that in many parts of the country, the sources of electricity powering BEVs are unlikely to emit carbon dioxide (CO_2) at a lower rate than a hybrid or ICE vehicle. This is erroneous and must be corrected in the final SEIS.

NHTSA's assessment relies on data that are far out of date and radically different from more current CO_2 emission data from the power grid. NHTSA's Figure 6.2.3-10 is based on a paper by Tamayao et al. published six years ago in 2015.[3] The data sources used by Tamayao et al. are even further out of date.[4] Tamayao et al. relied on information from EPA's eGRID 2012 for their subregional annual CO_2 emission rates, which relied on marginal grid emission data from 2009[5]—12 years ago. In 2009, coal—the most CO_2-intense source of power generation—accounted for 44 percent of utility-scale power generation in the United States.[6] By 2019, that percentage had dropped to less than 24 percent.[7] At the same time, the share of zero marginal CO_2 emitting utility-scale power generation (hydro, wind, solar, nuclear) increased from just over 30 percent in 2009 to more than 37 percent in 2019, with significant additional solar generation coming from small scale generation.[8] The increase in zero emitting utility-scale generation is driven almost entirely by additional renewable resources (solar and wind).[9]

Table 1 below illustrates the change in CO_2 emission rate between eGRID 2012—the data set relied upon by NHTSA in its DSEIS—and eGRID 2019,[10] for the different eGRID subregions in the continental United States. As the table shows, all eGRID subregions experienced a decline in annual CO_2 emission rate during this time, with 16 of the 22 eGRID subregions experiencing a decline of at least 20 percent, 8 experiencing a decline of at least 30 percent, and one experiencing a decline of more than 50 percent.

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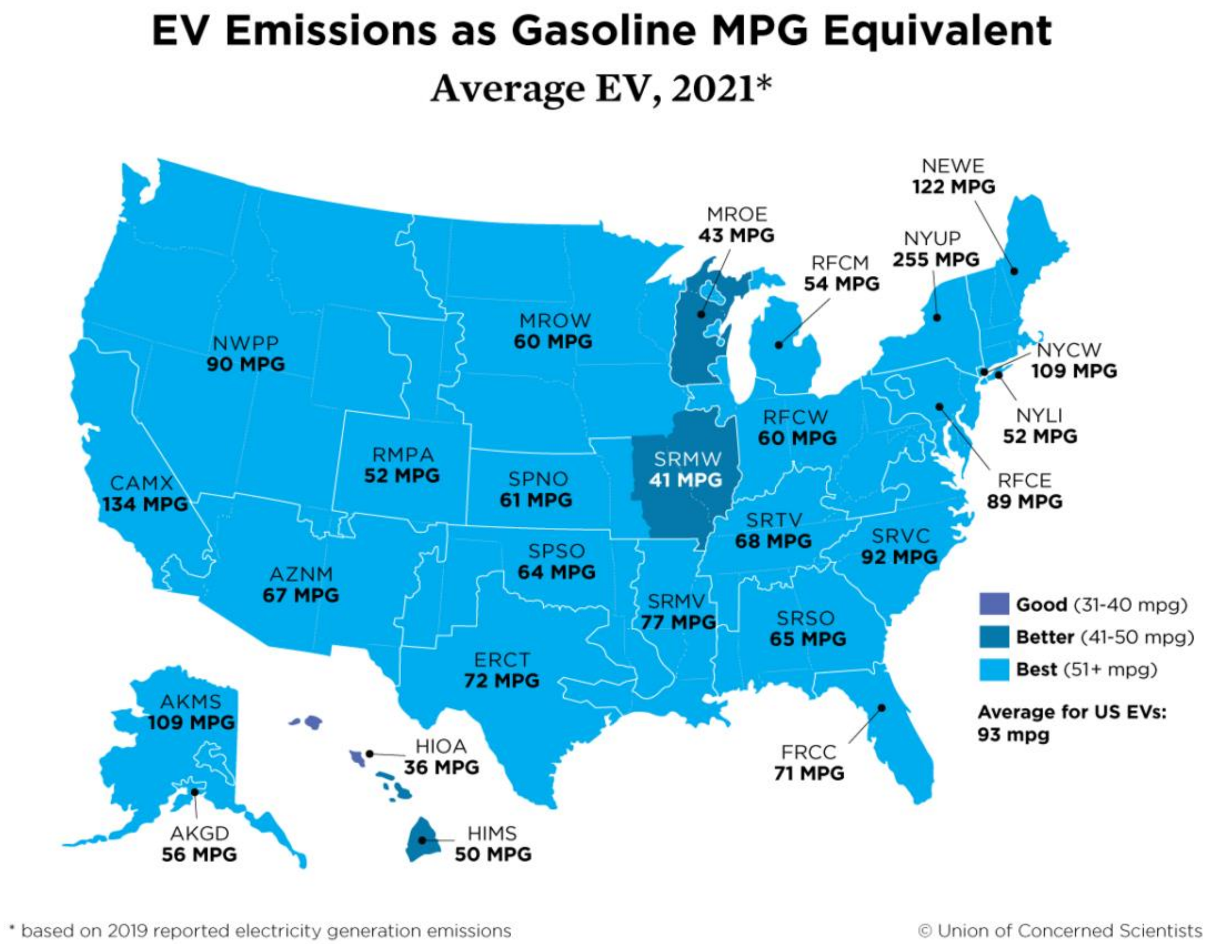
[3] Tamayao, M.A.M., et al. 2015. Regional variability and uncertainty of electric vehicle life cycle CO_2 emissions across the United States. Environmental Science & Technology 49(14):8844-8855. doi:10.1021/acs.est.5b00815.
[4] *See* Tamayao, M.A.M. et al, Supplemental Information for Regional variability and uncertainty of electric vehicle life cycle CO_2 emissions across the United States, attached as Exhibit 2.
[5] *Id.* at 5.
[6] EIA, Table 3.1.A. Net Generation by Energy Source: Total (All Sectors), 2009 – 2019, available at https://www.eia.gov/electricity/annual/html/epa_03_01_a.html. (coal accounted for 1.755 billion MWh out of 3.950 billion MWh of total generation at utility-scale facilities in 2009).
[7] EIA, Table 3.1.A. Net Generation by Energy Source: Total (All Sectors), 2009 – 2019 (coal accounted for 964 million MWh out of 4.126 billion MWh of total generation at utility-scale facilities in 2019).
[8] EIA, Table 3.1.A. Net Generation by Energy Source: Total (All Sectors), 2009 – 2019 (utility scale nuclear + hydroelectric convention + solar + renewable sources excluding hydroelectric and solar accounted for 1.217 billion MWh in 2009 and 1.537 billion MWh in 2019).
[9] EIA, Table 3.1.A. Net Generation by Energy Source: Total (All Sectors), 2009 – 2019) (utility-scale solar increased by a factor of 9 from 819,000 MWh in 2009 to 71.9 million MWh in 2019, and other non-solar, non-hydro renewables more than doubled from 143 million MWh in 2009 to 367 million MWh in 2019).
[10] U.S. EPA, eGRID Data Explorer, available at https://www.epa.gov/egrid/data-explorer.

Table 1: Change in Annual CO_2 Emission Rate from eGRID 2012 to eGRID 2019

eGRID subregion acronym	eGRID subregion name	eGRID 2012 subregion annual CO_2 emission rate (lb/MWh)	eGRID 2019 subregion annual CO_2 emission rate (lb/MWh)	Percent Reduction (%)
FRCC	FRCC All	1175	861	26.7
MORE	MRO East	1588	1503	5.4
MROW	MRO West	1626	1098	32.5
NYLI	NPCC Long Island	1344	1209	10.1
NEWE	NPCC New England	726	489	32.7
NYCW	NPCC NYC/Westchester	609	554	9.1
NYUP	NPCC Upstate NY	497	232	53.3
RFCE	RFC East	946	695	26.5
RFCM	RFC Michigan	1657	1189	28.2
RFCW	RFC West	1518	1068	29.6
SRMW	SERC Midwest	1747	1584	9.3
SRMV	SERC Mississippi Valley	1001	807	19.4
SRSO	SERC South	1322	1002	24.2
SRTV	SERC Tennessee Valley	1355	950	29.9
SRVC	SERC Virginia/Carolina	1034	675	34.7
SPNO	SPP North	1813	1070	41.0
SPSO	SPP South	1595	1002	37.2
ERCT	ERCOT All	1179	869	26.3
CAMX	WECC California	658	453	31.1
NWPP	WECC Northwest	818	715	12.6
RMPA	WECC Rockies	1822	1243	31.8
AZNM	WECC Southwest	1188	952	19.8

When NHTSA's Figure 6.2.3-10 is updated with more current data, the picture looks very different. The Union of Concerned Scientists calculated EV mile-per-gallon equivalence—the combined city/highway fuel economy rating of a gasoline vehicle would have global warming emissions equivalent to driving an EV—for all eGRID subregions using eGRID 2019 data.[11] As the updated map (below) shows, in only two eGRID subregions in the continental US do EVs have a GHG mpg equivalence below 50 mpg. In 17 of the 22 eGRID subregions in the Lower 48 States, EVs have a GHG mpg equivalence of 60 mpg or higher.

[11] Reichmuth, D., Plug In or Gas Up? Why Driving on Electricity is Better than Gasoline (June 7, 201), available at https://blog.ucsusa.org/dave-reichmuth/plug-in-or-gas-up-why-driving-on-electricity-is-better-than-gasoline/. UCS notes that the comparison includes gasoline and electricity fuel production emissions estimates for processes like extraction, transportation, and refining using Argonne National Laboratory's GREET 2020 model and that the 93 mpg US average is a sales-weighted average based on where EVs were sold in 2011 through 2020. *Id.*



NHTSA also presents marginal emission factors (MEFs) in Figure 6.2.3-13 to assess the emissions impact of EVs. The data underpinning these MEFs are also stale. These data were drawn from Siler-Evans et al. (2012), which analyzed data from 2007 to 2009,[12] and from Graff Zivin et al. (2014), which analyzed data from 2006 to 2011.[13] As discussed above, the composition of the grid has changed dramatically in the past 10 years and marginal emission data from 10 to 15 years ago are no longer representative. In addition, the Siler-Evans et al. data are further skewed because the authors assumed fossil fuel generation to be on the margin at all times and looked only at the marginal emission rate of fossil fuel generators.[14] Finally, particularly in light of the growth of energy storage, which can result in a temporal displacement of generation, it is not clear that MEFs are the appropriate tool for analyzing EV emissions equivalence. Not only can storage effectively shift what generation is on the margin, EV load can

[12] Siler-Evans, K. et al., Marginal Emissions Factors for the U.S. Electricity System, Envtl. Sci. & Tech. (2012), dx.doi.org/10.1021/es300145v.

[13] Graff Zivin, J.S., et al., Spatial and temporal heterogeneity of marginal emissions: Implications for electric cars and other electricity-shifting policies, J. Econ. Behavior & Org. (2014), http://dx.doi.org/10.1016/j.jebo.2014.03.010.

[14] *See* Zivin et al. (2014) (explaining limitations of Siler-Evans et al. including reliance on the assumption that only fossil fuel power plants in EPA's continuous emissions monitoring system data supply marginal electricity output).

also be actively managed, as utilities are already beginning to do.[15] With active third-party managed charging, it is possible to time vehicle charging for optimization based on a variety of metrics including, for example, the GHG-intensity of the power grid, to minimize emissions impacts from new EV electric load.

NHTSA's relative emissions analysis is also problematic because it is static, depicting a snapshot in time (indeed, a very out-of-date one, as explained above). But the GHG emissions intensity of the electric grid continues to decline in response to economic and regulatory factors. According to the Energy Information Administration, "[a]s of September 2020, 38 states and the District of Columbia had established [a Renewable Portfolio Standard] or renewable goal, and in 12 of those states (and the District of Columbia), the requirement is for 100% clean electricity by 2050 or earlier."[16] NHTSA itself notes that "EIA projects that electricity generation in the United States will increase steadily through 2050, with large gains in solar and wind generating capacity, and decreases in coal-fired generation facilities," and appropriately recognizes that "[w]hen considered with the projected cleaner U.S. grid mix, this life-cycle GHG benefit will grow in future years." DSEIS at 6-16. NHTSA must correct the patent errors in the emissions comparison for EVs and ICE vehicles for its life-cycle analysis in its final SEIS.

II. NHTSA's DSEIS Understates the Adverse Environmental Impacts of ICE Vehicles by Omitting Consideration of the Impacts of Transporting Oil and of Oil Spills

NHTSA should correct its omission of the environmental impacts of transporting oil in its final SEIS. In Chapter 6 of the DSEIS, NHTSA explains that a life-cycle analysis looks at five phases: (1) raw material extraction; (2) manufacturing; (3) vehicle use; (4) end of life management; and (5) transportation (i.e., how materials and product are moved between these phases). DSEIS at 6-2. Yet, NHTSA's actual life-cycle analysis for EVs and ICE vehicles presented in the DSEIS fails to address the transportation phase. This omission is significant because transport of crude oil—the feedstock for the fuel for ICE vehicles—over the past decade has been responsible for numerous spills, fires, and explosions causing massive damage to natural environments and wildlife, and incurring billions of dollars in cleanup costs. In its final SEIS, NHTSA must consider and discuss the impacts of transporting materials, including crude oil, between the phases of the life-cycle analysis.

Crude oil can be transported in several ways including via pipelines, by ship, and by rail. Each mode of transport can result in spills and serious damage to the environment. According to data from the Pipeline and Hazardous Materials Safety Administration (PHMSA), between 2001 and 2020, there were 1,158 significant pipeline system incidents involving crude oil resulting in 725,755 barrels spilled and more than $3 billion in costs.[17] Oil spills can cause a wide array of deleterious effects—both direct and indirect—on wildlife and wildlife habitat[18] including

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[15] *See, e.g.*, National Grid, Niagara Mohawk Power Corporation d/b/a National Grid Residential Electric Vehicle (EV) Managed Charging Proposal, N.Y. P.S.C. Case No. 18-E-0138 (June 4, 2020), attached as Exhibit 3.

[16] EIA, Renewable Energy Explained: Portfolio Standards, https://www.eia.gov/energyexplained/renewable-sources/portfolio-standards.php.

[17] U.S. DOT, PHMSA, Pipeline Incident 20 Year Trends: Significant Incident 20 Year Trend, available from https://www.phmsa.dot.gov/data-and-statistics/pipeline/pipeline-incident-20-year-trends

[18] Heron, S.F., How Does an Oil Spill Affect the Environment? Sciencing (Nov. 22, 2019), https://sciencing.com/oil-spill-affect-environment-4616883.html.

trapping animals, destroying the insulating ability of mammal fur and the water repellency of bird feathers, increasing the risk of hypothermia, impacts to lungs, immune function and reproduction due to inhalation.[19] As NHTSA acknowledges, "increases in fuel use resulting from reduced fuel costs or lower fleet-wide fuel economy could result in the need for additional oil extraction and refining, along with a potential need for new pipelines." DSEIS at 8-10. As the PHMSA pipeline data cited above show, spills are an inherent danger associated with the transport of oil via pipelines and must be considered and addressed in the final DSEIS.

Transport of crude oil in railcars raises additional environmental concerns that must be evaluated in the final SEIS. Although the volume of transport of crude oil by rail has declined in recent years from its peak in the mid-2010's, a large amount of crude oil in North America is still transported via railcar. According to data from the Department of Transportation, in 2018 there were still nearly 13,000 rail tank cars transporting crude oil (down from a high of more than 35,000 in 2014).[20] Crude oil transport via rail has resulted in a number of catastrophic spills and fires including the destructive blaze at Lac-Mégantic, and the major derailments in Aliceville, Alabama, and Casselton, North Dakota.[21] The Province of Québec sought C$400 million in reimbursement of the clean-up costs associated with the Lac-Mégantic derailment and explosion.[22] In 2013 alone, over 1.1 million gallons of crude oil spilled in the United States, more than the total amount spilled between 1975 and 2012.[23] Despite the ongoing transport of crude oil by rail, the DSEIS includes no reference to or discussion of rail transport. NHTSA must correct this in the final SEIS.

Finally, transport of oil sands crude—whether by pipeline or rail—raises still other environmental concerns not addressed in the DSEIS. Although current oil prices have suppressed extraction of oil sands oil for the moment, as NHTSA recognizes, there is "uncertainty in the long-term growth of oil sands production." DSEIS at 6-7. Oil sands crudes are distinct from other forms of crude oil due to the unique chemical composition of the bitumen itself and the presence of large quantities of volatile diluent containing high levels of VOCs, toxic air contaminants and hazardous air pollutants. U.S. Geological Survey reports that "natural bitumen," the source of oil sands-derived oils, contains 102 times more copper, 21 times more vanadium, 11 times more sulfur, six times more nitrogen, 11 times more nickel, and 5 times

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[19] NOAA, How does oil impact marine life? https://oceanservice.noaa.gov/facts/oilimpacts.html.

[20] U.S. Dept. of Transp. Bureau of Transp. Stats., Fleet Composition of Rail Tank Cars Carrying Flammable Liquids: 2019 Report, at 6, Fig. 2.

[21] *See* Comments of the Natural Resources Defense Council, Sierra Club and Oil Change International on behalf of Earthjustice, ForestEthics, Public Citizen, Friends of the Earth, Spokane Riverkeeper, Columbia Riverkeeper, Puget Soundkeeper Alliance, Friends of Grays Harbor, Natural Resources Council of Maine, Benicia Good Neighbor Steering Committee, Community In-power and Development Association, Vermont Chapter of the Sierra Club, Audubon Society of New Hampshire regarding Advance Notice of Proposed Rulemaking: Hazardous Materials: Rail Petitions and Recommendations to Improve the Safety of Railroad Tank Car Transportation, PHMSA-2012-0082 (HM-251) (Dec. 5, 2013), at 8-10, attached as Exhibit 4; Petition to the Secretary of Transportation to Issue an Emergency Order Prohibiting the Shipment of Bakken Crude Oil in Unsafe Tank Cars Submitted by Earthjustice on behalf of Sierra Club and ForestEthics (July 15, 2014), at 3, attached as Exhibit 5.

[22] Allan Woods, Quebec submits $400 million claim for Lac-Mégantic train disaster, Toronto Star (June 16, 2014), https://www.thestar.com/news/canada/2014/06/16/quebec_claims_400_million_for_lacmgantic_train_disaster.html.

[23] Curtis Tate, More Oil Spilled from Trains in 2013 than in Previous 4 Decades, Federal Data Show, McClatchy DC (Jan. 20, 2014), available at.

more lead than conventional oil.[24] Oil stands crudes contain large amounts of neurotoxic and carcinogenic[25] volatile organic compounds benzene, toluene, ethyl-benzene, and xylenes (BTEX) and other heavy metals such as lead.[26] When blended with diluents, oil sands "DilBit" crudes contain even higher concentrations of BTEX compounds, which have a high potential to be released by way of transport as well as process related emissions.[27]

In addition, oil sands crudes are highly corrosive. The Total Acid Number (TAN) is a measure of high organic acid content, typically naphthenic acids. These acids are known to cause corrosion at high temperatures. Crude oils with a TAN number greater than 0.5 mgKOH/g33 are considered to be potentially corrosive and indicates a level of concern. A TAN number greater than 1.0 mgKOH/g is considered to be very high. Canadian oil sands crudes are high TAN crudes. The DilBits, for example, range from 0.98 to 2.42 mgKOH/g.[28] Due to its corrosivity, oil sands crudes create a greater risk for spills during transport.

Spills involving DilBit can be environmentally catastrophic. As EPA explained in commenting on the proposed Keystone XL pipeline project in 2013, three years after a major spill of DilBit in the Kalamazoo River in Michigan, heavy oil remained at the bottom of the river and cleanup costs exceeded $1 billion in public funds.[29] NHTSA must consider the impacts of its proposals on future use and transport-related environmental impacts of oil sands oil in the final SEIS.

III. NHTSA DSEIS Overstates the Small and Ephemeral Near-Term Adverse Health Impacts of the Proposal

The DSEIS's air quality and human health impacts analyses are distorted by NHTSA's unreasonably high assumption about the additional driving that will occur as fuel economy improvement lowers the cost of driving (the rebound effect). One notable result is that, based on the erroneous rebound effect, NHTSA projects adverse health impacts in 2025.[30] As discussed in the Appendix to Joint Summary Comments of Environmental, Advocacy, and Science Organizations on NHTSA's Notice of Proposed Rulemaking: Corporate Average Fuel Economy Standards for Model Years 2024–2026 Passenger Cars and Light Trucks, 86 Fed. Reg. 49,602 (Sept. 3, 2021), which are being filed in Docket ID No. NHTSA-2021-0053 and are hereby incorporated by reference, NHTSA's use of a 15 percent rebound effect is unreasonably high and unsupported by the evidence. NHTSA has provided a thorough justification for a 10 percent (or

[24] Meyer, R.F., et al., Heavy Oil and Natural Bitumen Resources in Geological Basins of the World, U.S. Geological Survey Open-File Report 2007-1084 (2007), at 14, Tbl. 1, Available at http://pubs.usgs.gov/of/2007/1084/OF2007-1084v1.pdf.
[25] U.S. Dept. of Health & Human Servs., Interaction Profiles for: Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) (May 2004), available at https://www.atsdr.cdc.gov/interactionprofiles/ip-btex/ip05.pdf.
[26] Fox, P., Ph.D., PE, Comments on Environmental Impact Report for the Phillips 66 Rail Spur Expansion Project, Santa Maria, California (Jan. 27, 2014), at 24, attached as Exhibit 6.
[27] *Id.*
[28] *Id.* at 21 (citing www.crudemonitor.ca).
[29] EPA, Comment Letter to US Department of State Regarding the Supplemental Draft Environmental Impact Statement from TransCanada's Proposed Keystone XL project (2013), available at http://www.epa.gov/Compliance/nepa/keystone-xl-project-epa-comment-letter-20130056.pdf
[30] DSEIS at S-9.

lower) rebound effect in several prior rulemakings and lacks any basis to rely on a larger rebound effect in this rulemaking. Indeed, 10 percent is at the *maximum* end of appropriate rebound values, and the true fuel economy rebound effect is likely much lower and may even be zero.

The health impacts summary on page S-9 of the DSEIS also leaves a confusing and false impression about the certainty of adverse health impacts. NHTSA appropriately notes in its "key findings" summary of air quality impacts, "[i]t is important to stress that…if NHTSA has overestimated the rebound effect, then emissions would be lower...,"[31] and helpfully frames its results in the criteria pollutants summary as "quite small" increases that "could be affected by the assumptions in the model."[32] The health impacts summary, however, does not contain this important context. Commenters suggest NHTSA add additional clarification about the uncertainties and assumptions in the 2025 summary on page S-9.

Thank you for your consideration.

Respectfully submitted,

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[31] *Id.* at S-8.
[32] *Id.*