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October 16, 2023

Ann Carlson, Acting Administrator
National Highway Traffic Safety Administration
U.S. Department of Transportation
West Building, Ground Floor, Rm. W12–140
1200 New Jersey Avenue SE
Washington, DC 20590

**Attention: Docket ID No. NHTSA–2023–0022**
*Submitted to the Federal eRulemaking Portal (www.regulations.gov)*

**Re: Corporate Average Fuel Economy Standards for Passenger Cars and Light Trucks for Model Years 2027–2032 and Fuel Efficiency Standards for Heavy-Duty Pickup Trucks and Vans for Model Years 2030–2035; 88 Fed. Reg. 56,128 (August 17, 2023) NHTSA–2023–0022**

Dear Acting Administrator Carlson:

The American Fuel & Petrochemical Manufacturers (AFPM) submits these comments in response to the National Highway Traffic Safety Administration's (NHTSA's or Agency's) proposed rule, Corporate Average Fuel Economy Standards for Passenger Cars and Light Trucks for Model Years 2027–2032 and Fuel Efficiency Standards for Heavy-Duty Pickup Trucks and Vans for Model Years 2030–2035 (hereinafter "Proposal" or "Proposed Rule").[1] AFPM represents the U.S. refining and petrochemical industries, and, as such, has a strong interest in this rulemaking.

AFPM shares NTHSA's goal of improving the efficiency of our nation's transportation fleet. Indeed, our members are investing heavily in technologies and processes that continue to reduce the carbon intensity of fuels and have long worked with automakers to improve the fuel efficiency of internal combustion engines. Importantly, investments in reducing the carbon intensity of fuel can reduce the lifecycle carbon intensity of new and existing vehicles, offering the potential to achieve faster emission reductions at a lower overall cost to society.

AFPM is committed to the development of policies that reduce greenhouse gas emissions and improve the fuel efficiency of our nation's transportation fleet.[2] Such policies must, however, strike a balance between several statutorily mandated factors, including improved efficiency, technical feasibility, affordability, and our nation's energy and resource security. They must also be technology neutral and solidly grounded in legal authority granted by Congress—in this case, authority granted to NHTSA by the Energy Policy and Conservation Act (EPCA) as amended by

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[1] 88 Fed. Reg. 56,128 (August 17, 2023).
[2] For example, over the last several years, AFPM has been actively advocating for legislation that would require new automobiles to be designed and warrantied to run on a minimum octane rating of 95 RON, which would enable higher compression engines and better fuel efficiency.

the Energy Independence and Security Act (EISA), 49 U.S.C. §§ 32901-32919 (hereafter collectively "EPCA"). NHTSA's Proposal fails to adequately consider these factors and goes beyond its statutory authority.

## I. BACKGROUND

### A. AFPM

AFPM represents the U.S. refining, petrochemical, and midstream industries. In addition to actively pursuing emissions reductions from their operations, our members are increasingly investing in renewable fuels such as ethanol, renewable gasoline, renewable diesel, and sustainable aviation fuel. We are committed to delivering affordable and reliable fuels that power our transportation needs and enable our nation to thrive. Importantly, the U.S. refining and petrochemical industries are critical assets for U.S. energy and national security, a fact which NHTSA insufficiently considers.

Ongoing investments to maintain and improve their manufacturing facilities have made U.S. refineries among the most advanced and efficient in the world. Our companies regularly upgrade, expand, and modernize to increase their efficiency and complexity to meet the changing demand for their products.

In 2022, the U.S. petroleum refining industry invested $13.0 billion to maintain and upgrade their facilities, an increase of 21 percent compared to 2021. Over the next five years the industry is expected to invest $60 billion in their operations.

Our members' environmental stewardship is just as strong, as they spend billions of dollars and the ingenuity of their world-class workforce to reducing emissions and becoming more efficient, conserving energy and water, reducing waste, and preserving and restoring the land and ecosystems around them.

As producers of liquid transportation fuels, AFPM members are directly impacted by this rulemaking regulating the vehicles that consume these products. AFPM members also purchase, lease, and contract for thousands of vehicles and are therefore impacted by this rulemaking, which will increase the prices of new and used motor vehicles and have safety implications associated with operating and sharing the road with those vehicles. AFPM is therefore within the zone of interest of this rule.

### B. Regulatory background

NHTSA's Proposal for new fuel economy standards for passenger cars and light trucks and for heavy-duty pickup trucks and vans (HDPUVs) comes on the heels of multiple other sweeping federal and state proposals in the past 6-12 months that would interact in complicated ways to completely transform the transportation industry in the United States.[3] This is in addition

[3] *See e.g.,* Environmental Protection Agency, Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles, Proposed Rule, 88 Fed. Reg. 29,184 (May 5, 2023);

to several rulemakings established since 2021 by the three major regulatory regimes establishing standards for motor vehicles—NHTSA, U.S. Environmental Protection Agency (EPA), and California Air Resources Board (CARB)—that would address model year (MY) 2023 and beyond, all of which are presently being challenged.[4] In addition, the Department of Energy (DOE) is in the process of evaluating and proposing changes to the petroleum equivalency factor (PEF) utilized by NHTSA and other agencies to account for the "fuel efficiency" of electric vehicles (EVs) (also referred to as ZEVs[5]).[6]

Yet despite the wave of new regulations facing all facets of the transportation sector, in issuing the Proposed Rule, NHTSA has declined to issue a joint rule with EPA—as it has previously—and, perhaps more importantly, failed to harmonize its rulemaking to reduce unnecessary and costly regulatory burden. The standards in the Proposed Rule would contribute to the challenging regulatory landscape facing the industry. We urge NHTSA to reconsider the Proposed Rule in light of the following comments.

## II. EXECUTIVE SUMMARY OF AFPM COMMENTS ON THE PROPOSED RULE

New fuel efficiency standards must be grounded in statutory authority. Congress requires NHTSA to set "maximum feasible" fuel economy standards for passenger cars and light trucks at levels that manufacturers can achieve based on four specifically enumerated factors: (i) technological feasibility, (ii) economic practicability, (iii) the effect of other motor vehicle standards of the Government on fuel economy, and (iv) the need for the United States to conserve energy. Similarly, for commercial medium-duty and heavy-duty vehicles and work trucks, including

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Department of Energy, Petroleum-Equivalent Fuel Economy Calculation, Notice of Proposed Rulemaking; Request for Comment, 88 Fed. Reg. 21,525 (April 11, 2023); Environmental Protection Agency, Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles—Phase 3, Notice of Proposed Rulemaking, 88 Fed. Reg. 25,926 (April 27, 2023); and California Air Resources Board, Advanced Clean Cars (ACC) II standards (see rulemaking documents at https://ww2.arb.ca.gov/rulemaking/2022/advanced-clean-cars-ii) and corresponding section 177 state adoption proposals.

[4] *Texas v. EPA*, No. 22-1031 (D.C. Cir. argued Sept. 14, 2023) (challenging the EPA Greenhouse Gas (GHG) standards for light-duty vehicles for model year 2023 and later); *Nat. Res. Def. Council v. NHTSA*, No. 22-1080 (D.C. Cir. argued Sept. 14, 2023) (challenging National Highway Traffic Safety Administration's Corporate Average Fuel Economy (CAFE) standards for model years 2024-2026; *Ohio et al. v. EPA et al*., No. 22-1081 (D.C. Cir. argued Sept. 15, 2023) (challenging the decision by EPA to reinstate the California Section 209 waiver under the Clean Air Act).

[5] Note that the term "zero emissions vehicle" ("ZEV"), and even near-ZEVs as referenced by NHTSA, is a misnomer. ZEVs are not actually zero emission when accounting for the vehicle lifecycle, including GHG and criteria pollutant emissions associated with electricity generation required for charging certain ZEVs and production of the ZEV vehicle and battery. We recognize that in the Proposed Rule, NHTSA uses "ZEV" to refer only to those vehicles with a specific meaning under California's EV program, but for ease of review, "ZEVs" is used throughout these comments and encompasses all of the EV technologies, including strong hybrid vehicles ("SHEVs") and plug in electric vehicles ("PEVs") such as plug-in hybrid electric vehicles ("PHEVs") and battery electric vehicles ("BEVs").

[6] Department of Energy, Petroleum-Equivalent Fuel Economy Calculation, Notice of Proposed Rulemaking; Request for Comment, 88 Fed. Reg. 21,525 (April 11, 2023).

HDPUVs, NHTSA must set “maximum feasible” fuel economy standards that are (i) appropriate, (ii) cost-effective, and (iii) technologically feasible.

For the reasons set forth below and in the attached Appendices, NHTSA has departed from Congressional intent and proposed standards that do not meet statutory requirements. In particular, we believe that NHTSA exceeds its legal authority by setting the fuel economy standards at a level that is not feasibly achievable by internal combustion engine vehicles (ICEVs), effectively establishing a *de facto* electric vehicle mandate. EPCA does not afford NHTSA such authority. We also believe that NHTSA does an inadequate job balancing the factors EPCA requires it to consider when establishing fuel economy standards for passenger cars and light duty trucks, as well as HDPUVs, and that the agency should be more transparent and realistic about the costs and benefits of the Proposed Rule and the impact that the implicit electric vehicle mandate would have on consumers, supply chains, and national security. Appendix A, AFPM Legal Review of NHTSA’s Proposed CAFE Standards for MYs 2027-2032 Passenger Cars and Light Trucks and Fuel Efficiency Standards for MYs 2030-2035 Heavy-Duty Pickup Trucks and Vans (AFPM Legal Review), and Appendix B, Trinity Consultants Technical Review of NHTSA’s Proposed CAFE Standards for MYs 2027-2032 Passenger Cars and Light Trucks and Fuel Efficiency Standards for MYs 2030-2035 Heavy-Duty Pickup Trucks and Vans (Trinity Technical Review), further detail AFPM’s concerns and comments on the Proposed Rule, as summarized below, and demonstrate that the Proposed Rule exceeds NHTSA’s statutory authority.

## III. NHTSA’S PROPOSAL COMPROMISES ENERGY AND NATIONAL SECURITY

NHTSA fails to adequately analyze the energy and national security implications of its Proposal. In contrast to the time EPCA was passed in the aftermath of the Arab Oil Embargo, the U.S. is now a net exporter of crude oil and petroleum products. The U.S. is also the world’s largest producer of biofuels, including ethanol and renewable diesel. Our domestic liquid fuels industries have made the U.S. more energy secure. NHTSA’s EV mandate policy trades away our hard-earned energy security to countries that control the supply of battery raw materials, most notably China. As a result, NHTSA’s Proposal needlessly compromises our energy and national security.

NHTSA’s EV mandate will make U.S. automakers dependent on foreign suppliers for battery minerals and EV manufacturing. China maintains a controlling position in the material extraction, processing, and battery production necessary to produce EVs. China’s dominance extends into countries on other continents where the mineral extraction occurs by owning a full or partial stake in mines and other assets in mineral extraction. And in most cases, the areas of the world where battery raw materials are extracted are more politically unstable than the sources of imported petroleum. NHTSA needs to consider that the energy security landscape has changed dramatically over the last decade and recognize that a forced vehicle electrification strategy, particularly in the timeline of the Proposed Rule, puts U.S. energy and national security in reverse.

## IV. THE PROPOSED CAFE STANDARDS VIOLATE EPCA BY FAILING TO ESTABLISH MAXIMUM FEASIBLE AVERAGE FUEL ECONOMY STANDARDS FOR PASSENGER CARS AND LIGHT-DUTY-TRUCKS

NHTSA's proposed standards for passenger cars and light-duty trucks exceed NHTSA's statutory authority and are not achievable nor feasible for the industry in the timeframe proposed. Importantly, in proposing these unachievable standards, NHTSA relied on factors that it is statutorily prohibited from considering. As set forth below, NHTSA inappropriately accounted for ZEVs in its baseline and standard modeling, despite a clear statutory directive and Congressional intent not to consider EVs.[7] Congress included an explicit prohibition to ensure that EVs remain the compliance flexibility that Congress intended them to be – and not become a regulatory mandate. Despite that clear prohibition, NHTSA openly considered electric vehicles in deciding the maximum fuel-economy level that automakers can feasibly achieve. NHTSA evades the clear statutory prohibition by introducing extratextual exceptions to the application of its authority, specifically that NHTSA considered electric vehicles by assuming EVs in the vehicle fleet in establishing a modeling baseline. As a result, the proposed standards are not feasibly achievable by ICEVs effectively establishing an EV mandate.

## V. THE PROPOSED CAFE STANDARDS VIOLATE EPCA BY FAILING TO ESTABLISH MAXIMUM FEASIBLE AVERAGE FUEL ECONOMY STANDARDS FOR HEAVY DUTY PICKUP TRUCKS AND VANS (HDPUVS)

NHTSA must set "maximum feasible" fuel economy standards for commercial medium-duty and heavy-duty vehicles and work trucks, including HDPUVs that are "appropriate, cost-effective, and technologically feasible."[8] NHTSA's proposed standards fail to meet these requirements. Fuel efficiency is proposed, on average, to increase by 10 percent per year, year over year, for MY 2030–2035 under NHTSA's preferred alternative. NHTSA has done little to evaluate that such stringency increase is "appropriate, cost-effective, and technologically feasible" for the commercial HDPUV fleet and in fact has abrogated its responsibility to do so by assuming that the majority of the HDPUV fleet would have largely become compliant by 2030 under the "No Action" alternative. By failing to explain these factors, NHTSA has prevented the public's ability to provide informed comment.

NHTSA asserts wide discretion in considering what is "appropriate" for the medium- and heavy-duty fleet yet fails to consider how appropriate it is to consider electric vehicles in a standard regulating the efficiency of ICEVs. All of the same concerns about NHTSA's Proposal for passenger cars and light trucks, including concerns that NHTSA's purported discretion exceeds its statutory authority and raises "major questions," concerns that the Proposal is not feasible, and security concerns related to relying on electrification are equally relevant to the proposed HDPUV standards. This includes over-estimating the Proposal's assumed energy conservation and environmental benefits that fail to adequately consider the Proposal's impact on the generation, transmission, and distribution of electricity, and the full lifecycle "cradle to grave"

[7] 49 U.S.C. § 32902(h)(1)
[8] 49 U.S.C. § 32902(k)(2).

impacts of electric vehicle ownership. Similar to NHTSA's treatment of passenger cars, NHTSA does not conduct a full lifecycle analysis of medium- and heavy-duty vehicles that is necessary to fully assess the Proposal's environmental impact and necessary for NHTSA to assert any co-benefit from the Proposal.

Negative consequences to consumers and commercial operators, including on employment, are ignored in the Proposal. Businesses must respond to the significant costs to commercial fleet operators associated with the purchase, use, and maintenance of HDPUV ZEVs. NHTSA declined to consider that the Proposal may have dramatic effects on commercial business models, including companies that may not be capable of operating as many vehicles, or employing as many staff. NHTSA similarly over-estimates the technical feasibility of the Proposal by assuming exponential growth in the adoption of electric HDPUVs that currently don't exist, and without a full assessment of the range needs of EVs in commercial use.

Appendix A AFPM Legal Review and Appendix B Trinity Technical Review elaborate on each of these factors and demonstrate that NHTSA's Proposal does not meet EPCA's statutory requirements.

## VI. NHTSA'S DRAFT ENVIRONMENTAL IMPACT STATEMENT FAILS TO SATISFY THE NATIONAL ENVIRONMENTAL POLICY ACT

As submitted in simultaneous comments to NHTSA's EIS docket, AFPM believes NHTSA has failed to take a sufficient hard look or analyze sufficient reasonable alternatives to satisfy the National Environmental Policy Act (NEPA).

As detailed in Appendix C AFPM Comments on NHTSA's Draft Environmental Impact Statement (DEIS) (AFPM DEIS Comments) and incorporated herein by reference, NHTSA's alternatives are inadequate. Specifically, NHTSA failed to consider a range of feasible alternatives. Indeed, two passenger car and light tuck alternatives (PC3LT5 and PC6LT8) and one heavy duty alternative (HDPUV14) are so infeasible that NHTSA could not adopt them. Moreover, NHTSA's Proposal implicates the major questions doctrine and, therefore, NHTSA lacks the authority to adopt the proposed standard. Finally, NHTSA's alternatives do not address reasonably available, cost-effective mitigation measures.

NHTSA's analyses of the ability of the proposed CAFE standards to conserve energy, air quality impacts, and direct and indirect impacts on climate change and GHG emissions are based on faulty assumptions and the analysis is highly uncertain. The DEIS's lifecycle assessment system boundary is woefully narrow, failing to analyze all environmental impacts (e.g., land use, resource depletion, water use, and eutrophication) associated with extracting all raw materials needed to produce and operate EVs and ICEVs. Moreover, NHTSA must conduct a systemic, interdisciplinary evaluation of the economic impact (e.g., impact on jobs and worker wages), safety considerations, and the proposed standard's impact on fleet turnover and local air quality.

## VII. THE PROPOSAL FAILS TO PROVIDE MEANINGFUL OPPORTUNITY FOR PUBLIC COMMENT

AFPM welcomes the opportunity to meaningfully engage with regulators to discuss cost-effective, efficient, and feasible measures to improve the fuel efficiency of the transportation sector. Unfortunately, the 60-day comment period is not sufficient to coordinate an adequate response to the sheer volume of data in the rulemaking docket. Upon publication of the Proposed Rule itself in the Federal Register, additional materials including various modeling scenarios and technical analyses, that amount to over 5,000 pages of technically complex materials were made available, including a technical correction published twelve days later. NHTSA refused to grant AFPM's request for additional time, despite Executive Order 12866 guidance that a 60-day comment period is the minimum expectation. The sweeping scope of NHTSA's Proposal to completely transform the U.S. transportation industry requires considerably more time, particularly considering the numerous instances in which NHTSA's analysis is inaccurate, incomplete, or misleading. NHTSA also narrowly limited the identification of industries affected by the Proposal by providing a short and incomplete list of NAICS codes in the Federal Register publication. Taken together, NHTSA's actions are at odds with its responsibilities under the Administrative Procedure Act and the Due Process Clause of the U.S. Constitution.

## VIII. CONCLUSION

Rather than secure our nation's energy and national security, NHTSA departed from Congressional intent by proposing standards that do not meet statutory requirements. NHTSA exceeded its legal authority by setting the fuel economy standards at a level that is not achievable by ICEVs, effectively establishing a *de facto* EV mandate. Despite EPCA's explicit instruction, NHTSA improperly considered EVs when setting CAFE standards for passenger cars and light-duty trucks. NHTSA failed to set "maximum feasible" fuel economy standards that ICEVs can achieve based on the four statutory factors, Similarly, the proposed fuel efficiency standards for commercial medium-duty and heavy-duty vehicles and work trucks, including HDPUVs are not (i) appropriate, (ii) cost-effective, and (iii) technologically feasible. For these reasons, NHTSA should withdraw the Proposed Rule.

Respectfully submitted,

Leslie Bellas
Vice President, Regulatory Affairs
American Fuel & Petrochemical Manufacturers

## APPENDIX A

**AFPM Legal Review of NHTSA's Proposed CAFE Standards for MYs 2027-2032 Passenger Cars and Light Trucks and Fuel Efficiency Standards for MYs 2030-2035 Heavy-Duty Pickup Trucks and Vans**

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## I. INTRODUCTION

New fuel economy standards for passenger cars and light trucks and fuel efficiency standards for heavy-duty pickup trucks and vans (HDPUVs) must be grounded in legal authority granted to NHTSA by the Energy Policy and Conservation Act (EPCA), as amended by the Energy Independence and Security Act (EISA), 49 U.S.C. §§ 32901-32919 (hereafter collectively "EPCA"). As described further below, NHTSA's Proposal fails to adequately consider these factors and goes beyond its statutory authority.

Congress requires NHTSA to set "maximum feasible" fuel economy standards for passenger cars and light trucks at levels that manufacturers can achieve based on four specifically-enumerated factors: (i) technological feasibility, (ii) economic practicability, (iii) the effect of other motor vehicle standards of the Government on fuel economy, and (iv) the need for the United States to conserve energy.[9] Similarly, for commercial medium-duty and heavy-duty vehicles and work trucks, including HDPUVs, NHTSA must set "maximum feasible" fuel efficiency standards that are (i) appropriate, (ii) cost-effective, and (iii) technologically feasible.[10] NHTSA's proposed standards depart from Congressional intent and do not meet EPCA's statutory requirements. In particular, NHTSA exceeds its legal authority by setting the fuel economy standards at a level that is not feasibly achievable by internal combustion engine vehicles (ICEVs), effectively establishing a *de facto* electric vehicle (EV) (also referred to as ZEV[11]) mandate. EPCA does not afford NHTSA such authority. Also, NHTSA inadequately balances the factors EPCA requires it to consider when establishing fuel economy standards for passenger cars and light duty trucks, as well as HDPUVs. The agency should be more transparent and realistic about the costs and benefits of the Proposed Rule and the impact that the implicit EV mandate would have on consumers, supply chains, and national security.

## II. NHTSA'S PROPOSAL COMPROMISES ENERGY AND NATIONAL SECURITY

Congress passed EPCA in the aftermath of the Arab Oil Embargo and authorized NHTSA to establish fuel economy standards to increase energy security and reduce dependence on foreign oil. Thanks to American ingenuity and tremendous efficiency in the refining sector, the United States (U.S.) produces more oil and refined products than it ever has in its history. NHTSA's Proposed Rule fails to adequately analyze its national security implications, an issue of central relevance to the primary purpose of its enabling statute.

Horizontal drilling technology, combined with advanced completions procedures, allowed the U.S. to experience a dramatic improvement in crude and gasoline production since EPCA's

[9] 49 U.S.C. § 32902(f).
[10] 49 U.S.C. § 32902(k)(2).
[11] Note that the term "zero emissions vehicle" (ZEV), and even near-ZEVs as referenced by NHTSA, is a misnomer. ZEVs are not actually zero emission when accounting for the vehicle lifecycle, including GHG and criteria pollutant emissions associated with electricity generation required for charging certain ZEVs and production of the ZEV vehicle and battery. We recognize that in the Proposed Rule, NHTSA uses "ZEV" to refer only to those vehicles with a specific meaning under California's EV program, but for ease of review, "ZEVs" is used throughout these comments and encompasses all of the EV technologies, including strong hybrid electric vehicles (SHEVs) and plug in electric vehicles (PEVs) such as plug-in hybrid electric vehicles (PHEVs) and battery electric vehicles (BEVs).

passage, so much so that the U.S. is now a net exporter of energy.[12] In 2022, the U.S. was both the world's top oil producer and oil refiner, responsible for ~20% of refined products globally.[13] At the same time, the Renewable Fuel Standard (RFS) and the industry's commitment to renewable fuels has lowered the carbon intensity of transportation fuels. U.S. total annual crude oil exports have increased steadily since 2010 and reached a record high in 2022 of about 3.58 million barrels per day (b/d).[14] The U.S. refining sector is exceedingly competitive in the global marketplace and is well positioned to excel in markets outside of the U.S. As Energy Information Administration (EIA) data show, U.S. exports of finished gasoline more than doubled between 2010 and 2019, from 1.07 million barrels annually to 2.97 million barrels. Additionally, an estimated 70,000 industrial and consumer products rely on chemicals or oil-based feedstocks produced at our members' refineries.[15]

While liquid fuels have never been stronger in America, the Agency is effectively forcing electrification which requires substantial, foreign-sourced raw and processed materials to produce ZEV batteries. This Proposal, taken to its logical end, would put the U.S. into a situation resembling the oil embargoes of the 1970s, where foreign actors control majorities of the critical raw material supplies used to provide transportation mobility services for the U.S. consumer. Indeed, China dominates the global supply chain for battery production. Forced electrification would make the United States beholden to China and other nations controlling the minerals required to manufacture ZEV batteries and other components. As a result, NHTSA's Proposal compromises the United States energy and national security interests.

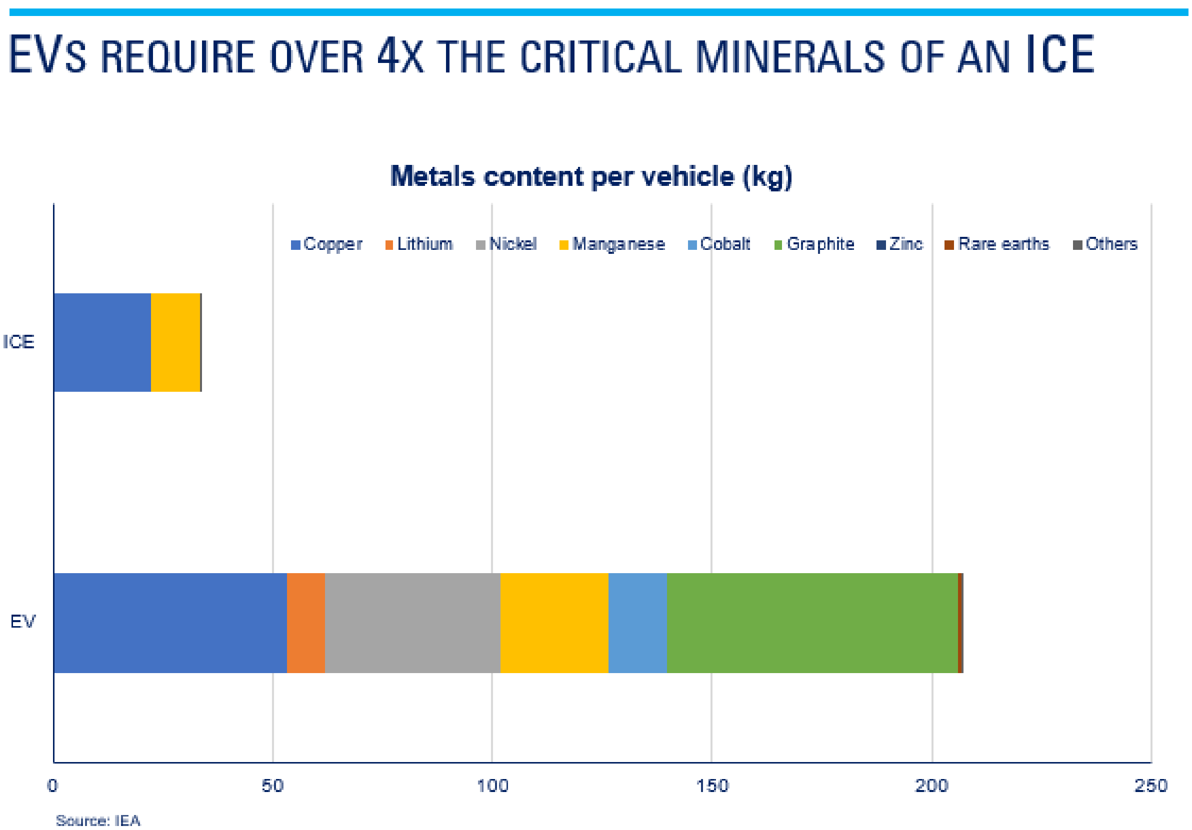
### A. The Proposal would make OEMs dependent on foreign suppliers for battery minerals and EV manufacturing

NHTSA's Proposal incorporates ZEV penetration rates into its underlying baseline calculation and modeling of the proposed standards. However, NHTSA has not sufficiently considered the serious dearth of domestic materials required to facilitate the contemplated EV production. The supply chain necessary to support these new technologies is far from assured and is likely to increase dependence on critical raw materials from foreign sources. Over-reliance on EVs on the timeline required by the Proposed Rule will result in a non-resilient transportation sector that is vulnerable to unexpected disruptions. For instance, both the federal government and the private sector recognize that critical minerals are essential to the future of ZEVs. Unstable critical mineral supply chains could disrupt this future. ZEVs, as compared to ICEVs, have a much

[12] "U.S. energy facts explained: imports and exports" U.S. Energy Information Administration (EIA), available at https://www.eia.gov/energyexplained/us-energy-facts/imports-and-exports.php ("The United States has been an annual net total energy exporter since 2019.").
[13] Department of Energy, Pathways to Commercial Liftoff: Decarbonizing Chemical and Refining, Sept. 2023 at 1. Available at Pathways to Commercial Liftoff: Decarbonizing Chemicals & Refining (energy.gov).
[14] "Petroleum & Other Liquids – Exports" U.S. Energy Information Administration (EIA), available at https://www.eia.gov/dnav/pet/pet_move_exp_dc_NUS-Z00_mbblpd_a.htm.
[15] Department of Energy, Pathways to Commercial Liftoff: Decarbonizing Chemical and Refining, Sept. 2023 at 12. Available at Pathways to Commercial Liftoff: Decarbonizing Chemicals & Refining (energy.gov).

greater reliance on several critical minerals, as seen in Figure 1 below. There are six minerals critical to the production of ZEVs: cobalt, copper, graphite, lithium, manganese, and nickel.[16]

**Figure 1: Metal intensity – ICE vs. EV[17]**




The intensity of other critical minerals in the manufacturing of EVs is driven by the chemistry used in batteries. While new battery chemistries and types (*e.g.*, solid-state batteries) could potentially reduce the reliance on these critical minerals in the future, these technologies are unlikely to be commercially viable before model year (MY) 2032. Moreover, even if a new, less critical-mineral-intense battery technology emerges, EVs would still rely on sufficient copper availability for mass production of vehicles and expansion of the grid.

These minerals are essential to many components of a lower-carbon energy system beyond ZEV batteries, such as solar photovoltaic cells, wind turbines, and hydrogen electrolyzers. In addition, these minerals have multiple traditional uses, such as military defense systems, aerospace, mobile phones, computers, fiber-optic cables, semi-conductors, medical applications, and even bank notes. Without substantial increases in new raw material extraction capacity, competition for these minerals will materially stiffen with increased electrification and the shift in

[16] INTERNATIONAL ENERGY ADMINISTRATION, "The Role of Critical Minerals in Clean Energy Transitions," (revised March 2022) *available at* https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions. [hereinafter IEA Report 2022].
[17] TURNER, MASON & COMPANY. "Evaluation of EPA's Assumptions and Analyses Used in Their Proposed Rule for Multi-Pollutant Emissions Standards" (June 7, 2023) (Research funded by AFPM and available upon request) [hereinafter "Turner Mason Report"].

underlying grid energy mix. An acceleration in demand for these key minerals could result in price volatility stemming from supply disruptions and/or geopolitical pressures. It is not reasonable for NHTSA to turn its back on this issue of central relevance in the Proposal.

This new demand for foreign-sourced materials will upset the decades of progress the U.S. has made in energy security where we are currently a net exporter of petroleum and petroleum products and undermine the security provided by the domestic refining industry. Sourcing critical minerals and building a secure, North American supply chain for EVs, on the timeline required by the Proposed Rule, is not guaranteed as foreign production and processing of critical minerals have an established, large market share and competitive advantage today. The lack of a domestic manufacturing sourcing requirement for HDPUV in Inflation Reduction Act ("IRA") further promotes sourcing of foreign critical material for battery production.

NHTSA's reliance on unrealistic ZEV penetration rates in its baseline calculation and standard modeling severely overestimates both the availability of minerals and processing infrastructure and capabilities in the U.S. Regarding the availability of critical minerals, especially those essential to the manufacturing of a Li-ion battery, the supply is dominated by three lithium producing countries as summarized in Figure 2 below. Of the foreign nations that produce cobalt, molybdenum, and other minerals needed to produce BEVs, China has disproportionate influence. While 70% of global cobalt production comes from the Democratic Republic of Congo,[18] most of the mines are owned/operated by China and more than 60 percent of cobalt processing is located in China. China produces 67 percent of the world's graphite.[19] The U.S. imports most of its manganese from Gabon, a less geopolitically stable country that recently experienced a military coup,[20] providing 65 percent of the United States' supply.[21]

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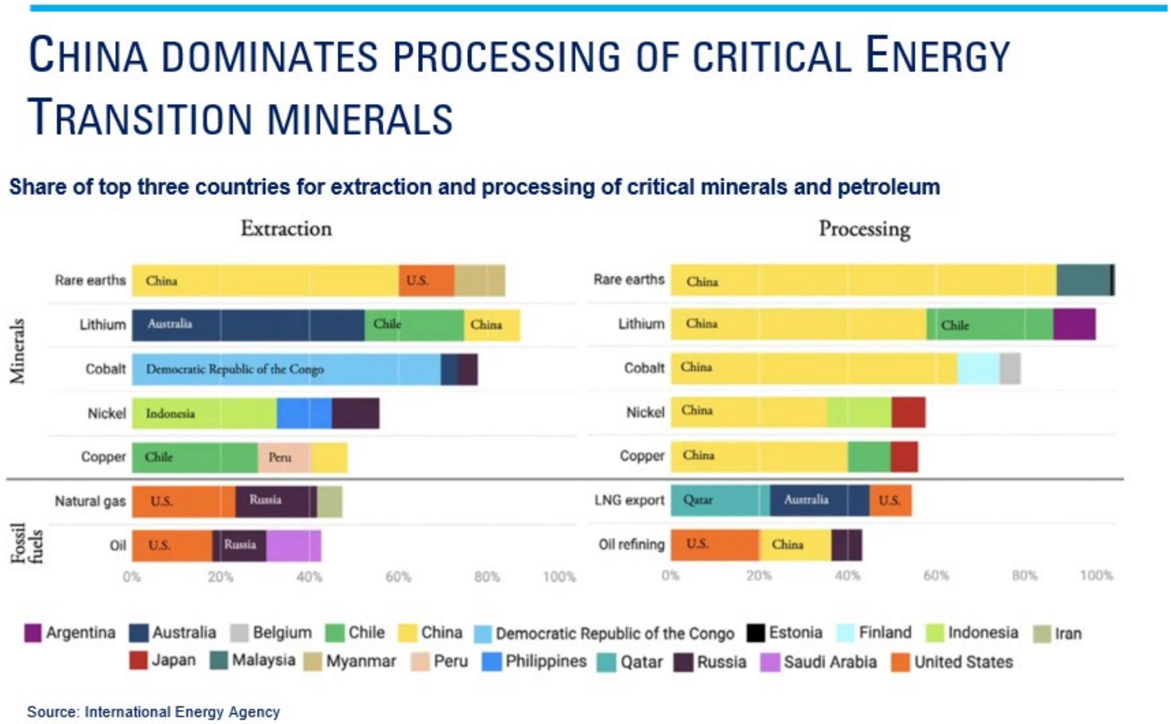
[18] International Energy Agency, *The Role of Critical Minerals in Clean Energy Transitions* (March 2022), *available at* https://iea.blob.core.windows.net/assets/ffd2a83b-8c30-4e9d-980a-52b6d9a86fdc/TheRoleofCriticalMineralsinCleanEnergyTransitions.pdf.

[19] Robinson, G.R., Jr., Hammarstrom, J.M., and Olson, D.W., 2017, Graphite, chap. J of Schulz, K.J., DeYoung, J.H., Jr., Seal, R.R., II, and Bradley, D.C., eds., Critical mineral resources of the United States—Economic and environmental geology and prospects for future supply: U.S. Geological Survey Professional Paper 1802, p. J1–J24, https://doi.org/10.3133/pp1802J.

[20] UN News, *UN chief 'firmly condemns' Gabon coup, notes reports of election abuses* (August 30, 2023), *available at* https://www.un.org/africarenewal/magazine/august-2023/un-chief-%E2%80%98firmly-condemns%E2%80%99-gabon-coup-notes-reports-election-abuses.

[21] OEC, "Manganese Ore in the United States" (Mar. 2023) *available at* https://oec.world/en/profile/bilateral-product/manganese-ore/reporter/usa.

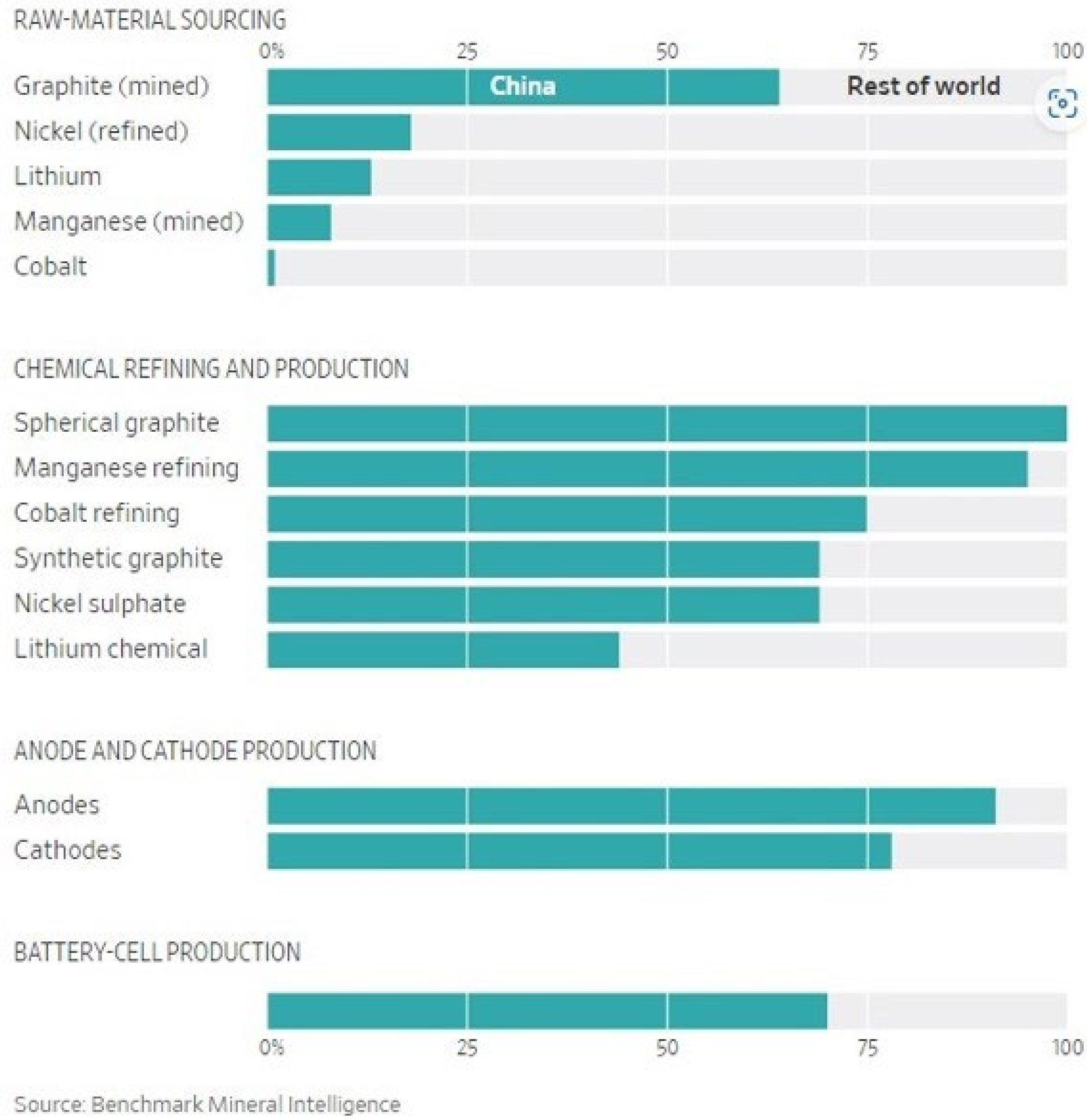
**Figure 2: U.S. lack of critical mineral extraction or processing capacity**




China's dominance does not stop at critical mineral extraction and processing. China produces 75 percent of all Li-ion batteries and houses the production capacity for 70 percent of cathodes and 85 percent of anodes (both key battery components).[22] Figure 3 details China's dominance of the lithium-ion battery supply chain in 2022.

[22] International Energy Agency, "Global Supply Chains of EV Batteries," (July 2022), https://iea.blob.core.windows.net/assets/961cfc6c-6a8c-42bb-a3ef-57f3657b7aca/GlobalSupplyChainsofEVBatteries.pdf.

**Figure 3: China's share of the lithium-ion battery supply chain in 2022**




Conversely, the U.S. currently plays a very small role in the global EV supply chain, with only 7 percent of battery production capacity.[23] In fact, Ford Motor Company announced last month that it is "pausing" construction of one of its electric battery plants in Michigan to ensure the products are price competitive.[24]

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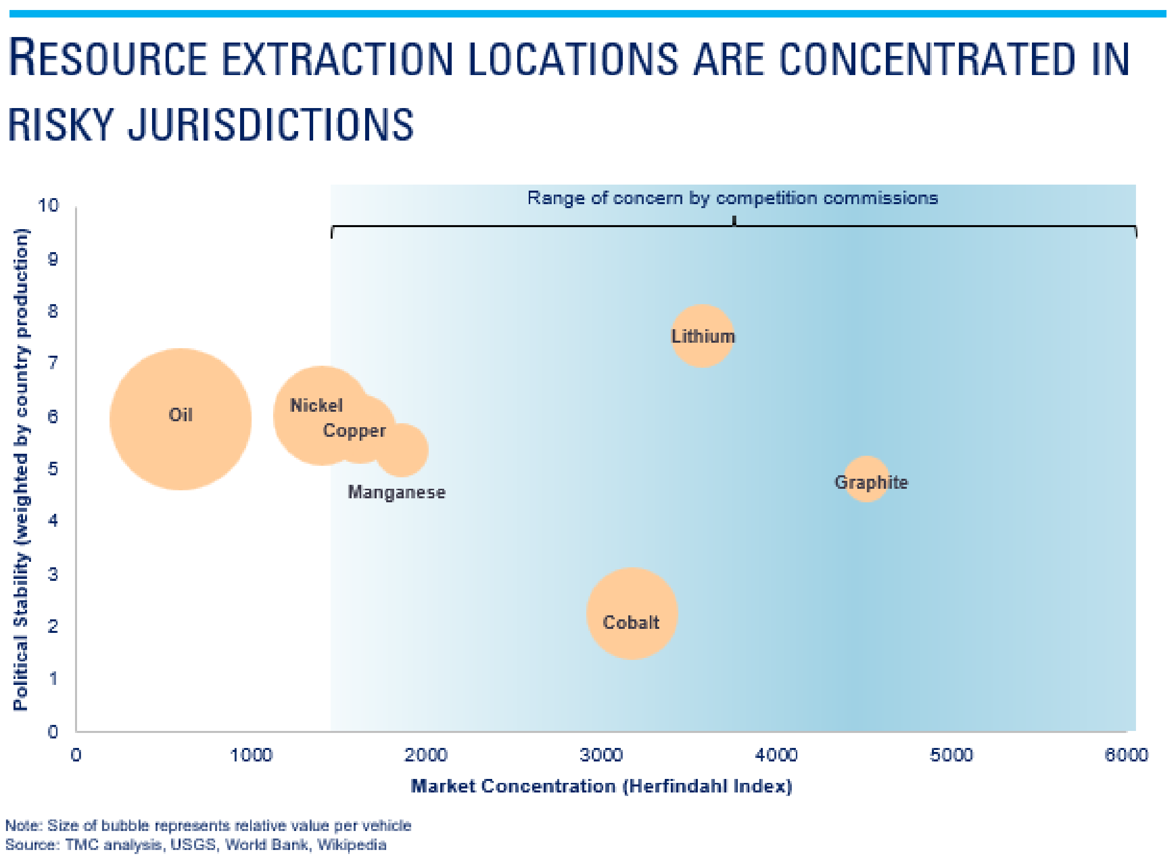
[23] *See id*. Regardless of recent funding awarded by the Department of Energy to construct three battery plants, the domestic supply of these critical minerals remains unchanged and, once these manufacturing facilities are permitted, constructed, and operable, they will rely heavily on foreign-sourced materials to maximize capacity and output, if even possible.

[24] Jack Ewing, Ford Halts Work on EV Battery Plant in Michigan, New York Times, Sept. 25, 2023. Retrieved from https://www.nytimes.com/2023/09/25/business/energy-environment/ford-battery-plant-michigan.html.

In contrast to oil, which has a lower global market concentration than the critical minerals required for EVs, Figure 4 below shows that the most critical materials for EVs are also in less politically stable jurisdictions. Other than lithium production which is dominated by Australia (52%), all other critical EV minerals have a political stability index less than oil. As demand for these commodities grows, the market concentration (and ability to exert power over pricing and access) swings towards producers in less politically stable countries. Producer countries having market power have the potential to impact not only price, but the ability for consumer countries to influence other issues, such as sanctity of commercial contracts, labor and/or human rights, and environmental standards in the producing jurisdictions. The significance of this issue is compounded by the fact that multiple critical minerals are needed for EV production, so a disruption in the supply of a single mineral can disable the entire supply chain. The operation of ICEVs, on the contrary, relies on a natural resource for which there is an abundant domestic supply.

**Figure 4: U.S. risk exposure to critical energy resources**




The invasion of Ukraine reminds governments and businesses of the importance of assessing, planning, and mitigating risks. As we have seen with Europe shifting to several new natural gas supplies (mostly through LNG receipts), supply diversification is an important way to mitigate risk. The key tenet of risk mitigation is not about removing the likelihood of a risk but about reducing its impact to an acceptable level; this is the primary justification for the U.S. holding a Strategic Petroleum Reserve. Exposing U.S. mobility to the risk of critical mineral supply availability raises an energy security question: How best does the U.S. trade risks it can mitigate for risks it cannot?

Despite the significant energy security concerns raised by increased reliance on critical minerals resulting from NHTSA's implicit EV mandate, the Proposed Rule minimizes such concerns as "emerging energy security considerations" and gives them limited and superficial consideration. NHTSA asserts that "energy security has traditionally referred to the nation's ability to reliably acquire petroleum in sufficient quantities to meet domestic demand (for gasoline, in particular), and to do so at an acceptable cost," and then observes that "[h]owever, as the number of electric vehicles on the road continues to increase, the concept of energy security is *likely* to expand to encompass the United States' ability to supply the materials necessary to build these vehicles and the additional electricity necessary to power their use."[25] NHTSA acknowledges that "the most commonly used vehicle battery chemistries include materials that are either scarce or expensive, are sourced from potentially insecure or unstable overseas sites, and can pose environmental challenges during extraction and conversion to usable material," and further that "[k]nown supplies of some of these critical minerals are also highly concentrated in a few countries and therefore face the same market power concerns as petroleum products."[26] Despite these acknowledgements, NHTSA nonetheless "does not include costs or benefits related to these emerging security considerations in its analysis for this proposed rule."[27] This omission is arbitrary and capricious.

NHTSA's assertion that the concept of energy security does not currently encompass the United States' ability to supply the materials necessary to build these vehicles is unsupported, contrary to the current realities of the vehicle battery market, and is owed no deference. As reported by the International Energy Agency,

> "[a]utomotive "lithium-ion (Li-ion) battery demand increased by about 65% to 550 GWh in 2022, from about 330 GWh in 2021, primarily as a result of growth in electric passenger car sales [ ]. In China, battery demand for vehicles grew over 70%, while electric car sales increased by 80% in 2022 relative to 2021, with growth in battery demand slightly tempered by an increasing share of PHEVs. Battery demand for vehicles in the United States grew by around 80%, despite electric car sales only increasing by around 55% in 2022. While the average battery size for battery electric cars in the United States only grew by about 7% in 2022, the average battery electric car battery size remains about 40% higher than the global average, due in part to the higher share of SUVs in US electric car sales relative to other major markets, as well as manufacturers' strategies to offer longer all-electric driving ranges. Global sales of BEV and PHEV cars are outpacing sales of hybrid electric vehicles

[25] Draft TSD Chapter 6.2.4.6 Emerging Energy Considerations, 6-58 (emphasis added).
[26] 88 Fed. Reg. at 56,254.
[27] *Id*.

(HEVs), and as BEV and PHEV battery sizes are larger, battery demand further increases as a result."[28]

The increasing global demand for vehicle batteries and the critical materials that make up those batteries is significant and will continue to expand in response to government initiatives, including, if adopted, NHTSA's proposed CAFE standards for passenger cars and light trucks and fuel efficiency standards for HDPUVs resulting in an implicit EV mandate. The concept of energy security already encompasses the United States' ability to supply these critical materials—whether NHTSA chooses to acknowledge it or not—and failing to meaningfully consider the issue at this critical juncture could result in NHTSA plunging the U.S. into dependence on foreign suppliers for these energy related materials and the inherent risks that accompany energy dependence.

In the Draft Technical Support Document (TSD) for Corporate Average Fuel Economy Standards for Passenger Cars and Light Trucks for Model Years 2027–2032 and Fuel Efficiency Standards for Heavy-Duty Pickup Trucks and Vans for Model Years 2030–2035 July 2023, NHTSA notes the geopolitical challenges related to accessing vehicle battery materials but then dilutes the risks by including additional facts and data related to other more stable aspects of the mining and processing of critical minerals. No amount of select data, however, can disguise the current reality, acknowledged by NHTSA, that "a significant share of processing for lithium is currently done in China," "China is the largest importer of unprocessed lithium," "the leading producer of refined cobalt," "one of the leading producers of primary nickel products," "one of the leading refiners of nickel into nickel sulfate, the chemical compound used for cathodes in lithium-ion batteries," and "one of the leading processors of graphite intended for use in lithium-ion batteries as well."[29] Although the Draft TSD and a handful of references acknowledge China's dominance over the critical minerals needed for EVs, the NPRM does not address or mention China in the context of "energy security considerations." [30]

[28] See the section "Trends in Batteries" from "Global EV Outlook" International Energy Agency, 2023 (internal quotations omitted). Available at Trends in batteries – Global EV Outlook 2023 – Analysis - IEA.

[29] Draft TSD, Chapter 6.2.4.6 Emerging Energy Considerations, at 6-58-6-59. Although NHTSA acknowledges that China has 65% of the global total mining production of graphite, with Mozambique following at 13%, Madagascar at 8%, Brazil at 7% and the US at 0%, NHTSA nonetheless asserts that "[o]btaining graphite for batteries does not currently pose geopolitical obstacles." *Id.* at 6-59. NHTSA does allude to potential future concerns commenting that "the U.S. International Trade Commission (USITC) notes that Turkey has great potential to become a large graphite producer, due to its large reserves shown in the final column of Table 6-26, which would make its political stability of increased larger concern," but stops short of acknowledging current market concerns. *Id.*

[30] As a harbinger of potential future market and supply manipulation by China in connection with vehicle battery materials, China recently blocked international sales of two rare minerals essential to manufacturing semiconductors – gallium and germanium – due to claimed national security concerns. Jon Emont, "China Controls Minerals that Run the World – and It Just Fired a Warning Shot at U.S.", The Wall Street Journal, July 7, 2023, available at https://www.wsj.com/articles/china-controls-minerals-that-run-the-worldand-just-fired-a-warning-shot-at-u-s-5961d77b. We also note China's apparent withholding of graphite from Sweden. As China seeks to gain market share in the European battery market, one of the most competitive firms in Europe's battery business, Northvolt of Sweden, has been largely cut off from its Chinese suppliers of graphite for the past three years. "Why is China blocking graphite exports to Sweden?", The Economist, June 22, 2023, available at https://www.economist.com/business/2023/06/22/why-is-china-blocking-graphite-exports-to-sweden.

Following the Draft TSD discussion of the vehicle battery critical materials market, NHTSA again avoids concluding that the apprehensions raised are a current energy security concern and states instead that "[t]he agency will continue to monitor these issues going forward and determine whether access to these materials constitutes a new form of energy security for which future analyses must account."[31] For the reasons explained herein, U.S. access to these materials is a form of energy security and we respectfully request that NHTSA engage in the appropriate statutory analysis for both the passenger car and light truck standards as well as the HDPUV standards, and in particular for HDPUVs for which NHTSA's determination is not prohibited from including EVs.[32] There are numerous studies and public commentary that discuss critical minerals in the context of U.S. energy security, which attest to the common sense understanding that critical minerals are a part of U.S. energy security[33] and which it would be arbitrary and capricious for the agency to ignore. Similarly, in response to NHTSA's decision to "not include costs or benefits related to these emerging energy security considerations in its analysis for this proposed rule" and NHTSA's request for "comment on whether it is appropriate to include an estimate in the analysis and, if so, which data sources and methodologies it should employ,"[34] we would have welcomed the opportunity to submit additional data if sufficient time was allotted to provide comment on NHTSA's 260+ page NPRM and 5,000+ pages of supporting documentation.

Beyond the EV itself, electricity networks need a large amount of copper and aluminum. The need for grid expansion that would result from this rapid increase in electricity demand underpins a doubling of annual demand for copper and aluminum.[35] China possesses over half of the entire world's aluminum smelting capacity. NHTSA's Proposed Rule does not consider the demand for copper. For example, recent data concludes that sourcing copper for electric infrastructure (*e.g.*, charging stations and storage) needed to accommodate increased electrical demand will be challenging.[36] Demand for copper is expected to rise by 53% when supply is

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[31] Draft TSD, Chapter 6.2.4.6 Emerging Energy Considerations, at 6-60.
[32] NHTSA confirmed that "[t]he discussion about energy security effects of passenger car and light truck standards applies for HDPUVs as well." 88 Fed. Reg. at 56,352.
[33] *E.g.* Critical Minerals and the Question of Energy Security, Citigroup Inc. (June 30, 2023), https://icg.citi.com/icghome/what-we-think/global-insights/insights/critical-minerals-and-the-question-of-energy-security-; Morgan D. Bazilian, The Inflation Reduction Act Is the Start of Reclaiming Critical Mineral Chains, Foreign Policy (September 16, 2022), https://foreignpolicy.com/2022/09/16/inflation-reduction-act-critical-mineral-chains-congress-biden/; Rodrigo Castillo and Caitlin Purdy, China's role in supplying critical minerals for the global energy transition: What could the future hold?, Brookings (August 1, 2022), https://www.brookings.edu/articles/chinas-role-in-supplying-critical-minerals-for-the-global-energy-transition-what-could-the-future-hold/; Energy Security and the risk of disorderly change, IEA, https://www.iea.org/reports/world-energy-outlook-2021/energy-security-and-the-risk-of-disorderly-change (last visited Oct. 16, 2023). Indeed, according to Deputy Secretary of Energy David Turk, "American energy security and 21st century competitiveness hinge on a robust supply of critical minerals and materials," thus recognizing that critical minerals raise energy security concerns. U.S. Departments of Energy, State and Defense to Launch Effort to Enhance National Defense Stockpile with Critical Minerals for Clean Energy Technologies (February 25, 2022), https://www.energy.gov/ia/articles/us-departments-energy-state-and-defense-launch-effort-enhance-national-defense.
[34] 88 Fed. Reg. at 56,254.
[35] INTERNATIONAL ENERGY AGENCY, *The Role of Critical Minerals in Clean Energy Transitions* (March 2022), *available at* https://iea.blob.core.windows.net/assets/ffd2a83b-8c30-4e9d-980a-52b6d9a86fdc/TheRoleofCriticalMineralsinCleanEnergyTransitions.pdf.
[36] *Id.*

expected to rise by only 16%.[37] Indeed, by 2030, the expected supply from existing mines and projects under construction is estimated to meet only 80% of copper needs by 2030[38]—without even considering the supply and demand implications from increased reliance on EVs in the transportation sector.

### B. Availability of North American Crude, Refining, and Biofuel capacity makes the U.S. energy-secure

Unlike critical minerals, the U.S. is the largest producer of crude oil and petroleum products in the world. We are also home to the world's largest biofuels industry.[39] Our refineries and petrochemical producers are the most competitive in the world, taking advantage of a sophisticated workforce, low-cost resources, refinery complexity, and scale to compete with even the largest state-owned enterprises in foreign markets. In 2022, the crude oil processed by U.S. refineries was 84 percent sourced from North America. The U.S. produces more crude and refined products than it consumes and became a net exporter of crude and refined petroleum products in late 2019, after being a net exporter of refined products for the past decade.[40] NHTSA's Proposal undervalues the energy security aspects of the domestic petroleum industry, particularly by failing to distinguish between sources of imported crude oil, ignoring that 70 percent and 84 percent of imported and total crude oil, respectively, is sourced from North America. The Proposal also ignores the significant pipeline connectivity between the U.S. and our North American trading partners, as well as the unique configurations of each U.S. refinery. For example, many U.S. refiners take advantage of harder to refine, less expensive heavier crude oils, which are not produced in the U.S. and must be sourced from Canada or other heavy crude producers. U.S. energy leadership means that the energy security impacts of reduced oil imports are not as significant as they historically had been. It also means that reduced U.S. demand for liquid fuels will impact U.S. oil producers as much, if not more so, than existing trading partners.

U.S. refiners are also critical suppliers of fuel to the U.S. military. In the most recent contract year, U.S. refiners provided 750 million gallons of fuel on the West Coast alone, supporting force readiness for conflict in the Pacific. NHTSA did not assess the impact of likely refinery closures on military operations and readiness.

The positive contributions of the domestic petroleum sector on U.S. energy security would have been more apparent if NHTSA had not relied on out-of-date information and flawed assumptions regarding U.S. energy production. In EIA's Annual Energy Outlook (AEO) 2023 released earlier this year, U.S. crude production is higher than 2022, as are U.S. net exports of petroleum products, petroleum consumption is lower and U.S. refining capacity is lower. These changes call into question the validity of NHTSA's estimate of the reduction in U.S. imports of crude oil that result from the Proposed Rule. The EIA confirmed that "total U.S. energy exports in

[37] BLOOMBERGNEF, *Copper Miners Eye M&A as Clean Energy Drives Supply* (Aug. 30, 2022), *available at* https://about.bnef.com/blog/coppers-miners-eye-ma-as-clean-energy-drives-supply-gap/#:~:text=Copper%20demand%20is%20set%20to,and%20difficulty%20developing%20greenfield%20mines.

[38] INTERNATIONAL ENERGY AGENCY, *The Role of Critical Minerals in Clean Energy Transitions* (March 2022), *available at* https://iea.blob.core.windows.net/assets/ffd2a83b-8c30-4e9d-980a-52b6d9a86fdc/TheRoleofCriticalMineralsinCleanEnergyTransitions.pdf [hereinafter IEA Report 2022].

[39] EIA, Energy Kids "Biofuel Basics" available at https://www.eia.gov/kids/energy-sources/biofuels/.

[40] EIA, "Oil imports and petroleum product explained" (Jun. 12, 2023) *available at* https://www.eia.gov/energyexplained/oil-and-petroleu m-products/imports-and-exports.php.

2022 were highest on record" and that "[t]he United States has been an annual net total energy exporter since 2019."[41] More specifically, "[i]n 2022, total petroleum exports were about 9.58 million barrels per day (b/d) and total petroleum imports were about 8.32 million b/d, making the U.S. an annual net total petroleum exporter for the third year in a row."[42] Moreover, "[t]otal petroleum net exports were about 1.26 million b/d in 2022," an increase over 2021, with imports decreasing from 8.47 million b/d to 8.32 million b/d and exports increasing from 8.54 million b/d to 9.58 million b/d.[43]NHTSA makes unsupported and overly simplistic assumptions in its attempt to assess the energy security impacts of the Proposed Rule. NHTSA asserts "[t]he proposed standards would decrease domestic consumption of gasoline, producing a corresponding decrease in the Nation's demand for crude petroleum, a commodity that is traded actively in a worldwide market."[44] NHTSA further asserts that "when U.S. oil consumption is linked to the globalized and tightly interconnected oil market, as it is now, the only means of reducing the exposure of U.S. consumers to global oil shocks is to reduce their oil consumption and the overall oil intensity of the U.S. economy. Thus, the reduction in oil consumption driven by fuel economy standards creates an energy security benefit."[45] This unsupported assumption of an energy security benefit, however, does not adequately consider the significant shift in U.S. energy exports and imports.

NHTSA acknowledges that "the nation now has a capacity to produce gasoline that considerably exceeds its current domestic consumption."[46] NHTSA further states that "this surplus of gasoline appears likely to increase in the coming years, as EIA's AEO 2022 reference case (EIA, 2022) anticipates that domestic gasoline consumption will continue to decline until nearly 2040. Thus, barring significant disinvestment in domestic refinery capacity, the United States projects to remain a net exporter of gasoline through the next several decades."[47] Moreover, NHTSA notes that [t]aken together, the forecasts of declining U.S. gasoline consumption and rising net exports of refined petroleum products reported in AEO 2022 suggest that that EIA expects the U.S. to grow as a net exporter of refined petroleum products—including gasoline—through nearly 2040."[48] Further, NHTSA's analysis "assumes that the anticipated reduction in domestic gasoline consumption is unlikely by itself to significantly affect domestic crude oil production, domestic gasoline refining, or U.S. exports and imports of crude petroleum."[49]

To support its assertion of an energy security benefit, NHTSA relies on its discussion in Chapter 6.2.4.3 of the Draft TSD and specifically that "DOT has elected to assume that changes in oil consumption caused by changes to fuel economy and fuel efficiency standards will have no impact on domestic oil production."[50] It defies reason to conclude that a *de facto* EV mandate will not affect domestic oil production. NHTSA then assumes (wrongly) that "100 percent of any

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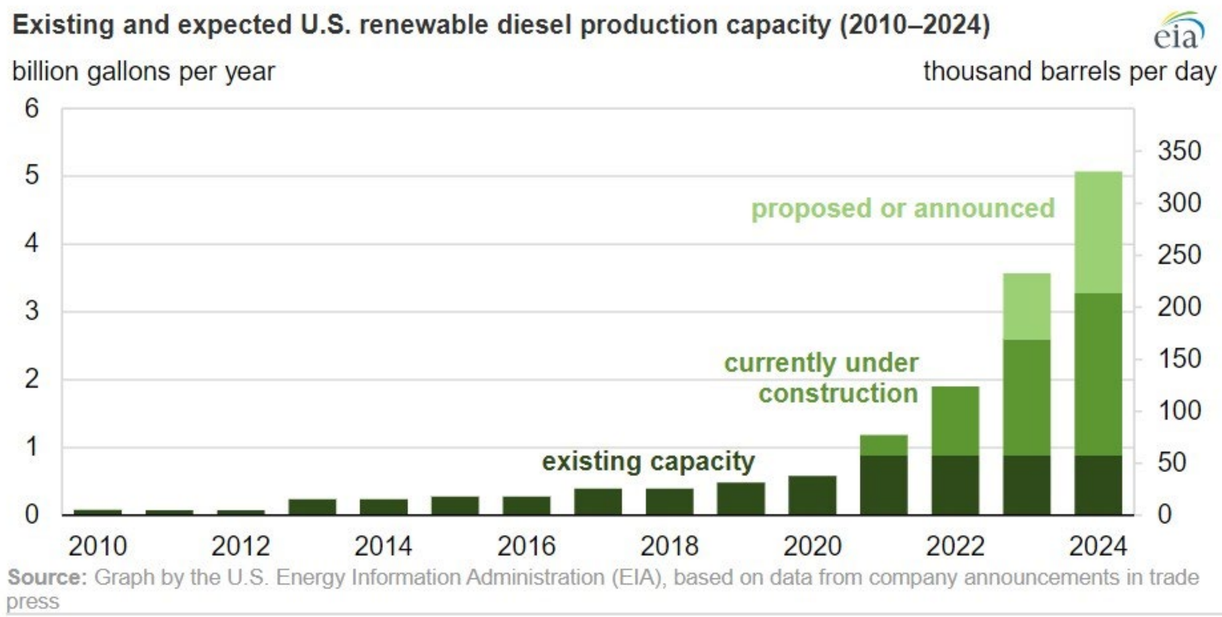
[41] "Oil and petroleum products explained: Oil imports and exports" U.S. Energy Information Administration (EIA), last updated August 9, 2023, available at https://www.eia.gov/energyexplained/oil-and-petroleum-products/imports-and-exports.php.
[42] *Id*.
[43] *Id*.
[44] 88 Fed. Reg. at 56,253.
[45] 88 Fed. Reg. at 56,318.
[46] Draft TSD at 6-46.
[47] Draft TSD at 6-46.
[48] Draft TSD at 6-46–6-47.
[49] Draft TSD at 6-47.
[50] Draft TSD at 6-47.

decrease in fuel consumption attributable to higher CAFE standards will be reflected in lower oil imports."[51]

NHTSA also provides little analysis of the impact of this rule on the U.S. biofuels, renewable fuels, or agricultural industries. The U.S. is the world's largest biofuels producer, yet the PRIA, the Draft TSD, and the Proposed Rule do not even mention renewable fuels. According to the U.S. Energy Information Agency (EIA), the existing US renewable diesel production capacity is expected to double by 2025.[52] Specifically, production capacity will expand from 0.6 billion gallons per year by the end of 2020 to 3 billion gallons by 2024.

**Figure 5: Existing and expected U.S. renewable diesel production capacity (2010-2024)[53]**




Proposed or announced projects could add 1.8 billion gal/y by 2024, bringing US renewable diesel production to a total of 5.1 billion gal/y (330,000 b/d) by the end of 2024.[54] EIA's figures exclude global biofuel production capacity and renewable diesel imports into the United States. The International Energy Agency (IEA) likewise projects the expansion of worldwide biodiesel and hydrotreated vegetable oil production capacity in critical international markets between 2019 and 2025.[55]

[51] Draft TSD at 6-47.
[52] *See* Energy Information Agency (EIA), Domestic renewable diesel capacity could more than double by 2025. February 3, 2023. Retrieved from https://www.eia.gov/todayinenergy/detail.php?id=55399&src=email.
[53] Energy Information Agency, US renewable diesel capacity could increase due to announced and developing projects July 29, 2021. Retrieved from https://www.eia.gov/todayinenergy/detail.php?id=48916
[54] *Id*.
[55] https://www.iea.org/data-and-statistics/charts/biodiesel-and-hvo-production-overview-for-key-globalmarkets-2019-2025.

Despite the significant investment in U.S. and global renewable diesel production capacity to increase renewable diesel production, NHTSA's analysis is devoid of any consideration of the impact of its proposed standards on the biofuel industry. Considering the implications for the renewable fuels industry, as well as the significant impact it will have on the agricultural producers that supply the industry, this glaring omission underscores the arbitrary nature of this rulemaking.

### C. NHTSA should not conflict with Congressional objectives as expressed in the Energy Independence and Security Act and the Renewable Fuel Standard (RFS)

The Proposed Rule stands in direct contrast to other legislation, such as the Renewable Fuel Standard Program ("RFS"), whereby Congress mandated that "gasoline sold or introduced into commerce in the United States" must contain renewable fuels[56] and, in 2022, must include billions of gallons of renewable fuel.[57] Congress demonstrated in the RFS that when it wants to transform the transportation sector, it does so with precision and within the context of a prescribed statutory framework.

#### 1. Proposed CAFE standards for passenger cars and light trucks and fuel efficiency standards for HDPUV discourage development and use of liquid renewable fuels

To reduce carbon emissions and ensure energy security and independence, Congress created the RFS, which requires increasing volumes of renewable fuel to be blended into transportation fuel. The four categories of renewable fuel must emit anywhere from 20 percent to 80 percent fewer GHGs relative to the fossil fuel it replaces. In response to this mandate, U.S. refineries dramatically increased renewable fuel production and invested billions of dollars to expand U.S. production of liquid renewable fuels, which can now achieve 79 to 86 percent GHG emissions reductions as compared to petroleum fuels.[58]One example is renewable diesel that is a "drop-in" fuel and can be used in the existing diesel fuel distribution system and existing diesel vehicles.

According to the Energy Information Agency's June 2023 Short-Term Energy Outlook (STEO), biomass-based diesel (which includes biodiesel and renewable diesel) production averaged 3.1 billion gallons in 2022, and EIA expects production to average 4.0 billion gallons in 2023 and 4.8 billion gallons in 2024. EIA expects ethanol and renewable oxygenate production to increase from 18.4 billion gallons in 2022 to 19.2 billion gallons in 2023, and to 20.4 billion gallons in 2024.

In response to the RFS and other government programs encouraging the production of lower carbon renewable liquid fuels, U.S. refiners are undertaking significant capital expenditures to lower the carbon intensity of fuel such as taking advantage of Congress' 45Q tax credit for carbon capture and sequestration (CCS). Ethanol producers are also looking to use CCS to reduce carbon intensity from the 15 billion gallons of ethanol blended into our nation's gasoline.[59]

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[56] 42 U.S.C. § 7545(o)(2)(A)(i).
[57] *Id.*, § 7545(o)(2)(B); 87 Fed. Reg. 39,600 (July 1, 2022).
[58] Hui Xu, Longwen Ou, Yuan Li, Troy R. Hawkins, and Michael Wang, *Environmental Science & Technology* 2022, *56* (12), 7512-7521. DOI: 10.1021/acs.est.2c00289
[59] Erin Voegele, Carbon America to develop CCS project at Nebraska ethanol plant, Ethanol Producer Magazine, October 4, 2022 (Carbon America announced its third CCS project at a U.S. ethanol plant).

Similarly, renewable diesel and sustainable aviation fuel production capacity will total 5.1 billion gallons per year if all announced expansion projects, which represent $10.8 billion in investments, are completed.[60]

**2. NHTSA should not discourage the continued decarbonization of fuels**

Lifecycle assessments (LCAs) of GHG emissions from ICEVs reveal that 73 percent of lifecycle GHG emissions come from fuel combustion.[61] By comparison, lifecycle emissions from EVs occur not from fuel combustion from the vehicle, but from fuel use and various energy and material inputs upstream from the vehicle. NHTSA fails to consider that reducing the carbon intensity of liquid fuels used in ICEVs and ignoring the carbon intensity of EVs is arbitrary and capricious. It results in a highly flawed assessment of emissions.

The IEA forecasts a foundational role for refined petroleum products and liquid fuels in the coming decades, even as the global energy sector evolves.[62] The key to meeting global demand is to utilize the most efficient assets, find low-cost methods to abate carbon emissions, and utilize the expertise of the U.S. refining and petrochemical sectors in scaling energy technology. The U.S. refining and petrochemical industries are well positioned to lead the world in scaling CCS cost-effectively and utilizing clean hydrogen as part of the refining process. The 45Q tax credit in the IRA – a tax credit for stored and utilized $CO_2$ – and the $12 billion in federal funding to support U.S. carbon management has the potential to remove hundreds of millions of tons of $CO_2$ each year.[63] Similarly, the IRA's 45V hydrogen production tax credit awards up to $3 per kilogram if hydrogen is produced for projects lowering GHG carbon intensity. Several U.S. refiners are investing in low-carbon hydrogen production that can lower the carbon intensity of production and fuel transportation vehicles.

The competitiveness of the U.S. refining industry is critical in maintaining our energy security and NHTSA standards that arbitrarily shift transportation energy use from liquid fuels to electricity unnecessarily harm our energy security and limit opportunities to reduce carbon emissions.

## III. THE PROPOSED CAFE STANDARDS FOR PASSENGER CARS AND LIGHT-DUTY-TRUCKS ARE UNLAWFUL

NHTSA's proposed standards for passenger cars and light-duty trucks go beyond NHTSA's statutory authority and establish standards that are neither achievable nor feasible for the industry. In proposing these unachievable standards, NHTSA ignored plain statutory language prohibiting it from considering EVs when determining maximum feasible fuel economy. Moreover, NHTSA failed to adequately weigh the four factors set forth in EPCA: technological feasibility,

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[60] EIA, U.S. renewable diesel capacity could increase due to announced and developing projects, Today in Energy, July 29, 2021. Retrieved at https://www.eia.gov/todayinenergy/detail.php?id=48916
[61] Decarbonizing Combustion Vehicles – A Critical Part in Reducing Transportation Emissions - Transportation Energy Institute.
[62] See Marathon Petroleum Corporation, Perspectives on Climate-Related Scenarios (June 2021), at 1, available at 2021-MPC-MPLXClimateReport.pdf (marathonpetroleum.com).
[63] Department of Energy, The Pathway to: Carbon Management Commercial Liftoff, undated. Accessed Carbon Management - Pathways to Commercial Liftoff (energy.gov)https://liftoff.energy.gov/carbon-management/.

economic practicability, the effect of other motor vehicle standards of the Government on fuel economy, and the need of the United States to conserve energy.

### A. NHTSA is prohibited from considering the fuel economy of electric vehicles when determining the maximum feasible fuel economy standards for passenger cars and light-duty trucks

EPCA expressly provides that NHTSA "may not consider" the fuel economy of electric vehicles and dual-fueled vehicles, in setting fuel-economy standards for passenger cars.[64] Section 32902(h)(1)'s text is plain: it provides that in "carrying out" the responsibility to set fuel-economy standards, NHTSA "may not consider" the fuel economy of electric vehicles.[65] Moreover, NHTSA cannot consider the fuel economy of PHEVs when operated on electricity.[66] Congress included this explicit prohibition to ensure that electric vehicles remain the compliance flexibility that Congress intended them to be—and do not become a technology-forcing regulatory mandate. The Act does not define "consider," so that word must be "interpreted as taking [its] ordinary, contemporary, common meaning at the time Congress enacted the statute."[67] In 1988, as today, to consider meant to "take into account."[68] So Section 32902(h)(1) bars NHTSA from taking into account electric vehicles' fuel economy in setting standards.

NHTSA seeks to evade EPCA's clear statutory prohibition by introducing extratextual exceptions to its reach. Specifically, the agency interprets 49 USC § 32902(h) as "preventing NHTSA from setting CAFE standards that effectively require additional application of dedicated alternative fueled vehicles in response to those standards, not as preventing NHTSA from being aware of the existence of dedicated alternative fueled vehicles that are already being produced for other reasons besides CAFE standards."[69] NHTSA further asserts that "Modeling the application of BEV technology in MYs outside the standard-setting years allows NHTSA to account for BEVs that manufacturers may produce for reasons other than the CAFE standards, without accounting for those BEVs that would be produced because of the CAFE standards."[70] This reading conflicts with the unambiguous statutory text and would defeat Congress's intent to ensure that electric vehicles remain an option for compliance flexibility and do not become a regulatory mandate.

Despite that clear prohibition, NHTSA openly considered electric vehicles—including those currently in the fleet and EVs the agency predicted would be produced in response to California's and other States' zero-emission-vehicle mandates and EPA's prior greenhouse-gas

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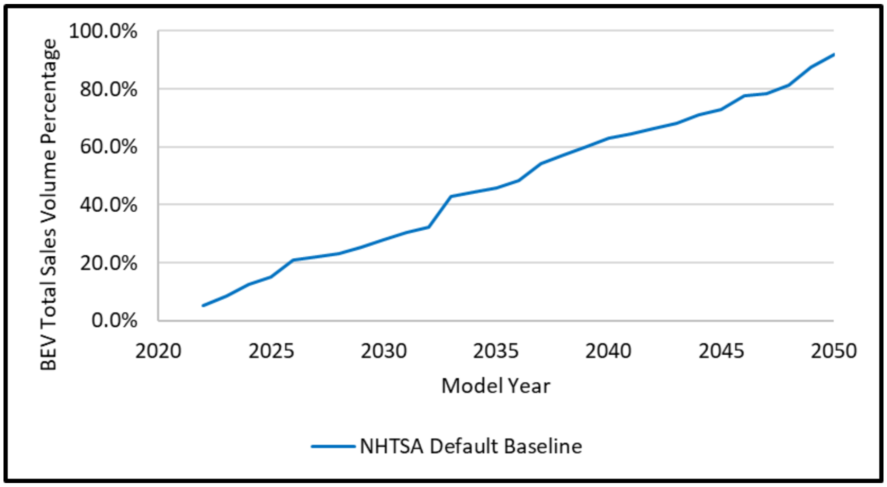
[64] 49 U.S.C. § 32902(h)(1) and 32902(h)(2) (NHTSA shall consider dual-fueled vehicles, such as PHEVs "to be operated only on gasoline or diesel fuel.").
[65] 49 U.S.C. § 32902(h)(1).
[66] 49 U.S.C. § 32902(h)(2).
[67] *Guedes v. Bureau of Alcohol, Tobacco, Firearms & Explosives*, 45 F.4th 306, 315 n.3 (D.C. Cir. 2022).
[68] American Heritage Dictionary 313 (2d ed. 1985); *see also* Random House Dictionary of the English Language 434 (2d ed. 1987) ("to think carefully about, esp. in order to make a decision"); Funk & Wagnalls New International Dictionary of the English Language 287 (1984) (to "make allowance for"); Black's Law Dictionary 306 (6th ed. 1990) (to "give heed to").
[69] *Id.*
[70] *Id.*

standards—in deciding the maximum fuel-economy level that automakers can feasibly achieve.[71] As proposed, the standards are not feasibly achievable by ICEVs and as demonstrated in Figure 6 below, effectively establish an electric vehicle mandate.

**Figure 6: NHTSA Baseline BEV Assumptions[72]**




The statutory directive includes no qualifications or carveouts. Instead, Congress used mandatory language: "may not consider."[73] Such language "indicates a command that admits of no discretion on the part of the person instructed to carry out the directive."[74] In other words, Congress forbade NHTSA to account for the fuel economy of any electric vehicle, from any model year, for any purpose when setting fuel-economy standards. No exceptions—full stop.[75]

NHTSA's contrary reading improperly adds words to the statute that distort its meaning. In effect, NHTSA reads Section 32902(h)(1) as if it provided that NHTSA "may not consider" the fuel economy of electric vehicles unless the electric vehicles are not produced solely to comply with NHTSA's standards in the model years at issue in the rulemaking (i.e., the "standard setting years"). That is, NHTSA believes that it may consider the fuel economy of some electric vehicles, so long as its standards are not forcing the manufacture of those vehicles in the model years covered by its rule. But "[t]he subsection's text contains no limiting term that restricts its reach" in this way.[76] And NHTSA is not free to "supply words ... that have been omitted."[77] "By introducing

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[71] "NHTSA has not taken the additional step of removing BEVs from the baseline fleet, and we continue to assume that manufacturers will meet their California ZEV obligations whether or not NHTSA sets new CAFE standards. We reflect those manufacturer efforts in the baseline fleet." 88 Fed. Reg. 56,319.
[72] Trinity Consultants, Review of NHTSA's Proposed CAFE Standards for Mys 2027-2032 Passenger Cars and Light Trucks and Fuel Efficiency Standards for MYs 2030-2035 Heavy-Duty Pickup Trucks and Vans. October 16, 2023. Hereinafter "Trinity Technical Review." and included as Appendix B.
[73] *See United States v. Palomar-Santiago*, 141 S. Ct. 1615, 1620-21 (2021) ("may not" is "mandatory language").
[74] *Ass'n of Civilian Technicians, Mont. Air Chapter No. 29 v. FLRA*, 22 F.3d 1150, 1153 (D.C. Cir. 1994).
[75] *See Freytag v. Comm'r*, 501 U.S. 868, 874 (1991) ("[C]ourts 'are not at liberty to create an exception where Congress has declined to do so.'" (quoting *Hallstrom v. Tillamook Cnty.*, 493 U.S. 20, 27 (1989))).
[76] *Id.* at 873-84.
[77] Antonin Scalia & Bryan Garner, Reading Law: The Interpretation of Legal Texts 93 (2012); *see Bates v. United States*, 522 U.S. 23, 29 (1997) ("[W]e ordinarily resist reading words or elements into a statute that do not appear on its face.").

a limitation not found in the statute," NHTSA "alter[s], rather than ... interpret[s]" Section 32902(h)(1).[78] However, for reasons that are utterly opaque and contrary to its stated reason for including EVs in the baseline, NHTSA complies with Section 32902(h)(2)'s matching requirement by considering dual-fueled vehicles (e.g., plug-in hybrid electric vehicles or (PHEVs)) to operate *only* on gasoline or diesel fuel and *excluded* from the baseline the electric portion of PHEV operation. There is absolutely no reason why NHTSA should apply Section 32902(h)(1) differently than Section 32902(h)(2) as both contain unambiguous directives to exclude vehicles running on electricity from the baseline.

NHTSA chiefly argued that it must consider EVs in order to develop a baseline "that represents the world in the absence of further regulatory action" and to ignore them would create an "artificial baseline that pretends that dedicated alternative fueled vehicles do not exist."[79] NHTSA relies on "OMB Circular A-4"—a regulatory guidance document that does not distinguish among specific agencies—to support this proposition.[80] This argument is wrong from beginning to end, as the Circular never condoned a baseline contrary to the law.

To begin with, it ignores that NHTSA did not consider only the fuel economy of electric vehicles in the "analytical baseline" that supposedly reflects the "reality" that would exist regardless of whether NHTSA increased the standards. That is unlawful on its own—but NHTSA also included in the model the fuel economy of additional electric vehicles that manufacturers would introduce, irrespective of the CAFE standard, during the standard setting years MY2027-2032. NHTSA's argument also ignores that the "analytical baseline" does not reflect "reality" for all manufacturers. A baseline that includes the electric vehicles of manufacturers that chose to use them as a compliance mechanism or to cater to a particular type of consumer does not reflect the "reality" of manufacturers that chose different compliance options and focused on different market segments.

Likewise, NHTSA relies on ZEV penetration rates pursuant to California's Advanced Clean Cars II ("ACC II") rulemaking in both the baseline and standard setting years. As discussed in Sections III.A.2 and III.A.3 below, elimination of EVs resulting from the ACC II regulations, which have yet to receive EPA approval, considerably reduced the fuel economy of the light-duty fleet. However, many automakers will likely not meet the ACC II ZEV penetration rates and will instead rely on credits or payment of fines to comply with CAFE within the timeframe of the Proposal. These unrealistic and unsubstantiated electric vehicle penetration rates do not reflect the "reality" of the industry.

In all events—to state the obvious—an Office of Management and Budget Circular cannot trump a statute. Whenever Congress directs an agency not to consider a certain factor, it is presumably requiring the agency to exclude an aspect of "reality" from its analysis—if the factor were not "real," there would be no need to direct the agency to disregard it. Congress may have

[78] *Little Sisters of the Poor Saints Peter & Paul Home v. Pennsylvania*, 140 S. Ct. 2367, 2381 (2020).
[79] 88 Fed. Reg. 56,319.
[80] *Id.*

good reasons for deciding that a factor that is "real" nevertheless is not relevant to the task at hand.[81]

That is precisely what Congress did here when, to protect the incentives it created, Congress decided that NHTSA "may not consider the fuel economy of dedicated automobiles."[82] It in no way defies "reality" to require NHTSA to continue setting fuel-economy standards based on what is achievable for ICEVs, while creating incentives for alternative-fuel vehicles. NHTSA may not like that policy choice, but it "may not rewrite clear statutory terms to suit its own sense of how the statute should operate."[83] Section 32902(h)(1) reflects a congressional judgment that the Act should give manufacturers the flexibility and incentive to produce alternative-fuel vehicles, but should not impose a de facto mandate by setting standards that presume that manufacturers will produce those vehicles. That judgment was "hardly irrational."[84] NHTSA may prefer a different policy that allows it to pursue its electrification goal, but "[i]f policy considerations suggest that the current scheme should be altered, Congress must be the one to do it."[85]

**1. NHTSA improperly included EVs in the baseline and standard modeling.**

When NHTSA considered the statutory factors set forth in Section 32902(f), it repeatedly relied on the modeling results of a fleet that included EVs. NHTSA did not explain why it would have (or reasonably could have) found that the proposed standards are the maximum feasible standards that manufacturers can achieve in model years 2027-2032 without EVs, as Section 32902(h)(1) requires. Nor did it provide any modeling to show how a fleet could comply with the final standards without any EVs and the high imputed fuel economy they contribute to the average fuel economy of the fleet.

In developing the baseline calculation and modeling for the Proposed Rule, NHTSA improperly considered the fuel economy of EVs.[86] This results in an inflated baseline and No Action scenario that ripples through to inappropriately inflate the alternatives evaluated and proposed standards. NHTSA's baseline calculation is premised on unrealistic and unsubstantiated assumptions regarding ZEV penetration rates, thereby causing the proposed standards in years following the baseline to carry through these faulty assumptions. NHTSA's reliance on this prohibited factor makes compliance with the proposed standards appear more technologically feasible and economically practicable than it actually is. In doing so, NHTSA violated Section 32902(h)(1).

Trinity Consultants evaluated the impact of eliminating ZEVs in CAFE modeling.[87] As shown in the figures below, the baseline fleet fuel economy (passenger and light truck) is

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[81] *See*, *e.g.*, 49 U.S.C. § 41734(h) (directing Secretary of Transportation to determine "basic essential air service" without considering "slot availability" at high-density airports); 42 U.S.C. § 300gg-111(c)(5)(D) (directing arbitrators not to consider certain prices in determining reimbursement rates for healthcare services); 16 U.S.C. § 808(d)(1) (directing the Federal Energy Regulatory Commission not to consider adequacy of transmission facilities).
[82] 49 U.S.C. § 32902(h)(1).
[83] *Util. Air Regul. Grp. v. EPA*, 573 U.S. 302, 328 (2014).
[84] *See Landstar Express Am. v. Fed. Mar. Comm'n*, 569 F.3d 493, 499 (D.C. Cir. 2009) (Kavanaugh, J.).
[85] *Intel Corp. Inv. Policy Comm. v. Sulyma*, 140 S. Ct. 768, 778 (2020).
[86] TSD at 3-65 to 3-84.
[87] Appendix B Trinity Technical Review at 4.

dramatically lower than the NTHSA baseline when ZEVs are excluded. The exclusion of ZEVs from the baseline would have resulted in substantially lower fuel economy than the proposed CAFE standards.

**Figure 7: Impact of Eliminating ZEVs on NHTSA's Baseline Fleet Fuel Economy – 2027 to 2032**

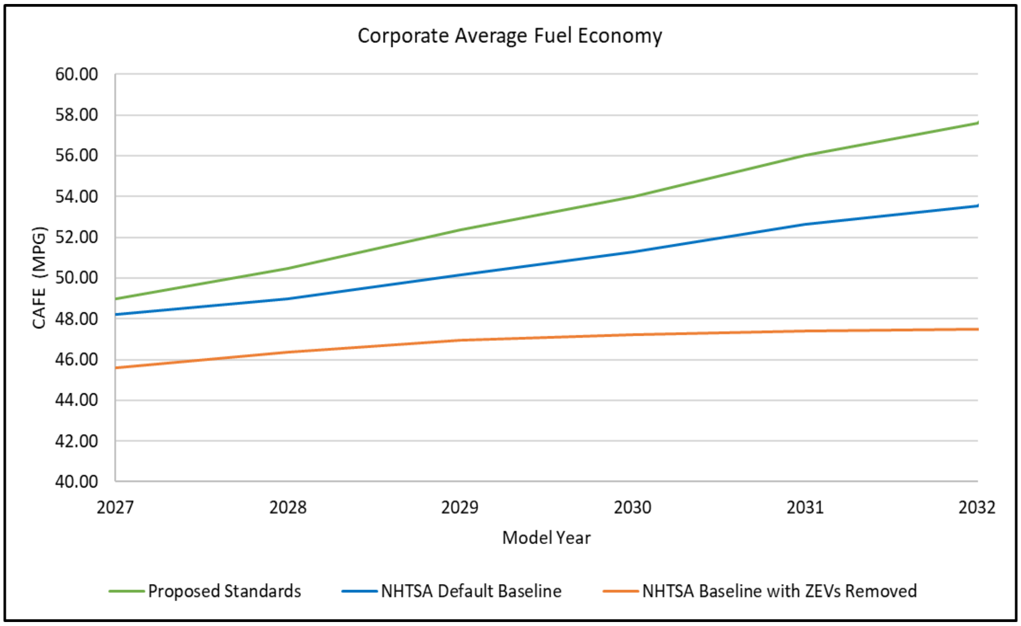
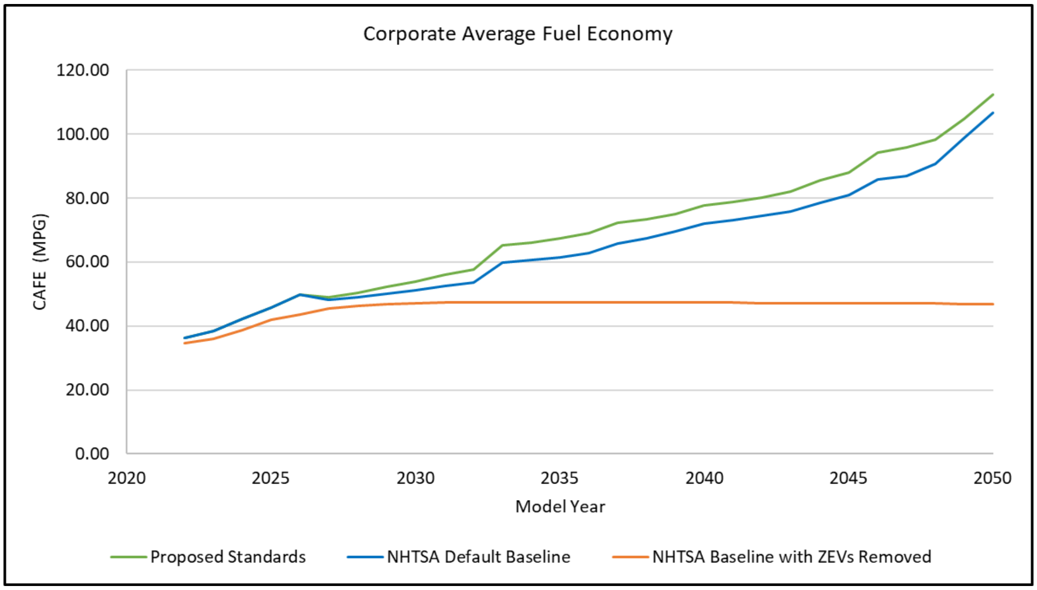



Figure 8 below shows the same data as above and extended to 2050. As Trinity Consultants points out, the modeled reduction in the rate of light duty fuel economy in 2027 to 2032 "implies that there doesn't appear to be a real need for the proposed CAFE standards as the fuel economy of the light-duty fleet is forecast to skyrocket post 2032 based on the assumptions NTHSA has incorporated into the CAFE model."[88]

[88] *Ibid.*

**Figure 8: Impact of Eliminating ZEVs on NHTSA's Baseline Fleet Fuel Economy – 2022 to 2050**




NHTSA's proposed fuel-economy standards are based on a projected baseline fleet that includes EVs that NHTSA predicted automakers would produce even if NHTSA did not impose more stringent fuel economy standards in model years 2027-2032. Specifically, NHTSA's No Action Alternative assumes:

- The existing national CAFE and GHG standards are met, and that the CAFE and GHG standards for MY 2026 finalized in 2022 continue in perpetuity
- Manufacturers who committed to the California Framework Agreements met their contractual obligations for MY 2022
- The HDPUV MY 2027 standards finalized in the Phase 2 program continue in perpetuity
- Manufacturers will comply with the ZEV/ACC2/ACT standards that California has adopted, and other states have agreed to follow through 2035
- Manufacturers will make production decisions in response to estimated market demand for fuel economy or fuel efficiency, considering estimated fuel prices, estimated product development cadence, the estimated availability, applicability, cost, and effectiveness of fuel-saving technologies, and available tax credits
- NHTSA's estimates of ways that each manufacturer could introduce new PHEVs and BEVs in response to state ZEV mandates.[89]

In each case, NHTSA violated section 32902(h)(1)'s unambiguous command not to "consider the fuel economy" of electric vehicles when setting fuel-economy standards for

[89] 88 Fed. Reg. 56,259.

passenger cars and light-duty trucks. In practice, this results in proposed standards that simply cannot be achieved without the use of EVs.

### 2. NHTSA's ZEV penetration assumptions in the baseline and standard modeling are overly optimistic.

Even if NHTSA were permitted to consider EVs in its analysis (which it is clearly statutorily prohibited from doing), its assumptions are not realistic. NHTSA's assumption that automakers will comply with existing Federal CAFE and GHG standards as well as California's aggressive ACC II and ACT standards are unrealistic. Manufacturers have already indicated that compliance with these programs is challenging and, for many, unlikely.[90] Many manufacturers will have to rely on compliance flexibilities, such as the use of credits, or the payment of civil penalties.

In particular, NHTSA's assumptions regarding ZEV penetration rates stemming from California's ZEV regulations and adoption by Section 177 states are faulty and misplaced. NHTSA considered California's ACC I (LD ZEV requirements through MY 2025), ACC II (LD ZEV requirements from MYs 2026-2035), and Advanced Clean Trucks (ACT) (trucks in classes 2b through 8 for MYs 2024-2035) in the modeling analysis of compliance pathways. Without any apparent consideration of compliance data, NHTSA asserts it is "confident" that "manufacturers will comply with the ZEV programs because they have complied with state ZEV programs in the past and they have made announcements of new ZEVs demonstrating an intent to comply with the requirements going forward."[91] Additionally, NHTSA argues that modeling compliance with these programs accounts for "technology improvements that manufacturers would make even in the absence of CAFE standards", which "allows NHTSA to gain a more accurate understanding of the effects of the proposed rulemaking."[92] However, these compliance considerations are unrealistic and overly optimistic.[93]

As a threshold issue, ACC I, ACC II, and ACT are preempted by federal law. EPCA preempts states from adopting or enforcing any regulation "related to" fuel-economy standards, regardless of any accompanying localized pollution benefits. This provision is self-executing, meaning no agency action is necessary for it to be effective. Moreover, Congress did not authorize NHTSA or EPA to waive this preemption provision. ACC I and ACC II are clearly related to fuel-economy standards. Courts have found that state regulations "relate [] to" federal matters when they have a "connection with" or contain a "reference to" these matters.[94] Indeed, because carbon dioxide emissions are "essentially constant per gallon combusted of a given type of fuel," the fuel

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[90] Alliance for Automotive Innovation, Comments to the Environmental Protection Agency, Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles, Proposed Rule, Docket No. EPA-HQ-OAR-2022-0829 (hereinafter AAI Comments) at 1-60, and 66-70.

[91] 88 Fed. Reg. at 56,176.

[92] *Id.*

[93] NHTSA similarly chose to account for the Department of Energy's ("DOE") proposed new petroleum equivalency factor ("PEF") in its calculations for the Proposed Rule. Under DOE's proposal, the fuel economy value of electric vehicles would be significantly less when using the proposed new PEF than the value achieved under the current/existing PEF. By accounting for the current/existing PEF in the baseline calculation (which gives a significantly higher fuel economy value to electric vehicles) but using the new proposed PEF beginning in MY 27 during the standard setting years, NHTSA inflates the baseline fuel economy value from which the proposed standards are developed. This effectively makes NHTSA's proposed standard appear more technologically feasible than it actually is.

[94] *See e.g.*, *California Restaurant Association v. City of Berkeley*, (9th Cir. April 17, 2023).

economy of a vehicle and its carbon-dioxide emissions are two sides of the same coin.[95] Accordingly, "any rule that limits tailpipe [greenhouse gas] emissions is effectively identical to a rule that limits fuel consumption."[96] Any proposed rule establishing ZEV mandates (and thus de facto average fuel economy standards) impedes NHTSA's ability to establish fuel economy standards that satisfy EPCA's requirements.[97]

ACC I and ACC II are also expressly preempted by the Clean Air Act (CAA), which provides that "No State or any political subdivision thereof shall adopt or attempt to enforce any standard relating to the control of emissions from new motor vehicles . . . ."[98] Unlike EPCA, EPA may grant California a preemption waiver under the CAA under certain conditions.[99] Before a waiver can be granted, the CAA requires EPA to evaluate California's waiver request to ensure that California did not arbitrarily determine that it needs "ZEV mandates" to address compelling and extraordinary circumstances.[100] ACC I is subject to an active legal challenge pending before the D.C. Circuit,[101] and EPA has not determined whether it will grant a waiver for ACC II; therefore NHTSA cannot rely on ACC II in the development of its baseline or proposed standards. Moreover, because California concedes that ACC II will not meaningfully address the impacts of climate change in California and ACC II will slow fleet turnover and retard California's progress toward meeting the NAAQS, California cannot demonstrate that it "needs" the waiver and ACC II is therefore preempted. NTHSA's reliance on ACC II in its analysis and standard setting is pre-decisional and inappropriate.

Even if NHTSA were permitted to rely on ZEV penetration assumptions from California's ZEV mandates, NHTSA's compliance assumptions are faulty. NHTSA asserts that "[t]he CAFE Model brings manufacturers into compliance with ACC II and ACT first in the baseline, solving for the technology compliance pathway used to meet increasing ZEV standards."[102] Further, NHTSA "did not assume compliance with ZEV requirements through banking of credits when simulating the program in the CAFE Model and focus instead on simulating manufacturer's compliance fully through the production of new ZEVs."[103] These assumptions are simply unrealistic – automakers have already indicated that the penetration rates required under these programs are unachievable. Many automakers will rely on the use of credits in their compliance planning, and many may also be forced to pay penalties for non-compliance in years where ZEV penetration rates are not met, and credits are unavailable or too expensive. NHTSA concedes in the proposal: "while it looks like manufacturers are falling short of required fuel economy levels in the light truck fleet (and choosing instead to pay civil penalties), NHTSA notes that this appears to be the result of a relatively small number of companies, which affects the overall average achieved levels.[104]

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[95] 75 Fed. Reg. at 25,324, 25327 (May 7, 2010).
[96] *Delta Constr. Co. v. EPA*, 783 F.3d 1291, 1294 (D.C. Cir. 2015).
[97] See AFPM Comments to EPA Notice of Proposed Rulemaking: Multi-Pollutant Emissions Standards for Model Year 2027 and Later Light-Duty and Medium-Duty Vehicles, EPA-HQ-OAR-2022-0829-0714 at 25.
[98] 49 U.S.C. § 7543(a).
[99] *Id. at* § 7543(b).
[100] 42 U.S.C. 7543(b)(1)(B).
[101] *Ohio v. EPA*, D.C. Cir. No. 22-1081.
[102] 88 Fed. Reg. 56,176
[103] *Id.*
[104] EPCA requires NHTSA to set standards at a "maximum feasible" level based on four underlying statutory factors. NHTSA's acknowledgement that manufacturers inability to meet the standards based on technological improvements to vehicles' liquid fuel economy and NHTSA's own predicted compliance

The agency's overall assessment is that the light truck standards are maximum feasible even though they may be challenging for some individual companies to achieve."[105] NHTSA admits it considered the use of credits as a compliance pathway in its modeling for prior rulemakings, but declines to do so here simply because of the "complicated nature of accounting for the entire credit program."[106] NHTSA cannot ignore this viable and necessary compliance pathway simply because it is complicated. Nor can it ignore the reality that many automakers may simply be unable to comply with the ZEV penetration requirements of these programs, even with the credit compliance pathway available, which is itself evidence the standards are infeasible.

NHTSA also makes factually inaccurate assumptions about the number of states that have adopted or are planning on adopting California's ZEV programs. For "ease of modeling", NHTSA incorrectly includes "every state that officially committed to adopting the requirements by the start of December 2022 (regardless of MY start date) . . . as being part of the unified ACC II states group . . . ."[107] Additionally, NHTSA "consider[s] all ACC II states together and do[es] not model specific states' years of joining."[108] NHTSA falsely assumes that 17 states have adopted the California ZEV mandate and models compliance of all 17 states with the ZEV mandate for every year of its compliance modeling.[109] However, NHTSA overestimates the states that have actually adopted ACC II[110] and does not accurately account for states that have indicated they will adopt the program for only portions of the relevant program period. As a threshold issue, these assumptions should not be necessary in NHTSA's rulemaking in the first place, considering NHTSA's statutory prohibition from considering such vehicles. However, if NHTSA nonetheless considers EVs it must do so carefully and accurately. NHTSA instead adds an inflated assumption of 177 states (e.g., Pennsylvania has not adopted the ZEV mandate provisions on ACC I, and has not publicly indicated any plans to adopt ACC II) on top of an already inflated assumption that these penetration rates will be met without the use of any flexibilities, including credit banking and trading. These assumptions are inaccurate, and only serve to make NHTSA's proposed standards look feasible when they truly are not.

### 3. Removing the improperly included ZEVs from NHTSA's baseline and standard setting years renders NHTSA's Proposal infeasible.

NHTSA's inclusion of EVs in both the baseline and the standard-setting years is critical to its determination regarding whether the proposed standards are feasible or not. Without the inclusion of EVs in the baseline and standard setting analysis, it is all but certain that NTHSA would find a lower proposed standard is the maximum feasible. Indeed, even with significant levels of ZEV penetration assumed, NHTSA's Compliance Report indicates a majority of automakers will not be able to comply with NHTSA's proposal.

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challenges that will lead to civil penalties that will increase vehicle prices demonstrate that the proposed rule exceeds the maximum feasible standard requirement set forth in EPCA.

[105] 88 Fed. Reg. 56,137.

[106] *Id.*

[107] 88 Fed. Reg. 56,177.

[108] *Id.*

[109] 88 Fed. Reg. at 56,177, n.153.

[110] NHTSA incorrectly assumes that an additional sixteen (16) Section 177 states will implement ACC II—when some states, including Virginia and Pennsylvania, have not initiated a rulemaking process to adopt the standard.

As reflected in Figure 7 and Figure 8 above and discussed in Section III.A.1, removing ZEVs from NHTSA's baseline and standard setting years results in a substantially lower baseline fleet fuel economy. Moreover, using the statutorily compliant lower baseline results in a substantially larger required fuel economy increase to achieve NHTSA's proposed CAFE standards. Using the statutorily compliant "no-ZEV" baseline resulting in the substantially larger required fuel economy increase renders NHTSA's proposed standards infeasible and undermines NHTSA's determination that its proposed standards are the "maximum feasible."[111]

The impracticability of NHTSA's proposed standards is further reflected in Figure 9 below, showing the number of manufacturers estimated to be able to comply with the proposed standards in 2027-2032 when ZEVs are removed from the baseline and standard setting years. An analysis of the substantial fuel economy increase required to achieve the Proposed Rule when a statutorily compliant "no-ZEV" baseline is used, reveals that only one manufacturer would be able to comply with NHTSA's proposed CAFE standards in 2027-2032.[112]

### B. The proposed standards are unachievable and do not establish the maximum feasible average fuel economy

In determining what level of average fuel economy is the "maximum feasible," there are certain factors NHTSA "shall consider" and other factors NHTSA "may not consider." NHTSA "shall consider": (i) "technological feasibility," (ii) "economic practicability," (iii) "the effect of other motor vehicle standards of the Government on fuel economy," and (iv) "the need of the United States to conserve energy."[113] As described in more detail below, NHTSA has not properly considered these statutorily prescribed factors. By increasing standards beyond the capabilities of the fleet of internal combustion engines demanded by consumers, NHTSA departs from Congressional intent to set maximum feasible fuel economy standards based on the statutory factors set forth in EPCA. This results in a Proposal that is misaligned with reality. The Proposed Rule amounts to a *de facto* electric vehicle mandate, ultimately requiring automakers to drastically transition their fleets from ICEVs to EVs in the MY27–32 timeframe without demonstrating that such a transition is feasible.

NHTSA's Proposal goes well beyond not only its statutory authority but also beyond reason and logic. The Proposed Rule increases reliance on imported critical minerals and metals for battery production and grid expansion that could have serious negative consequences for our energy and national security. The supply chain for key minerals needed to produce electric vehicle batteries is not assured and will require dramatic increases to meet expected demand. The extraction and processing of battery critical minerals is concentrated in politically unstable or unfriendly nations. Domestic copper and aluminum smelting capacity is insufficient to meet grid expansion needs, and new mines can take over a decade to increase domestic supply. The deployment timeline necessary to develop new resources for batteries and the grid is impracticable and presents unnecessary risks to our energy and economic security. In contrast, domestically consumed liquid fuels sourced from petroleum and bio feedstocks are largely sourced in North America, and the U.S. benefits from its position as a net exporter of petroleum

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[111] Appendix B Trinity Technical Review at 4.
[112] Appendix B Trinity Technical Review at 5. Trinity notes that two manufacturers are excluded from its count of non-compliant manufacturers given that they exclusively sell electric vehicles and thus have zero sales in the no-ZEV case.
[113] 49 U.S.C. § 32902(f).

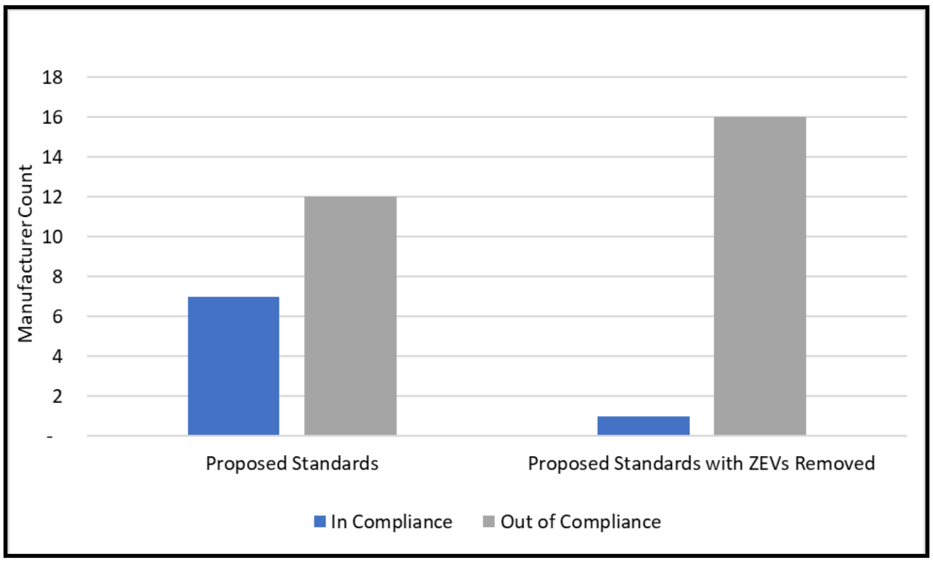
and refined product exports. Moreover, the Proposed Rule would serve to further increase vehicle costs and reduce consumer choice. In sum, NHTSA consistently skews its analysis in favor of its preferred technology—EVs, effectively ignoring or downplaying the significant associated costs and challenges.

### 1. The proposed standards are not technologically feasible

NHTSA failed to demonstrate that production of EVs at the assumed penetration rates in the timeline of the Proposed Rule is technologically feasible. NHTSA's online data portal for CAFE compliance data shows several major automakers with negative credit balances as of 2017 reporting data, with significantly greater shortfalls predicted for 2019.[114] This data shows that even under less stringent standards, automakers were unable to comply without relying upon credits. Manufacturers are struggling to meet existing standards, and NHTSA has not demonstrated they can meet more stringent standards.

Using the CAFE model, Trinity Consultants evaluated the number of auto manufacturers projected to be compliant with the proposed standards.[115] As Figure 9 below shows, a significant majority of automakers will be out of compliance, and if ZEV assumptions are removed, only a single manufacturer would meet the proposed standards.

**Figure 9: Regulatory Compliance Manufacturer Counts from the NTHSA and No-ZEV Baselines During the Standard Setting Years**




NHTSA's analysis fails to address the lack of sufficient critical minerals needed to produce EV batteries and expand the electrical grid and charging infrastructure in the timeline of the Proposed Rule. EV production simply cannot achieve the assumed levels given the current material and supply chain constraints, which are unlikely to abate during the standard setting years. Further, the infrastructure necessary to operate such vehicles is critically important to increased EV adoption. NTHSA overlooks this issue in the Proposed Rule. NHTSA fails to demonstrate that sufficient charging stations, utilities, and other infrastructure needed to support

[114] NHTSA, MY 2011-2019 Credit Shortfall Report, October 15, 2019.
[115] Appendix B Trinity Technical Review at 6.

accelerated EV implementation will be available by the time of the Proposed Rule. As engine manufacturers have acknowledged, even as new EVs are ready to enter into production, the necessary infrastructure for electric vehicles continue to lag, especially when multiple facilities are needed to support these different fuel and powertrain technologies.[116] NHTSA has not adequately evaluated or grasped the time and resources required to permit, construct, and operate the necessary infrastructure to power these vehicles. This is particularly concerning in light of the very real risk that the electric grid will not be able to meet the increased demand anticipated by the Proposed Rule.[117]

**a) Scarce supplies of critical minerals will prevent sufficient production of EV batteries to meet this EV mandate.**

NHTSA relies on unsubstantiated and unrealistic EV penetration rates in its baseline calculation and modeling. In doing so, NHTSA fails to fully account for the challenges associated with creating and sustaining a viable domestic supply chain that can deliver the production-ready batteries necessary to meet the assumed pace of electrification. In fact, insufficient mineral availability, processing and manufacturing, and overall costs pose significant, if not insurmountable, impediments to a viable domestic supply chain.

Current domestic production of critical minerals required for battery production is insufficient to meet the projected demands. According to a review of multiple sources, there is a six-fold demand growth expectation by 2030 and approximately 15 times by 2040. This growth rate outpaces the market's ability to supply such minerals. These minerals are not available today, mining capacity cannot be increased as quickly as required to meet the assumed rate of production, and at-scale recycling capabilities will not be available in the foreseeable future. As described in Section III.B.1.d.i, development and expansion of mining and processing projects take years to become operational, if they even make it to that point. Just this past April, the United States' first and only cobalt plant decided to halt construction at the Idaho Cobalt Operations mine due to low cobalt prices, inflation, and the mine's remote location despite Jervois's beneficial support from federal grants—including a not-yet-approved $15 million award from the U.S. Department of Defense—for additional drilling and to pay for studies to assess the possibility of constructing a cobalt refinery in the U.S.[118]

Improvements in recycling rates and enhancing recovery technologies at mines will not be available in time to reduce the need to develop new sources of critical minerals. Recycling technologies for EV batteries remain nascent and cannot scale at a rate fast enough to alleviate supply shortages within the timeframe of the Proposed Rule. Moreover, even if those technologies

[116] *See* Jack Roberts, Truck Tech, "5 Takeaways from ACT Expo 2020," (May 20, 2022), *available at* https://www.truckinginfo.com/10172184/5-take-aways-from-act-expo-2022 (citing Cummins CEO Tom Linebarger as warning ACT Expo attendees that the undertaking will cost multiple trillions of dollars to accomplish).

[117] North American Electric Reliability Corporation, *2022 Long-Term Reliability Assessment* (Dec. 2022), 21, *available at* https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_LTRA_2022.pdf. (indicating that increased demand projections may lead to reliability concerns for the electric grid, especially as dual-peaking or seasonal peaking times change with increased electrification)

[118] *See*, *e.g.* , Shelley Challis, POST REGISTER, "Jervois shuts down Idaho Cobalt mine" (Apr. 7, 2023), *available at* https://www.postregister.com/messenger/news/jervois-shuts-down-idaho-cobaltmine/article efd97f32-d015-11 ed-9424-bfb2822021 0c.html.

develop at a faster than expected pace and commercial scale facilities are fully permitted, litigated, and constructed, there will not be nearly enough batteries to recycle to counter the shortfall in the quantity of critical minerals needed to meet the projected battery demand. Moreover, many 'spent' EV batteries still have 70-80 percent of their capacity left, which is more than enough to be repurposed into other uses such as energy storage and other lower-cycle applications. This will extend the time that batteries and raw materials remain in use.[119]

Automakers' recent comments to EPA's Multi-Pollutant Emissions Standards Proposed Rule express grave concern regarding the availability of critical minerals needed to produce batteries.[120] OEMs, cathode or anode producers, and battery manufacturers are internally assessing their raw material offtake agreements and expect that some projects will not materialize to fruition. EVs are projected to represent approximately 90 percent of lithium demand by 2030, so switching chemistries for other uses will not reduce the burden or price on lithium.[121]

In light of the above, the Proposed Rule creates a long-term dependence on foreign mineral production and this, coupled with present domestic limitations in battery manufacturing capabilities, will make it impossible to sustain a viable domestic supply chain in the timeline of the Proposed Rule. Even assuming critical minerals are available, a viable supply chain requires sufficient capacity of midstream mineral refining operations prior to battery cell production. Such capacity does not exist. For instance, Benchmark Minerals Intelligence (BMI) foresees a 77 percent deficit in domestic available cathode active material to meet 2035 demands in North America (and this estimate does not account for recent proposals that would drastically increase EV production demands).[122]

Additionally, current government efforts are insufficient to accelerate the supply chain. For example, U.S. supply of battery anode material is supported by the IRA and BIL, but the production of raw materials supply that feeds the production of battery anode material is not supported. As described above in more detail, Chinese battery firms are currently the most advanced and the majority of raw material mining and processing goes through Chinese entities. Thus, it will be difficult for many OEMs to meet the requirements for IRA credits in the near term and few batteries would qualify for the tax credit. Without a domestic solution to this value chain, reliance on imports may add to the cost of the battery pack.[123]

These material availability and supply chain constraints are not simply a short-term problem until domestic production capabilities ramp-up. Any reliance on or consideration of public

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[119] Engel, H., Hertzke, P., & Siccardo, G. (2019, April). Second-life EV batteries: The newest value pool in Energy Storage. McKinsey Center for Future Mobility, available at https://www.mckinsey.com/~/media/McKinsey/Industries/Automotive%20and%20Assembly/Our%20Insights/Second%20life%20EV%20batteries%20The%20newest%20value%20pool%20in%20energy%20storage/Second-life-EV-batteries-The-newest-value-pool-in-energy-storage.ashx

[120] AAI Comments at iv-v.

[121] McKinsey & Co., Lithium Mining: How new production technologies could fuel the global EV revolution, April 12, 2022. Available at https://www.mckinsey.com/industries/metals-and-mining/our-insights/lithium-mining-how-new-production-technologies-could-fuel-the-global-ev-revolution

[122] Benchmark Materials Intelligence, "Ambition versus reality: why battery production capacity does not equal supply" (Sept. 2, 2022) at Charts 5, 6, *available at* https://source.benchmarkminerals.com/article/ambition-versus-reality-why-battery-production-capacity-does-not-equal-supply.

[123] Ibid, (*see* Chart 2, 3 & 4).

statements or public commitments of OEMs regarding plans to develop infrastructure such as construction of gigafactories in North America, is tenuous at best given the highly complex nature of these projects, which require many years, significant resources, and government approvals/permits to materialize (if they even materialize at all). As described in more detail in Section III.B.1.d.i, if these factories do materialize, they are likely to operate at rates significantly lower than their full capacity, making actual capacity significantly lower than total projected capacity.

Limited supplies and constrained supply chains risk production downtime and inventory backlogs—and this is just for production of the EVs.[124] The Daimler Truck Group ("Daimler"), for example, has been and is likely to continue to be "acutely affected by an ongoing global shortage of semiconductors, which must be purchased on the global market."[125] And with the "rapidly rising demand for certain new technologies, such as electrified powertrains," Daimler anticipates higher product costs, supply bottlenecks, and long-term increases in demand for battery cells, semiconductors, and certain critical materials, such as lithium." Taken together, Daimler anticipates these supply chain concerns would limit its "ability to meet demand for its current generation of vehicles (including its vehicles with conventional combustion engines) or commercialize its new [ZEVs] profitably (or at all)."[126] Daimler, of course, is not alone in these conclusions.

As NHTSA considers the technological feasibility of its proposal, it should account for the likelihood that automakers are unable to obtain adequate resources to adapt to these stringent requirements, especially in light of increasing global supply chain issues and price increases associated with battery demand.

#### b) The Proposed Rule has not adequately examined the implications for U.S. electric system reliability.

NHTSA's proposed standards rely on the unsubstantiated assumption that the U.S electrical and transmission grid will be available to power the massive numbers of EVs that will enter the market. In reality, current U.S. electrical and transmission grid infrastructure falls drastically short of being able to meet the charging needs of NHTSA's EV penetration assumptions. Expansion and upgrades are also unrealistic within the timeline of the Proposal due to significant supply constraints.

##### i. NHTSA has not adequately demonstrated that the U.S. electrical grid and transmission grid cannot reliably support the assumed penetration rates.

Even assuming sufficient EVs can be manufactured with the corresponding consumer demand to buy them, NHTSA has not fully considered whether the electrical and transmission

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[124] *See* Daimler Truck Group, *Annual Report 2022*, 141 *available at* https://www.daimlertruck.com/fileadmin/user_upload/documents/investors/reports/annual-reports/2022/daimler-truck-ir-annual-report-2022-incl-combined-management-report-dth-ag.pdf (describing Daimler Truck Group's reliance on certain commodities, like steel, copper, and precious metals that are usually sourced from individual suppliers, meaning that a single supplier's inability to fulfill delivery obligations can have detrimental effects for an entire production line).
[125] *Id.*
[126] Id.

grid will be sufficient to support them. Grid resiliency is at risk of further deterioration due to increasing power demand from electrification, not just in transportation.

The Proposal will drastically strain our nation's electricity system. In the U.S., the estimated increase in energy consumption is 15 percent by 2050, without consideration of NTHSA's Proposal (let alone the proposals of EPA, CARB and other agencies, which will combine to require a drastic fleet transition and spike in electricity demand). Notably, this value is likely much higher considering the anticipated increase of between 900 and 2,000 percent electricity purchased for transportation by 2050 with the increased adoption of EVs.[127] The Department of Energy concluded that transmission systems must expand by 60 percent by 2030 and triple that capacity by 2050 to meet the Administration's emissions goals.[128] An author of the Princeton University's Net-Zero America Project[129] said "The current power grid took 150 years to build. Now, to get to net-zero emissions by 2050, we have to build that amount of transmission again in the next 15 years and then build that much more again in the 15 years after that. It's a huge amount of change."[130]

Yet, our electricity generation and transmission systems are increasingly challenged to keep up with current demand. As shown in Figure 10, the North American Electric Reliability Corporation's (NERC) recent summer assessment shows roughly two-thirds of the U.S. faced increased resource adequacy risk in the summer of 2023.[131]

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[127] EIA, "U.S. energy consumption increases between 0% and 15% by 2050" (Apr. 3, 2023) *available at* https://www.eia.gov/todayinenergy/detail. ph p?id=56040#:- :text=U. S. %20energy%20consu mption%20increases%20between%200%25%20and%2015%25%20by%202050.

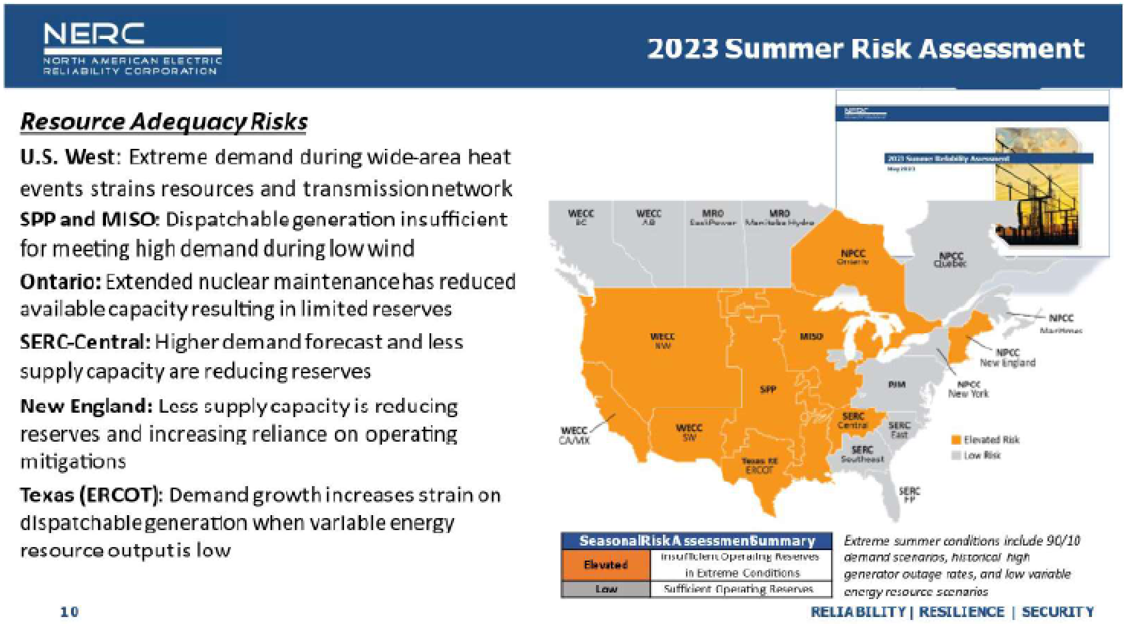
[128] Evan Halper and Timothy Puko, "Biden's Ambitious Climate Plans for EVs Face These Big Hurdles," The Washington Post, April 16, 2023.

[129] E. Larson, et al., Net-Zero America: Potential Pathways, Infrastructure, and Impacts, Final report, Princeton University, (Oct. 29, 2021 ).

[130] Molly Seltzer, PRINCETON, "Big but Affordable Effort Needed for America to Reach Net-Zero Emissions by 2050, Princeton Study Shows" (Dec. 15, 2020) *available at* www.princeton.edu/news/2020/12/15/bigaffordable-effort-needed-america-reach-net-zero-emissions-2050-princeton-study. Accessed 28 June 2023.

[131] NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION, "2023 Summer Reliability Assessment" (May 2023).

**Figure 10: NERC 2023 Summer Risk Assessment**[132]




Depending on where you are, the long-term reliability assessment is not much better. NERC's 2022 Long-Term Reliability Assessment of the U.S. analyzed the electrical grid and the entities delivering power to the continental United States during 2023-2032.[133] Regional operators of the power grid—Regional Transmission Organizations (RTOs) or Independent System Operators (ISO)—are responsible for transmission, but also balancing a regional power system to ensure that supply constantly matches demand. The grids in some RTOs are already under various degrees of stress. Several operating regions are still at-risk during periods of peak demand, including the Midcontinent ISO (which will face challenges in meeting above-normal peak demand), the SERC—Central area (where, compared to the summer of 2022, forecasted peak demand has risen by over 950 MW while growth in anticipated resources has remained flat) and the Southwest Power Pool (where reserve margins have fallen as a result of increasing peak demand and declining anticipated resources).[134] Combined with other issues, such as a disorderly transformation of the generation base as conventional units are replaced with intermittent resources, increased electrification raises questions about the grid's ability to reliably meet consumer demand on a regional basis.

Future electricity demand is expected to grow due to government policies for ZEV adoption and energy transition programs. The California Energy Commission staff estimates that by 2030,

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[132] NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION, "2023 Summer Energy Market and Electric Reliability Assessment" (May 18, 2023), *available at* https://www.ferc.gov/newsevents/news/presentation-report-2023-summer-energy-market-and-electric-reliability-assessment

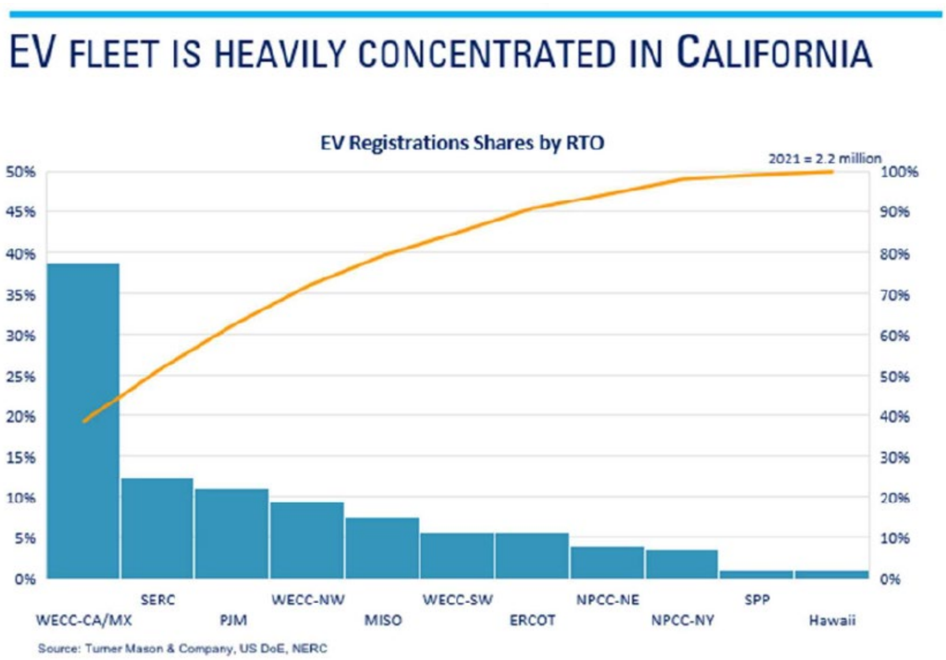
[133] NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION, "2022 Long Term Reliability Assessment" (December 2022), *available at* https://www.nerc.com/pa/RAPNra/Reliability%20Assessments%20DL/NERC L TRA 2022.pdf.

[134] NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION, "2023 Summer Reliability Assessment" (May 2023) at 23, *available at* https://www.nerc.com/pa/RAPNra/Reliability%20Assessments%20DL/NERC SRA 2023.pdf.

an additional 5,500 MW of demand at midnight and 4,600 MW of demand at 10:00 a.m. on a typical weekday will be needed for plug-in ZEV charging.[135] This is an increase of 25 and 20 percent, respectively, at those times. State and local policies for transitioning appliances and heating systems, such as banning natural gas stoves, can also affect projections of electricity demand and daily load shapes.[136] Moreover, as global temperatures rise, increased use of air conditioning will draw a greater load from the grid. As recently reported, "two-thirds of North America is at risk of energy shortfalls this summer during periods of extreme demand."[137]

The ability to charge these vehicles is driven by the ability of the RTOs and ISOs to manage regional or local power grids to supply electricity on demand. By 2022, more than 50 percent of EVs were concentrated in California (WECC-CA/MX), Florida (SERC), and Texas (ERCOT).[138] The distribution of the EV fleet across RTOs can be seen in Figure 11, in which state shares of EV registrations are allocated across RTOs.[139]

**Figure 11: ZEV registrations by RTO[140]**

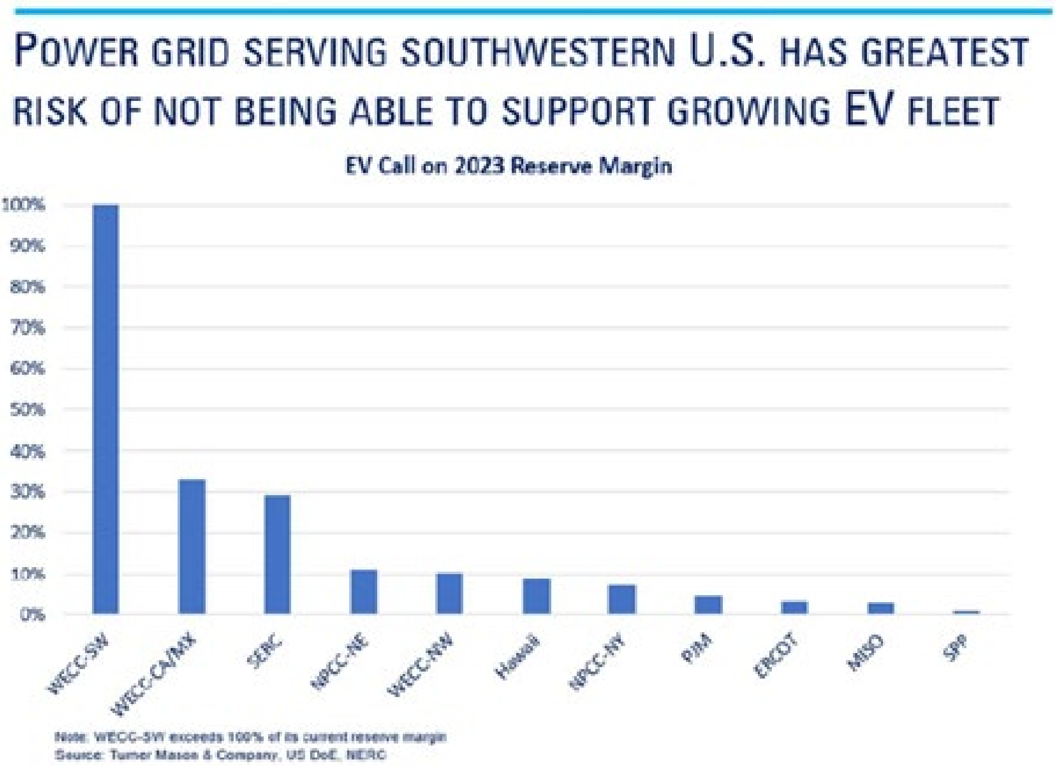



The grid's ability to charge EVs is driven by the ability to manage regional or local power grids to supply electricity on demand. By 2022, over 50% of EVs were concentrated in California, Florida, and Texas.[141] The distribution of the EV fleet across RTOs can be seen Figure 12, which

135 Id.
136 Id.
137 https://www.cnn.com/2023/06/26/business/heat-wave-power-blackout/index.html.
138 S&P GLOBAL MOBILITY, "EV Chargers: How Many Do We Need?" (Jan. 9, 2023), *available at* press.spglobal.com/2023-01-09-EV-Chargers-How-many-do-we-need.
139 There are several states which are covered by more than one RTO. For this high-level assessment, the Turner Mason Report allocates state EV sales by roughly the geographic footprint of each RTO within the state.
140 Turner Mason Report.
141 Turner Mason Report.

shows that the greatest stress is not in California (although it is significant in California), but rather in the southwestern U.S. In the southwestern U.S., electricity demand from ZEV charging is expected to completely consume the 2023 reserve margin for the WECC-SW grid, leaving no reserve margin to address emergency conditions.

**Figure 12: EV Power Requirement by RTO**




In contrast, power generation using traditional fuels has an advantage in the capacity being located near demand centers. Except for nuclear, any lower-carbon power generation capacity must be located at the energy source (e.g., where the wind blows, water flows, sun shines). Supplying lower-carbon electricity to charge EVs also needs to resolve the transmission of that power to the demand center. NHTSA makes the unsubstantiated presumption that the installation of transmission capacity will occur in a timely manner. The Bureau of Land Management (BLM) recently issued its record of decision for the SunZia Southwest Transmission Project more than 15 years after the project was proposed.[142] Once this incremental power is transmitted from supply location to a load center, there are potentially additional distribution transmission constraints before the electrons reach charging stations and homes. One supercharger equals the launch of 70 air-conditioning units at once. Such an instant change in the power demand profile is a significant problem for the local distribution grid. This is compounded by the fact that Level 2 EV chargers, typically used in a home, can increase a home's

[142] Emma Peterson, INSIDE CLIMATE NEWS, "SunZia Southwest Transmission Project Receives Final Federal Approval" (May 29, 2023) *available at* https://insideclimatenews.org/news/29052023/sunzia-transmission-project-approval/.

peak load by 40% to 100%, which can stress neighborhood transformers and compromise reliability.

The intensity is further complicated in that the capacity factor (percentage of time a plant is likely to be available for generation) of solar (28%) and wind (36%) plants is so much lower than dispatchable (typically 90+%) generation capacity. To put the intensity of effective generation capacity in perspective, solar and wind farms require almost three times as much copper to meet the load of a typical (combined cycle gas turbine) natural gas plant. Moreover, NHTSA has failed to account for the impacts of new regulations on the grid, including the effect of EPA's new proposed carbon dioxide standards for fossil-fuel fired power plants.[143] NHTSA fails to account for how the increased demand for baseload and peaking power as a result of the Proposed Rule can be met as affordable base-load generators are rapidly phased out. Even in California, where renewable energy is a priority, daily evening peak load is still routinely supplied by approximately 70 percent fossil fuels.[144]

Despite the projected increased demands on U.S. energy generation and storage capacity,[145] NTHSA offers little to no support that these demands will be sufficiently met. NHTSA cannot blindly propose a standard without accounting for the infrastructure needed to support its Proposal.

**ii. Global supplies of critical minerals and metals are inadequate to support the required electrical grid expansion.**

Without existing energy generation and storage in place to support NHTSA's Proposal, the U.S. energy and transmission grid would require significant expansion and upgrades to support the assumed EV penetration rates. This raises significant concerns regarding the availability of materials needed to expand and upgrade the grid. Beyond materials needed to produce an EV itself, the electricity networks needed to charge these vehicles also require a large amount of copper and aluminum.[146] The need for grid expansion that would result from this rapid increase in electricity demand underpins a doubling of annual demand for copper and aluminum.[147] Most supply of these materials will come from overseas, as the United States lacks current production capacity or the ability to increase such capacity in time to meet the increased demand.

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[143] EPA, New Source Performance Standards for Greenhouse Gas Emissions From New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Emission Guidelines for Greenhouse Gas Emissions From Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule, 88 Fed. Reg. 33,240 (May 23, 2023).

[144] *See, e.g.*, CALIFORNIA ISO, "Today's Outlook" (accessed June 13, 2023), *available at* https://www.caiso.com/TodaysOutlook/Pages/supply.html#section-supply-trend (showing data from Aug. 4, 2022, indicating more than 70 percent of energy from natural gas, coal, and imports).

[145] *See, e.g.*, U.S. DRIVE, "Summary Report on EVs at Scale and the U.S. Electric Power System" (Nov. 2019), *available at* https://www.energy.gov/eere/vehicles/articles/summary-report-evs-scale-and-us-electric-power-system-2019 (summarizing impacts of light-duty vehicles on energy generation and generation capacity alone and acknowledging several potential challenges without including analysis of medium- and heavy-duty ZEVs).

[146] IEA Report 2022.

[147] *Id*.

Aluminum is critical to expanding the electric grid and lightweighting vehicles. The United States does not supply much of the world's aluminum. Instead, China, Russia, and India lead global production with an estimated 45 million metric tons per year. China possesses more than half of the entire world's aluminum smelting capacity and produces by far the most aluminum of any country at over 36 million tons per year.[148] The United States, by contrast, produces approximately 1 million tons per year. Similarly, countries supplying the most copper are Chile, Peru, China, and the Democratic Republic of the Congo. These countries supply ten times the amount produced domestically.

Experts predict our demand for these materials will rise dramatically, but we lack the ability to source them domestically. The latest data concludes sourcing copper for electric infrastructure (e.g., charging stations and storage) needed to accommodate increased electrical demand will be challenging.[149] Copper demand is expected to rise by 53 percent, while supply is expected to rise by only 16 percent.[150] U.S. import dependency for copper has grown from 10 percent in 1995 to 40 percent in 2020, with projections of copper import dependency reaching between 55 percent and 67 percent between 2020 and 2040.[151] Other estimates predict that by 2030 supply from existing mines and projects under construction is estimated to meet only 80 percent of copper needs by 2030[152]—not considering the increase in EV production anticipated by the Proposed Rule.

As mentioned below, establishing new mines, particularly in the United States, is not a near-term solution. Permitting and authorizing new domestic mining and smelting capacity requires a substantial amount of time and government support. Globally, regulatory approval for new copper mines is at its lowest level in a decade.[153] As a case in point, the Resolution copper deposit in Arizona was discovered in 1995. This world-class resource has been stranded without the necessary regulatory approvals for over 27 years. As recently as May 19, 2023, the U.S. Forest Service told a federal court it was suspending approval of a land swap between the project (owned by Rio Tinto and BHP) and several Native American groups.[154] The land swap was approved by the U.S. Congress in 2014, but the completed environmental report was blocked in March 2021. Other copper mining projects in Alaska and Minnesota have been halted by this

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148 Andy Home, "Global aluminum production pendulum swings back to China" (June 21, 2022) *available at* https://www.mininq.com/web/column-qlobal-aluminum-production-pendulum-swinqs-back-to-china/.
149 IEA Report 2022.
150 BLOOMBERGNEF, "Copper Miners Eye M&A as Clean Energy Drives Supply" (Aug. 30, 2022), *available at* https://about.bnef.com/blog/coppers-miners-eye-ma-as-clean-energy-drives-supplygap/#:-:text=Copper%20demand%20is%20set%20to,and%20difficulty%20developing%20greenfield%20mines.
151 S&P GLOBAL, "The Future of Copper Will the Looming Supply Gap Short-Circuit the Energy Transition?" (July 2022) *available at* https://cdn.ihsmarkit.com/www/pdf/0722fThe-Future-of-Copper Full-Report 14July2022.pdf.
152 IEA Report 2022.
153 Ernest Scheyder, REUTERS, "Copper Industry Warns of Looming Supply Gap without More Mines" (Apr. 21, 2023) *available at* www.reuters.com/markets/commodities/copper-industry-warns-loominq-supplygap- without-more-mines-2023-04-20/.
154 Ernest Scheyder, REUTERS "U.S. Forest Service Pauses Timeline for Rio Tinto Arizona Copper Mine" (May 19, 2023) *available at* https://www.reuters.com/leqal/us-forest-service-pauses-timeline-rio-tintoarizona-copper-mine-2023-05-19/.

administration, resulting in increased import dependence.[155] NHTSA simply has not accounted for the lack of critical materials needed to facilitate such drastic EV penetration rates.

#### c) Charging infrastructure is not sufficient to meet NHTSA's EV penetration assumptions

In addition to the underlying power generation and supply needed to support the assumed EV penetration rates, a drastic overhaul of U.S. EV charging infrastructure would also be required. NHTSA fails to consider the critical need for "equitable, affordable charging."[156] Currently, EV charging is most available in metropolitan areas, with less investment occurring outside urban areas.[157] While a significant percentage of the charging installations deployed today are Level 2 EVSEs, dual charging installations to enable the flexibility of passenger car, light truck, and HDPUV charging will become increasingly important. Direct current fast charging equipment (DCFCs) will enable broader market coverage, even for passenger cars used in applications where they cannot sit for 6 hours and charge during off-peak, lower-cost electricity periods. As utility companies gear up to provide infrastructure installations, NHTSA should not minimize the impact of supply chain shortages necessary for installing supporting charging infrastructure.

Even where charging infrastructure may be available in theory, it often is unavailable to consumers in practice. For example, many available chargers are unreliable. A recent study on the reliability of fast chargers found that in 22.7 percent of the cases studied, chargers were nonfunctional because of "unresponsive or unavailable touchscreens, payment system failures, charge initiation failures, network failures, or broken connectors," and 4.9 percent of charging cable were too short to reach an EV's charge port.[158] Similarly, in a J.D. Power study, owners in high EV volume markets like California, Texas and Washington are finding the charging infrastructure inadequate and plagued with non-functioning stations.[159] This is a significant technological issue that calls into question the viability of the existing charging network as well as future deployments. Given that the Proposal will create additional charging demand, NHTSA must analyze and identify a solution. Absent comprehensive understanding of the dynamics between increased ZEV use and charging infrastructure needs, automakers and consumers are vulnerable.

#### d) The proposed timeline is unrealistic

NHTSA's proposed timeline is simply infeasible. NHTSA has not adequately accounted for the sourcing of materials required for EV production, charging infrastructure, and an enormous

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155 Jim Vinoski, "There's Not Enough Copper for Our Electrification Plans-and Biden Is Making It Worse," Forbes, April 28, 2023, *available at* www.forbes.com/sites/jimvinoski/2023/04/28/theres-not-enoughcopper-for-our-electrification-plansand-biden-is-making-it-worse/?sh=19ca0a5d1fbf.
156 Joann Muller, "The electric car revolution hinges on equitable, affordable charging," Axios, Feb. 8, 2023, *available at* https://www.axios.com/2023/02/08/electric-vehicle-charging-stations-equity.
157 S&P Global Mobility, "EV Chargers: How Many Do We Need?," Jan. 9, 2023, *available at* https://press.spglobal.com/2023-01-09-EV-Chargers-How-many-do-we-need.
158 Rempel, David and Cullen, Carleen and Bryan, Mary Matteson and Cezar, Gustavo Vianna, "Reliability of Open Public Electric Vehicle Direct Current Fast Chargers," April 7, 2022, *available at* SSRN: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4077554.
159 J.D. Power. Press Release, "2022 U.S. Electric Vehicle Experience (EVX) Public Charging Study," August 2022, *available at* www.jdpower.com/business/press-releases/2022-us-electric-vehicleexperience-evx-public-charging-study.

buildout of both electricity generation and transmission capacity.[160] Even setting aside the significant supply limitations and national security concerns described above, there simply is not enough time to implement the upgrades and expansion required to support NHTSA's Proposal.

**i. Current battery and EV production is insufficient to support the assumed EV penetration rates during the standard setting years.**

NHTSA's assumptions in the baseline and standard modeling regarding EV penetration rates are unrealistic given the current and projected battery and EV production rates during the proposed CAFE standard period. Automakers have repeatedly said as much, reiterating these concerns to EPA, NHTSA, and CARB.[161] EV battery and vehicle production rates will need to increase significantly over a short time period to meet NHTSA's assumed penetration rates. NHTSA has not demonstrated that such a drastic production and capacity ramp up is achievable in the time allotted. Indeed, it is not. In fact, the only way the proposal is achievable is through the use of fictitious multipliers that distort the calculated fuel efficiency of EVs.[162]

Estimates of cell or battery manufacturing capacity over the next decade vary widely. Battery manufacturing facilities or gigafactories are extraordinarily complex projects that will take many years to materialize if they progress to the point of battery production. Wood Mackenzie projects U.S. battery manufacturing capacity at 422 GWh/ year in 2030,[163] because many projects have failed to materialize or are delayed as market and other conditions change. Further, it is unlikely that these factories will operate beyond 50 percent capacity for years. Mature battery factories today rarely operate above 80 percent utilization rates. For example, in 2022, there was 1,036 GWh of global battery production capacity, but only 450 GWh of actual production. While there was approximately 7TWh of forecast battery capacity planned as of September 2022, Benchmark Minerals Intelligence (BMI) forecast total global supply of Li-ion batteries to reach only 4.5 TWh by 2031 or a 64 percent utilization rate.[164] This step in the value chain could potentially create a critical bottleneck.

Beyond the lack of infrastructure needed to manufacture EVs, the raw material supplies for such manufacturing are also insufficient. NHTSA severely overestimates the availability of minerals and the mining/processing infrastructure and capabilities in the U.S. The development of natural resources projects, like critical mineral mining and processing, can easily require over

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[160] See AAI Comments at i-ii (EPA's proposed GHG and multi-pollutant rule for MY 2027 and after are infeasible within the prescribed timeframe).

[161] *See, e.g.*, Alliance for Automotive Innovation, Comments to U.S. Environmental Protection Agency Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles Proposed Rule, No. EPA-HQ-OAR-2022-0829-0701 (July 5, 2023); Alliance for Automotive Innovation, Advanced Clean Cars 2, Auto Innovators Comments (May 31, 2022).

[162] If the Department of Energy finalizes its proposed adjustments to the EV Petroleum Equivalence Factor, see 88 Fed. Reg. 21,525 (April 11,2023), these CAFE standards will be clearly unachievable if NHTSA fails to significantly adjust its standards.

[163] Wood Mackenzie, "The EPA plans to rev up US EV sales," Apr. 14, 2023, *available at* https://www.woodmac.com/news/opinion/the-epa-plans-to-rev-up-us-ev-sales/.

[164] Benchmark Minerals Intelligence Source, "Ambition versus reality: why battery production capacity does not equal supply," Sept. 2, 2022, at Charts 5, 6, *available at* https://source.benchmarkminerals.com/article/ambition-versus-reality-why-battery-production-capacity-does-not-equal-supply.

a decade. Increasing supply is not merely a matter of increasing current production. Increasing mining production is limited by significant regulatory hurdles and capital investment requirements. Globally, it takes on average over 16 years to move mining projects from first discovery to production.[165]

Establishing new mines, particularly in the U.S., also requires a substantial amount of time just to obtain necessary permits and authorizations. As mentioned earlier as a case in point, the Resolution copper deposit in Arizona was discovered in 1995. This world-class resource has been trying to acquire the necessary regulatory approvals for over 27 years. As recently as May 19, 2023, the U.S. Forest Service told a federal court it was suspending approval of a land swap between the project (owned by Rio Tinto and BHP) and several Native American groups.[166] The land swap was approved by the U.S. Congress in 2014, but the completed environmental report was blocked in March 2021. Even with the requisite authorizations in hand, mine development and production can take years. For an open pit mine, it takes about 7 to 8 years from discovery to first ore; for a subsurface mine, the time frame is more like 10 to 12 years.

The ability to quickly scale minerals production is further affected by ore quality, which in recent years has been declining, and thus requires more material to be mined, more resources such as water in stressed areas for processing, and ultimately greater environmental impacts. For example, the average ore grade for copper discoveries decreased in excess of 25 percent during the last 15 years. In that same period, total energy consumption increased at a higher rate (46 percent) than production (30 percent).[167] Extraction (i.e., mining and processing) of metal content from lower-grade ores requires removing more overburden to access the ore body, which requires more energy, exerting upward pressure on production costs, greenhouse gas and criteria pollutant emissions, and waste volumes. And once the raw material is mined, it must be qualified. This is not a mine-to-producer scenario. It is a specialty chemical that must be tested at different stages for safety, consistency of product output, and performance before it can be qualified for use in battery/ZEV manufacturing. Substantial lead time is needed to qualify battery-grade materials as they go through a very rigorous, staged approach. Careful attention to putting up projects on the scale of raw material resource extraction and gigafactories requires time, careful consideration, and intensive safety precautions. Accelerating the buildup of a domestic battery value chain should not overstep aspects of safe project development.

The required critical minerals are not available at scale today and raw material extraction capacity simply cannot be increased as quickly as required to meet the assumed production rates. Production cannot continue at the assumed rates without the necessary raw materials and infrastructure, which take time to develop.

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[165] International Energy Agency, "The Role of Critical Minerals in Clean Energy Transitions," March 2022, *available at* https://iea.blob.core.windows.net/assets/ffd2a83b-8c30-4e9d-980a-52b6d9a86fdc/TheRoleofCriticalMineralsinCleanEnergyTransitions.pdf.

[166] Ernest Scheyder, Reuters, "U.S. Forest Service pauses timeline for Rio Tinto Arizona copper mine," May 19, 2023, *available at* https://www.reuters.com/legal/us-forest-service-pauses-timeline-rio-tinto-arizona-copper-mine-2023-05-19/.

[167] Calvo, G.; Mudd, G.; Valero, A.; Valero, A. Decreasing Ore Grades in Global Metallic Mining: A Theoretical Issue or a Global Reality? *Resources* 2016, *5*, 36 *available at* https://doi.org/10.3390/resources5040036.

### ii. The grid cannot be expanded within the timeline contemplated by the rule

It is also unlikely that the U.S. energy and transmission grid can be upgraded quickly enough as assumed by NHTSA's Proposed Rule. Beyond the normal approximately four-year lead time for vehicle manufacturers to make incremental changes to their production, the typical electricity transmission system capital project timeline is approximately ten-years and would need to be accelerated to have a chance to support the proposed EV demand, while current large-scale electric generation and storage projects are increasingly backlogged year-on-year due to long lead times for permitting and approvals, supply chain shortages, and shortage of skilled workers. While government programs have recently been put in place to help overcome some of these hurdles, they will take time for the benefits to be realized.[168]

A recent DOE-funded study finds that: "[o]nly ~21% of projects (14% of capacity) requesting interconnection from 2000-2017 reached commercial operations by the end of 2022"; "[c]ompletion rates are even lower for wind (20%) and solar (14%); and "[t]he average time projects spent in queues before being built has increased markedly. The typical project built in 2022 took 5 years from the interconnection request to commercial operations."[169]

According to the National Mining Association, it can take up to 10 years to obtain a permit to commence mining operations in the U.S., while permitting takes two years in Canada and Australia.[170] "[U]nless the permitting process can be improved, U.S. mining developments will continue to take longer to come online and carry more financial risks compared with the rest of the world, China's domination of battery manufacturing and critical minerals production will continue for a longer period, and the U.S. will find it increasingly difficult to acquire the metals and minerals it needs for its long-term clean-energy goals."[171] The Bureau of Land Management placed a 20-year moratorium on mining rare earth minerals, such as copper, nickel, and cobalt, from almost a quarter of a million acres of Minnesota, effectively killing the proposed Twin Metals copper-nickel mine project.[172]

NHTSA ignores the significant supply constraints, permitting hurdles, and financial challenges associated with expanding the U.S. energy and transmission grid. Consequently,

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[168] Gracie Brown, et al., "Upgrade the grid: Speed is of the essence in the energy transition," McKinsey and Company, Feb. 1, 2022, *available at* https://www.mckinsey.com/capabilities/operations/our-insights/global-infrastructure-initiative/voices/upgrade-the-grid-speed-is-of-the-essence-in-the-energy-transitionl; Deloitte, "2023 power and utilities industry outlook" *available* https://www2.deloitte.com/content/dam/Deloitte/us/Documents/energy-resources/us-eri-power-utilities-outlook-2023.pdf.

[169] *See* Lawrence Berkeley National Laboratory, "Queued Up: Characteristics of Power Plants Seeking Transmission Interconnection As of the End of 2022," *available at* https://emp.lbl.gov/sites/default/files/queued_up_2022_04-06-2023.pdf.

[170] National Mining Association, "Delays in the U.S. Mine Permitting Process Impair and Discourage Mining at Home," May 31, 2021, *available at* https://nma.org/wpcontenUuploads/2021/05/Infographic_SNL_minerals_permitting_S. 7 updated.pdf.

[171] Jason Lindquist, "Don't Pass Me By - With Many Steps Required, Mining Projects Face Trickiest Path To Approval," RBN Energy Blog, June 30, 2023, *available at* https://rbnenergy.com/dont-pass-me-by-with-many-steps-required-mining-projects-face-trickiest-path-to-approval.

[172] 88 Fed. Reg. 6308 (Jan. 31, 2023).

NHTSA is pushing EV technology at a pace that cannot be adopted within the timeframe of its own Proposal.

#### iii. The required charging infrastructure cannot be deployed during the standard setting years.

NHTSA's Proposal would also require a major overhaul of EV charging infrastructure in the U.S. This overhaul requires investment and action not only from the energy and automotive sectors, but by state and local governments, businesses, and individuals. NHTSA glosses over this extremely complex issue despite ample evidence suggesting that range anxiety and lack of sufficient charging infrastructure remain a critical hurdle to the willingness of Americans to purchase EVs.

Many of the same mineral supply issues that apply to EV production and energy grid expansion also apply to the installation of charging infrastructure. However, this issue is further compounded by significant logistical issues, including complicated considerations about how to provide Americans in different living situations with access to affordable charging options. NTHSA cannot effectively require Americans to shift to EVs without providing for the necessary time and resources to facilitate the real-world requirements of these vehicles.

### e) NHTSA assumes unrealistic consumer EV adoption rates

Even if manufacturing facilities, necessary raw material supplies, and grid and charging infrastructure were sufficient to support the proposed standards, the consumer demand for EVs is simply lacking. Automakers may be publicly acquiescing to government demands, but this does not demonstrate that the technology and infrastructure will be available in the stated period and, most critically, that consumers are ready and willing to adopt electric vehicles. Indeed, many of the automakers have set "goals" for their electrification, premised explicitly on a litany of federal and state subsidies for purchase and infrastructure assistance. And these government demands, and indeed government subsidies, can vanish in an instant, through changes in administrations or judicial challenges.

As NHTSA itself acknowledges, at most only about 5 percent of the light duty vehicle fleet in 2022 were BEVs.[173] And even if production rates are slightly higher, this is unlikely to be representative of actual consumer adoption rates. In reality, projected production rates may or may not translate into sales and vehicle registration. State-by-state EV registration data shows that the percentage of ZEV registrations relative to all registered vehicles ranged from 0.15 percent in Mississippi to 4.01 percent in California.[174] Thus, the ambitions of even the most aggressive OEM from a consumer EV adoption rate perspective would require unprecedented sales over the next seven years.[175]

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[173] Draft TSD at 3-78–3-79 and Table 3-73.
[174] 2023 EV Charing Station Report: State-by-State Breakdown, June 16, 2023, *available at* https://zutobi.com/us/driver-guides/the-us-electric-vehicle-charging-point-report.
[175] VOLVO GROUP, "Report on the first quarter 2023," *available at* https://www.volvogroup.com/content/dam/volvo-group/markets/master/investors/reports-and-presentations/interim-reports/2023/volvo-group-q1-2023-eng.pdf; Tubes And Lubes Daily, "Volvo launches electric truck with longer range in N. America," January 2021, *available at*

Finally, NHTSA's overly optimistic assumptions regarding EV performance and cost are used to support its implicit assumptions regarding EV adoption and its explicit evaluation of environmental benefits (see Section III.B.4 below). Trinity Consultants reviewed NHTSA's assumptions in the TSD to assess the physical and environmental effects of the proposed standards.[176] It is well known EVs have a more limited range, need charging infrastructure, and cost more than ICEVs and hybrid vehicles, Yet Section 4.3 of the TSD makes no mention of EVs' limited range and the need for recharging when discussing how the vehicles miles traveled (VMT) input was derived. Instead, after ignoring the impacts of limited range and charging infrastructure and assuming adoption of "BEV2" vehicles with a range of 250 miles, NHTSA assumes lower operating costs that will result in EVs being driven more than other types of vehicles. It is precisely limited EV range and the lack of reliable and affordable charging infrastructure that explains recent polling showing that most Americans continue to say that they are unlikely, or will categorically refuse, to buy an EV. As just one example, a Gallup poll conducted in April revealed that only 4 percent of adults owned a ZEV and just 12 percent are seriously considering buying one. However, 41 percent of adults said they would never buy an EV, raising fundamental questions about NHTSA's assumed EV penetration rates.[177] In contrast, according to Wards Intelligence, through May 2023, Americans purchased 5.9 million ICEVs, representing 93 percent of all LDVs sold during the first five months.[178] At this pace, more than 14 million new ICEVs will be purchased during 2023.[179] With the continued sales of ICEVs, NHTSA should follow its statutory mandate to focus on alternative scenarios using ICEV technologies and renewable fuels.

The last twenty years have clearly signaled that consumer reluctance remains a huge barrier. Even after 20 years on the market, hybrid vehicles and other electric vehicle technologies have achieved low sales in comparison to their ICEV counterparts. Sales of these vehicles have fallen short of the levels necessary to meet the current model year standards, let alone those proposed. Historic marketing campaigns, tax subsidies, and benefits for various special privileges, including the use of HOV lanes and preferred parking spots, failed to generate adequate consumer interest. This can only lead to the conclusion that, despite a variety of incentives, consumers simply do not accept these vehicles in the proportion required to meet either the existing standards or the proposed standards.

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https://www.fuelsandlubes.comlvolvo-launches-electric-truck-withlonger-range-in-n-americal?mccid=b124969b23&mceid=4a00dc8f80 (Volvo Trucks set target that half of all trucks sold are electric by 2030); VOLVO GROUP, "Geared for Growth - Annual Report 2022," *available at* https://www.volvogroup.com/content/dam/volvo-group/markets/master/investors/reports-andpresentations/annual-reports/AB-Volvo-Annual-Report-2022.pdf.

[176] See Appendix B Trinity Technical Review at 12.

[177] Megan Brenan, "Most Americans Are Not Completely Sold on Electric Vehicles", Gallup, April 12, 2023, *available at* https://news.gallup.com/poll/474095/americans-not-completely-sold-electric-vehicles.aspxt.

[178] John Eichberger, "Decarbonizing Combustion Vehicles -A Critical Part in Reducing Transportation Emissions", Transportation Energy Institute, June 2023, *available at* https://www.transportationenergy.org/resources/blog-post/decarbonizing-combustion-vehicles-a-critical-part-in-reducing-transportation-emissions/.

[179] *Id*.

EV charging infrastructure, range, and charging time remain top concerns for nearly half of U.S. customers.[180] OEMs expect that ZEV penetration will not be uniform across markets, with larger impact in markets with more low carbon intensity electricity and greater electrical grid reliability.[181] Toyota announced that regional energy variation is the reason they will provide a diversified range of carbon neutral options to meet the needs and circumstances in every country and region.[182] Toyota believes optionality facilitates the ability to adapt to change, while selecting a single option is an attempt to predict the future in uncertain times.[183]

Importantly, successful implementation of NHTSA's Proposed Rule depends on consumer choice as much as it depends on technological improvements. But there is evidence that premature embrace of EV may backfire if consumers grow frustrated with inadequate infrastructure. Consumer market demand will not, and cannot, increase to meet the Proposal's required supply.

Insufficient charging capabilities, which creates range anxiety, is a key apprehension for nearly half the U.S. consumer market. For example, in California, roughly one-fifth of consumers who initially purchased PHEVs or EVs subsequently went back to ICEVs based on frustration with convenience factors such as unavailability of charging.[184] Those with multiple vehicles and a single-family home find it easier to continue ownership than those with fewer vehicles or living in multi-unit dwellings, which could lower EV adoption rates as the EV market becomes more mainstream.[185] Finally, a survey of PHEV owners in California found that current PHEV owners would not purchase their PHEV without incentives, therefore EV and PHEV adoption may face more challenges over time.[186]

EVs have less range, both technically and practically. As noted by J.D. Power, "[T]he majority of EVs provide between 200 and 300 miles of range on a full charge."[187] This same article, however, also noted that EVs with less than 200-mile ranges (such as the 2022 Nissan Leaf at 149 miles or the 2022 Mazda MX-30 at 100 miles) are "either affordable or focused on

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180 Phillipp Kampshoff, et al., McKinsey & Co., "Building the electric-vehicle charging infrastructure America needs" (Apr. 18, 2022) *available at* https://www.mckinsey.com/industries/public-sector/our-insights/building-the-electric-vehicle-charging-infrastructure-america-needs; EVBox, "6 reasons why your electric car isn't charging as fast as you'd expect," Jan. 6, 2023, *available at* https://blog.evbox.com/6-reasons-charging-times.

181 The North American Electric Reliability Corporation (NERC's) *2022 Long-Term Reliability Assessment* (Dec. 2022) projects reliability concerns for certain regional entities. *Available at* https://www.nerc.com/pa/RAPNra/Reliability%20Assessments%20DL/NERC L TRA 2022.pdf.

182 Toyota Motor Corporation, "'Video: Media Briefing on Battery EV Strategies," Press Release, December 14, 2021. *available at* https://global.toyota/en/newsroom/corporate/36428993.html.

183 *Id*. At 26.

184 Hardman, S., and Tai, G., *Discontinuance Among California's Electric Vehicle Buyers: Why are Some Consumers Abandoning Electric Vehicles*, April 21, 2021, Report for National Center for Sustainable Transportation. *Available at* https://ncst.ucdavis.edu/research-product/discontinuance-among-californias-electric-vehicle-buyers-why-are-some-consumers.

185 *Id*.

186 *Id*. *See also* JATO Blog, "A breakdown of the US EV market by State shows more incentives equals more sales", April 9, 2019 (latest research shows current tax credits and other incentives in the US are unequal among states, and that EV sales are growing at the fastest rate in states offering financial incentives).

187 *See* Sebastian Blanco, *List of EVs Sorted by Range* (Sept. 1, 2022), www.jdpower.com/cars/shoppingguides/list-of-evs-sorted-by-range.

performance."[188] With respect to longer range vehicles, claimed vehicle ranges of up to 516 miles are available, but this range comes at considerable cost. The number 1 range-rated vehicle by Car and Driver, the 2023 Lucid Air, carries a base price of $113,650. And while three out of the ten top-rated EVs by Car and Driver were more "reasonably priced" from $44,630 to $56,630, all other models within the top 10 cost anywhere from $74,800 to $110,295.[189]

Moreover, the time it takes to charge an EV compared to fueling an ICEV deters EV adoption.[190] Depending on the type of vehicle (BEV v. PHEV) and charger (Level 1, Level 2, or DCFCs), charging times from empty to 80 percent charged can range from 40-50 hours (Level 1 charging) to 20 minutes to one hour (DCFC), although most PHEVs on the market do not work with DCFCs.[191] In early 2023, a Boston Globe survey around the Boston metropolitan area found DCFC chargers were unreliable, going offline for weeks or months at a time.[192] Since close to two-thirds of U.S. households do not purchase new vehicles, lower-income people are more likely to purchase less expensive, early generation PEVs with less range and using a Level 1 or Level 2 charger requires longer charge times.[193] These extended recharging times remain a barrier to EV adoption.[194]

Additional barriers to EV adoption by particularly low-income stakeholders, include but are not limited to restricted driving/battery range; inability to charge in different housing and work situations; high price points to purchase, maintain, and insure EVs; availability of replacement parts and qualified mechanics, as well as ease and cost of repairs; and unpredictability regarding future electricity costs. NHTSA cannot ignore these real-world limitations. NHTSA should revise its analysis to account for the reality of today's automotive market and consumer demand.

#### 2. The Proposed NHTSA standards are not economically practicable.

When determining maximum feasible fuel economy standards, NHTSA is required to consider economic practicability. In doing so, NHTSA must transparently calculate and explain the proposal's costs and benefits using realistic assumptions. Yet NHTSA fails to consider the true cost implications of its Proposal; when taken into consideration these significant costs made NHTSA's proposed standards economically impracticable.

Using the CAFE model, Trinity Consultants examined the costs of compliance with the proposed standards on a dollar per vehicle basis using what NTHSA refers to as the "regulatory

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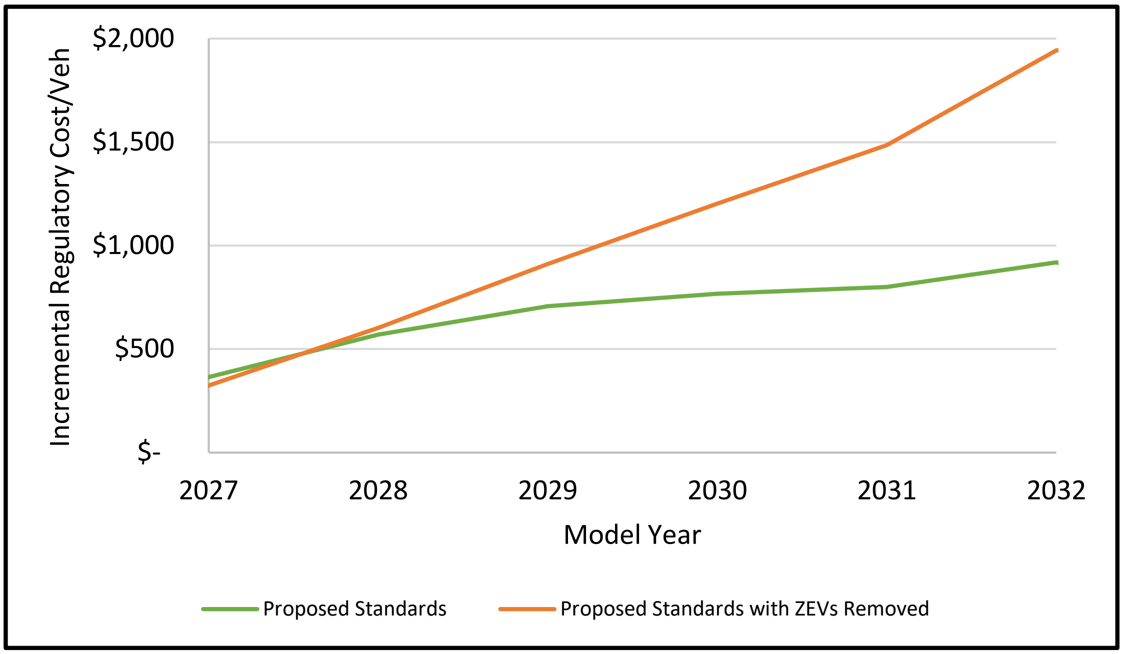
188 *Id.*
189 *See* Nicholas Wallace, Austin Irwin, & Nick Kurczewski, *Longest Range Electric Cars for 2023, Ranked* (Mar. 23, 2023), https://www.caranddriver.com/features/g32634624/ev-longest-driving-range/.
190 EVBox, EV Box Mobility Monitor (June 2022). *Available at* evbox-mobility-monitor-2022-intl.pdf (a study of EV adoption in France, Germany, the Netherlands, and the UK revealed that excessive charging time remains a deterrent to EV adoption).
191 U.S. Department of Transportation, *Charger type and speed*. *Available at* https://www.transportation .gov/rural/ev/toolkit/ev-basics/charging-speeds.
192 Aaron Pressman, "Inside the crazy, mixed-up world of electric-vehicle charger pricing," The Boston Globe, March 27, 2023. *Available at* Inside the crazy, mixed-up world of electric-vehicle charger pricing (boston.com).
193 Hardman, Scott, et al. "A Perspective on Equity in the Transition to Electric Vehicles." *MIT Science Policy Review*, 20 Aug. 2021, sciencepolicyreview.org/2021/08/equity-transition-electric-vehicles/. Accessed 29 June 2023.
194 Exro, Barriers to electric vehicle adoption in 2022. *Available at* Barriers to Electric Vehicle Adoption: The 4 Key Challenges (exro.com).

cost" which is the combination of technology costs and fines for the 19 light-duty vehicle manufacturers considered in the NHTSA analysis to be in compliance with the standard by the end of the 2032 period.[195] The regulatory costs for compliance with the proposed standards from the NHTSA baseline as well as the "no-ZEV" baseline are shown in Figure 13. As illustrated, regulatory costs are higher from the no-ZEV baseline during the entire period from 2027 through 2032 with the difference amounting to approximately $1,000 per vehicle in 2032.[196] These higher costs result from the modeled need for greater production of more strong hybrid electric vehicles (SHEV) in the no-ZEV case. Further, the number of manufacturers estimated to be able to comply with the proposed CAFE standards in 2032 drops from 7 with the NTHSA baseline to 1 with the No-ZEV baseline. However, this may be an artifact of the CAFE modeling constraints under the No-ZEV case.[197]

**Figure 13: Regulatory Compliance Costs from the NTHSA and No-ZEV Baselines During the Standard Setting Years[198]**




Looking at compliance costs from 2022 through 2050 with NHTSA and no-EV baselines, compliance costs are zero through 2026, and then the same for the standard setting years, as shown in Figure 13 (Regulatory Compliance Costs from NHTSA and no-ZEV Baselines during the Standard Setting Years). However, beyond 2032, the compliance costs using the NHTSA baseline drop due to NHTSA's unrealistic assumptions regarding EV costs. Similarly, the compliance costs for the no-EV baseline also drop at a slower rate. See Figure 14 (Regulatory Compliance Costs from NHTSA and no-EV Baselines 2022-2050). What is notable is the difference in compliance costs between the two baselines, reaching a maximum difference of approximately $1,750 per vehicle during 2035-2040.

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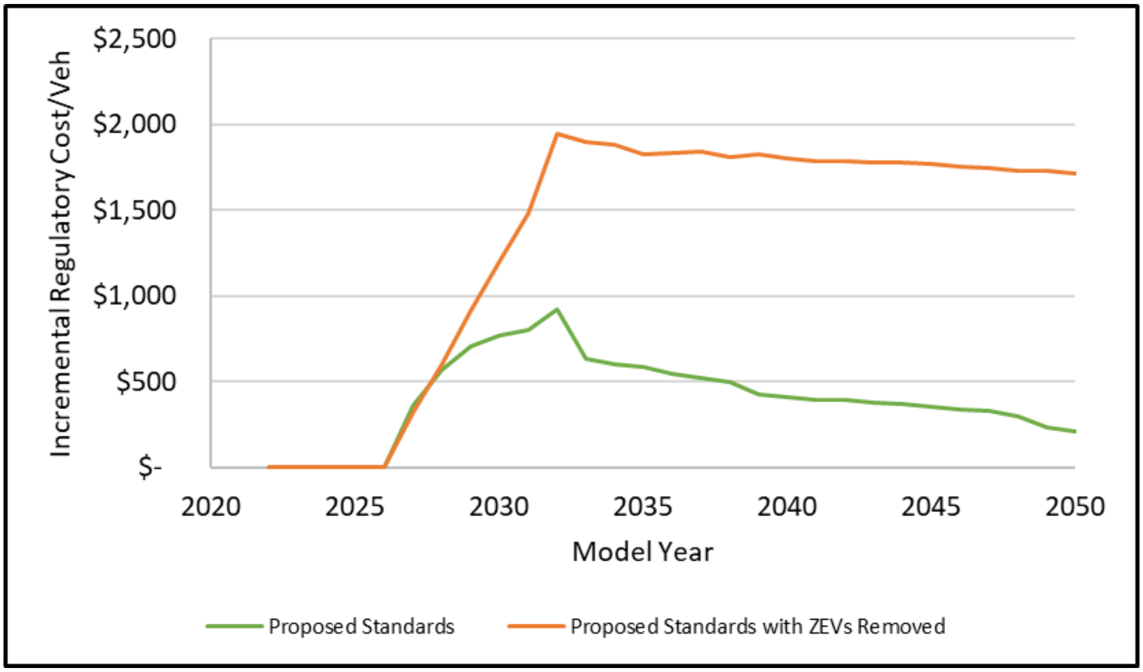
195 See Appendix B Trinity Technical Review at 4.
196 *Ibid.*
197 *Ibid.*
198 *Ibid.*

**Figure 14: Regulatory Compliance Costs from the NTHSA and No-ZEV Baselines 2022 to 2050**

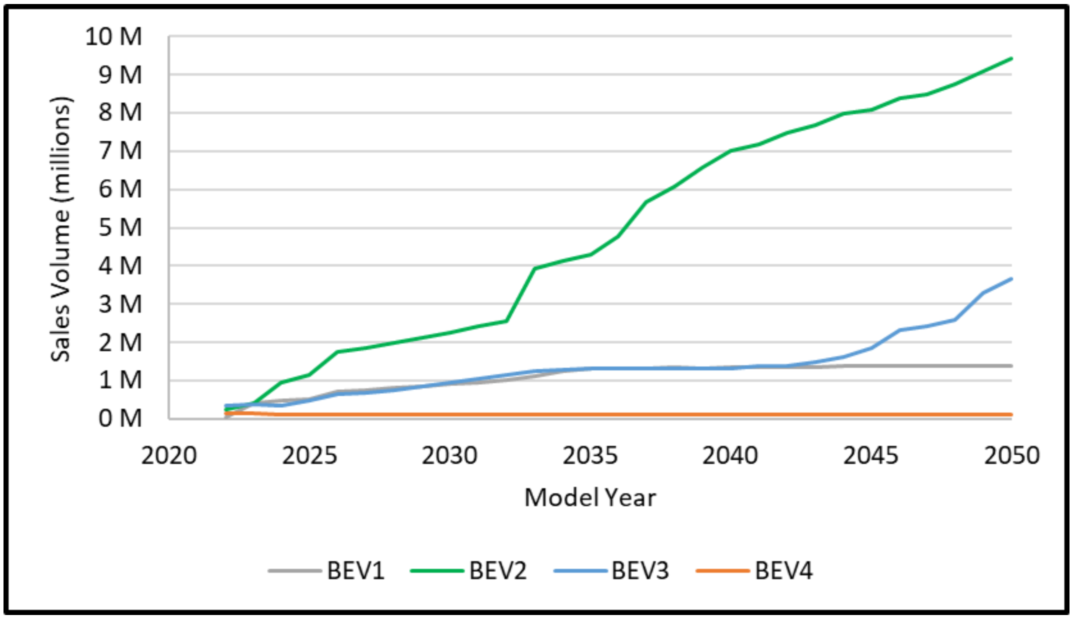



### a) NTHSA failed to consider the significant cost to produce batteries needed for EVs contemplated under its proposed standards.

NHTSA has not properly accounted for the cost and long-term affordability of battery production. As described above, sufficient supplies of raw materials, including critical minerals, needed to produce batteries for EVs are not domestically available forcing automakers to increasingly rely on foreign suppliers (see Section II.A above). Without a domestic solution to these supply limitations, reliance on imports will only add cost to the battery pack.[199] Battery costs are a critical component of NHTSA modeling and significantly affect the projected ZEV adoption rates. Using the NHTSA's CAFE model, Trinity Consultants evaluated NHTSA's assumptions regarding the distribution of EV sales as a function of battery range in the baseline fleet. As shown in Figure 15, NHTSA assumed the vast majority of EVs that will be sold in the United States will be "EV2s" with an estimated range of 250 miles, rather than higher-range vehicles requiring larger, more expensive batteries.

[199] Benchmark Minerals Intelligence, BMI (*see* Chart 2, 3 & 4).

**Figure 15: NHTSA Baseline EV Assumptions by EV Range**




This assumption is significant given the well documented concern that range anxiety is a limiting factor of EV adoption and the fact that NHTSA's assumption is necessary to lower the apparent cost of EVs in other areas of the agency's analysis, such as ensuring that more vehicles are able to qualify for the Clean Vehicle Tax Credit.

As discussed above, NHTSA violated EPCA by including EVs in the baseline used to develop its proposed CAFE standards. To demonstrate the impact of NHTSA's assumptions regarding EV performance and cost, Trinity conducted a sensitivity analysis that eliminates (1) restrictions on EVs during the standard setting years, (2) the availability of federal EV and battery tax incentives, and (3) the decreases in battery costs due to the "learning curve."[200] As shown in Figure 16 below,[201] NHTSA's assumptions regarding EV performance and cost and the impact of ACC II compliance predict 50 percent of light-duty vehicle sales will be in EVs in 2032, and reaching almost 100 percent by 2050.

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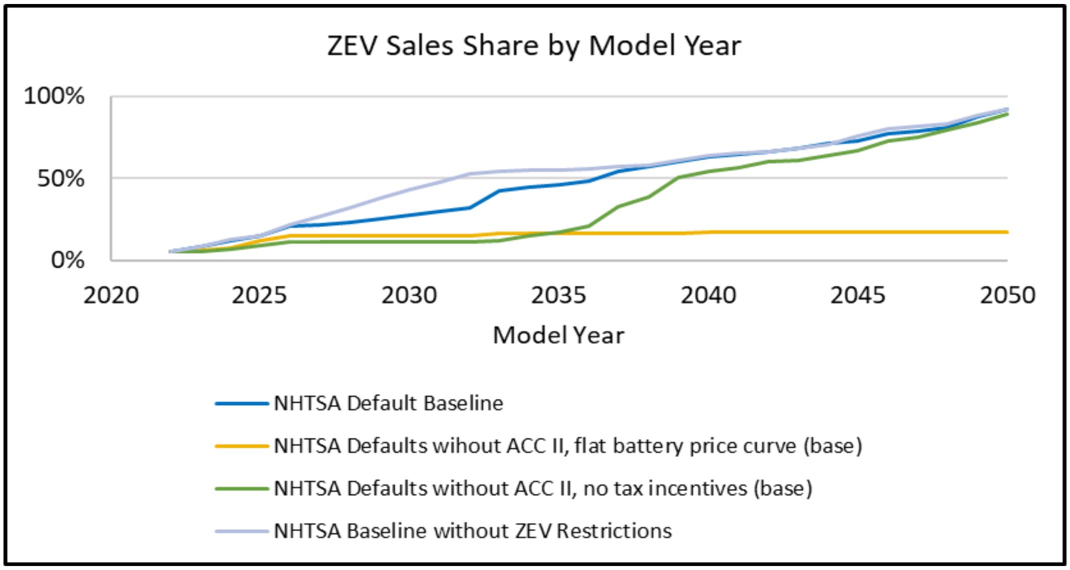
[200] While the Preliminary Regulatory Impact Analysis (PRIA) lacked information on learning curve effects from 2022 through 2050, Figure 9-11 of the PRIA illustrates that from 2022 (reference case) through 2040, NHTSA projects a 43 percent drop in battery cost *before* learning curve impacts other EV components and tax credits are considered. Optimistic assumptions such as this and aggressive cost reductions attributed to learning are what leads to the agency's forecasts of large increase in the sale of ZEVs, suggesting the agency accelerated learning to justify its costs analysis. *See* Appendix B Trinity Technical Review at 13-14.

[201] Appendix B Trinity Technical Review at 16.

**Figure 16: Baseline BEV Sales Fractions by Model Year for the Sensitivity Cases and NHTSA Baseline**




The fact that the other sensitivity analyses eliminating ZEV restrictions and tax incentives predict similar levels of EV sales demonstrates just how vital NHTSA's assumptions regarding projected battery costs are to the forecasts of the future vehicle fleet composition.

The critical mineral markets do not support NHTSA's assumptions. Critical minerals used in battery production experience drastic price volatility. Between January 2021 and March 2022, the cost of lithium increased by 738%.[202] While prices have since declined, price volatility should be expected to continue. Future lithium-ion battery production will be heavily subsidized if the BIL and IRA remain in place, which likely serves as an impediment to actually reducing the cost of the battery. Moreover, 2022 battery costs were $153 per kWh,[203] and cost reduction curves have already begun to flatten out. Indeed, battery costs rose 7 percent in 2022.

Further complicating the projection of future battery prices is the fact that battery raw materials are not commodities, they are classified as specialty chemicals. As such, pricing will not follow traditional commodity pricing structures, especially given where these supplies are geographically concentrated in areas with geopolitical instabilities. Each OEM, cathode or anode producer, and battery manufacturer have their own specifications for the materials, and thus the raw materials must be refined and tested to meet their bespoke specification. Spot markets for battery materials are virtually non-existent and unlikely to develop to maturity in the near term. For example, most lithium contracts are written as long-term agreements, which are based on price indices plus a discount, and sometimes with a floor/ceiling mechanism to hedge against pricing volatility. With the United States and other developing nations' push to electrify transportation and the concomitant need to deploy utility-scale batteries, the demand for lithium

[202] *See* Canada Energy Regulator, "Market Snapshot: Critical Minerals are Key to the Global Transition" (Jan. 18, 2023), *available at* https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/market-snapshots/2023/market-snapshot-critical-minerals-key-global-energy-transition.html.

[203] DOE, "Electric Vehicle Battery Pack Costs in 2022 Are Nearly 90% Lower than in 2008, according to DOE Estimates," (Jan. 9, 2023) *available at* https://www.energy.gov/eere/vehicles/articles/fotw-1272-january-9-2023-electric-vehicle-battery-pack-costs-2022-are-nearly.

(and other critical minerals) is expected to grow exponentially. This need is only magnified by the fact that the minerals used for EV batteries are also essential to other systems and contexts, including solar photovoltaic cells, wind turbines, and hydrogen electrolyzers, as well as supporting multiple traditional uses, such as military defense systems, aerospace, mobile phones, computers, fiber-optic cables, semi-conductors, medical applications, and even bank notes.

Even where OEMs are taking steps to secure domestically sourced minerals and related commodities to supply production for these plants, these projects are speculative and have yet to be permitted, built, or commercialized at scale. As described above in Section III.B.1.d.i, many of these projects simply will not materialize. Ultimately, the volatility of material pricing will have a direct effect on the viability of these battery projects. If they do come to fruition, OEMs will need to increase their prices to ensure a steady supply. Morgan Stanley estimates BEV makers will need to increase prices by 25 percent to account for rising battery prices.[204]

Battery costs will in turn have significant impacts on EV production, operating, and disposal costs. NHTSA's analysis is inadequate and ignores the cost and long-term affordability of battery production.

#### b) NHTSA ignores the increased purchase price of EVs and reduction in consumer choice that will result from its Proposal.

Automakers will inevitably be forced to pass on the increased costs associated with producing EVs, including the cost of sourcing scarce and insecure materials, expanding and developing manufacturing capabilities, and research and development costs. NHTSA fails to consider the very real possibility that many automakers simply will not be able to comply with federal and state regulatory requirements and will be forced to pay civil penalties due to non-compliance. Automakers faced with such scenarios will have no choice but to account for such costs in their pricing strategies. NHTSA's Proposal also fails to evaluate how government credits are embedded in vehicle pricing. For example, neither federal or state governments, nor auto manufacturers explain how state ZEV credits, EPA GHG multiplier credits, and NHTSA CAFE EV multiplier credits are accounted for in both ZEV and ICEV vehicle prices.

There is increasing evidence that regulations mandating ZEV sales—along with the cross-subsidies from gasoline and diesel vehicle buyers—are leading manufacturers to abandon sales of the least expensive and higher fuel economy gasoline and diesel vehicles that do not receive similar subsidization.[205] Cox Automotive found that "in December 2017, automobile makers produced 36 models priced at $25,000 or less. Five years later, they built just 10," pushing low-income buyers out of the new-car market and into the used-car market. Conversely, in December 2017 automobile manufacturers offered 61 models for sale with sticker prices of $60,000 or higher

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[204]James Thornhill, Bloomberg, "Morgan Stanly Flags EV Demand destruction as Lithium Soars" (Mar. 24, 2022), Chart 7, *available at* https://www.bloomberg.com/news/articles/2022-03-25/morgan-stanley-flags-ev-demand-destruction-as-lithium-soars#xj4y7vzkg.

[205] Steven G. Bradbury, Distinguished Fellow, The Heritage Foundation, Prepared Statement for the hearing entitled "Driving Bad Policy: Examining EPA's Tailpipe Emissions Rules and the Realities of a Rapid Electric Vehicle Transition," before the Subcommittee on Economic Grown, Energy Policy, and Regulatory Affairs of the U.S. House of Representatives Committee on Oversight and Accountability, at 10 (May 17, 2023) *available at* https://oversight.house.gov/wp-content/uploads/2023/05/BradburyPrepared-Statement-for-17 -May-2023-Oversight-Hearing. Pdf

and in December 2022, they offered 90.[206] NHTSA and its sister agencies cannot claim they do not affect vehicle price of credits solely because they have not sought to quantify the impact of their policies mandating ZEV sales.

Ultimately, consumers will be faced with significantly fewer choices when purchasing vehicles, particularly affordable ones. The limited supply of affordable EVs typically have a range below 200 miles on a full charge.[207] If consumers want longer range EVs, they will pay a considerable purchase price as seven of the top ten, range-rated EVs cost anywhere from $74,800 to $110,295.[208]

Consumers will also experience increased vehicle sales tax and property tax associated with the higher purchase price of ZEVs (even after myriad subsidy programs).

Even with significant direct and indirect subsidies, ZEVs are more expensive on average than their ICEV counterparts and unaffordable for many households. In the first calendar quarter of 2022, the average price of the top-selling light-duty ZEV in the U.S. was about $20,000 more than the average price of top-selling ICEV.[209] The price disparity has not improved, with the average price of light-duty ZEVs near $66,000 in August 2022 and continuing to rise.[210]

NHTSA must account for the implications of its Proposed Rule, which will result in vehicle price increases across vehicle types while also reducing consumer choice.

#### i. NHTSA's overly optimistic assumptions regarding the IRA do not reflect the true cost to electrify light-duty vehicles

The TSD presents current costs to electrify light-duty vehicles ranging from $3,500 to $6,000 per vehicle.[211] However, this cost is dramatically discounted through the end of 2050 in NHTSA's analysis by applying the battery production tax credit and the vehicle purchase credit from MY 2024 through 2033. As detailed in Trinity's Report, NHTSA assumes the federal battery production tax credit values will increase during 2024 through 2030, and then decrease in 2033.[212]

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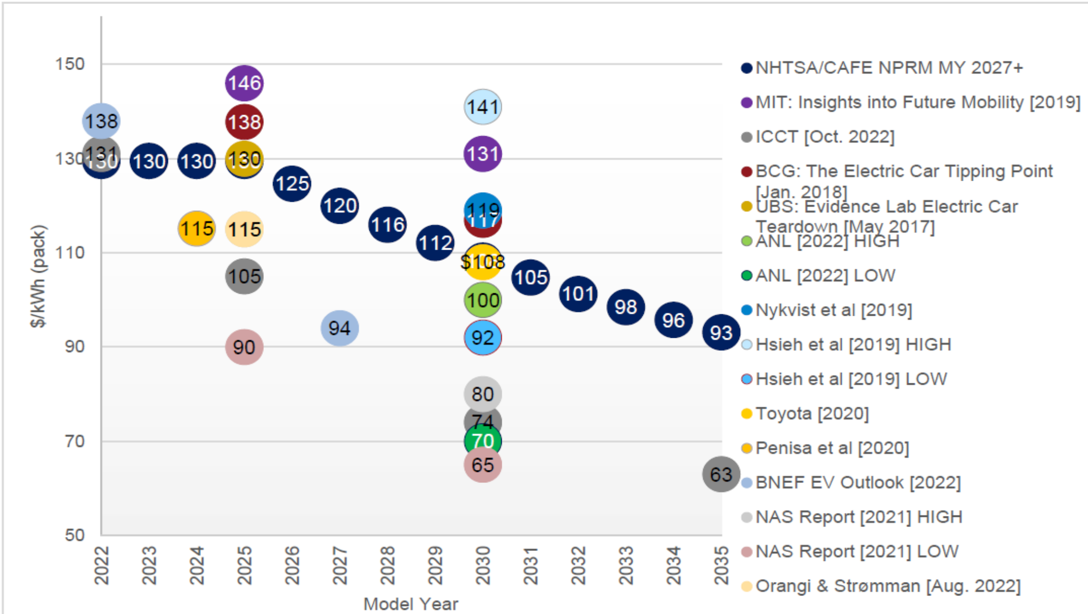
[206] *See* Sean Tucker, Are we witnessing the demise of the affordable car? Automobile makers have all but abandoned the budget market (MarketWatch Feb. 28, 2023), *available at* https://www.marketwatch.com/story/are-we-witnessing-the-demise-of-the-affordable-car-automakershave-all-but-abandoned-the-budget-market-a68862f0 (last visited May 24, 2023).
[207] *See* Sebastian Blanco, *List of EVs Sorted by Range* (Sept. 1, 2022), www.jdpower.com/cars/shoppingguides/list-of-evs-sorted-by-range.
[208] *See* Nicholas Wallace, Austin Irwin, & Nick Kurczewski, *Longest Range Electric Cars for 2023, Ranked* (Mar. 23, 2023), https://www.caranddriver.com/features/g32634624/ev-longest-driving-range/.
[209] Registration-weighted average retail price for the 20 top-selling ZEVs and ICEVs in the U.S. S&P Global, *Tracking BEV prices – How competitively-priced are BEVs in the major global auto markets*? May 2022.
[210] Andrew J. Hawkins, "EV prices are going in the wrong direction," The Verge, August 24, 2022, *available at* https://www.theverge.com/2022/8/24/23319794/ev-price-increase-used-cars-analysis-iseecars (last visited May 24, 2023); *see also* Justin Banner, Latest Ford F-150 Lightning Price Hike Hands Chevy Silverado EV a $20K Advantage–The least-expensive electric F-150 Lightning now costs $4,000 more than it did late last year (Motortrend Mar. 30, 2023), *available at* https://www.motortrend.com/news/2023-ford-f-150-lightning-pro-price-increase-msrp/ (last visited May 24, 2023).
[211] TSD at Table 3-91.
[212] See Appendix B Trinity Technical Review at 13.

NHTSA then applies these tax credits to its assumed battery production costs. *See* Figure 3-32 of the TSD, reproduced below.

**Figure 3-32: Comparing Battery Pack Cost Estimates from Multiple Sources**




NHTSA's application of the tax credits to battery production reduces battery cost during the period they are assumed to be available. While these federal tax credits may lower battery production costs, they may be eliminated, modified, or manufacturers may not pass these cost savings to consumers to offset losses on current EV sales.[213]

NHTSA uses the same framework for the federal clean vehicle tax credit, showing an EV purchase tax credit ranging from $1,000 to $5,000 during 2024 through 2028, and remaining at $5,000 in 2028 through 2033.[214] NHTSA applies these tax credits to current EV cost values of $3,500 to $6,000 per vehicle to dramatically reduce the cost of EVs before the production learning curve takes effect and the battery production tax credits are taken into account.[215] Once again, it is unclear that the federal clean vehicles tax credit will be available at the levels assumed by NHTSA or that they will persist that far into the future.

**c) NHTSA's Proposal does not account for the true total cost of ownership associated with EVs.**

Beyond the increased initial cost to purchase a new EV, consumers may also face other long-term costs associated with owning an EV, including increased electricity demands; increased tax, insurance, repair and battery replacement costs; reduced range capacities; and unpredictable

[213] *See* Luc Olinga, TheStreet, *Ford Loses Nearly $60,000 for Every Electric Vehicle Sold*, (May 2, 2023) *available at* Ford Loses Nearly $60,000 for Every Electric Vehicle Sold – TheStreet (last accessed July 3, 2023).
[214] See Appendix B Trinity Technical Review at 13-14.
[215] *Id.*

(and often unreasonable) charging rates. NHTSA must account and assess these potential costs in its Proposal.

**i. NHTSA's Proposal will disproportionately disadvantage low-income Americans both financially and practically.**

NHTSA did not adequately consider the Proposal's impact on lower income households. While NHTSA recognizes that lower income households typically own older vehicle models,[216] NHTSA must also acknowledge that battery replacement costs are incurred later in a vehicle's lifetime and assess the impact a battery replacement will have on a lower income household. Battery replacements can make the cumulative cost for EV operation and maintenance higher than gasoline or diesel-powered vehicles.[217]

NHTSA assumes EV owners will utilize at home changing, reducing charging costs, the frequency of mid-trip recharging events, and travel-time costs.[218] While many EV owners may opt to install residential charging stations at their homes, this is simply not an option for many Americans. Financial and/or logistical constraints may prohibit many ZEV owners from having accessible EV charging infrastructure at home. For those who simply cannot afford the upfront costs for a new EV or pay higher public charging rates, they may end up retaining older ICEVs for longer.

It may not be economically feasible for many EV owners to charge using public DCFC equipment. About one-third of the U.S. population lives in multi-unit housing[219] and they would likely rely on recharging their vehicle at commercial DCFC stations. "Electricity purchased at a public charger can cost five to ten times more than electricity at a private one."[220] Those who cannot afford private charging will end up paying vastly more for a re-charge than the wealthy. These costs to lower income and commercial EV users are not acknowledged in the Draft TSD. According to one article that explains the different costs of recharging BEVs, using a publicly available DCFC system is the most expensive way to recharge a BEV costing 60% more than refueling a similarly sized ICEV.[221] Car and Driver put it this way: "[I]f you're buying an electric car to save on fuel costs, make sure you plug in at home."[222] Lower-income consumers also cannot afford to install solar photovoltaics, which proponents claim will allow EVs to be charged at home with emissions-free electricity.[223]

NHTSA must also account for increased overall EV ownership costs due to current state excise tax policies and insurance that establish higher costs for EV owners. Insurance premiums

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216 88 FR 56,373 (August 17, 2023).
217 Furch, J., Konečný, V. & Krobot, Z. Modelling of life cycle cost of conventional and alternative vehicles. *Sci Rep* 12, 10661 (2022). https://doi.org/10.1038/s41598-022-14715-8
218 Draft TSD Chapter 6.1.4.1 Value of Travel Time Savings, 6-6.
219 *See* https://www.census.gov/population/www/cen2000/censusatlas/pdf/14_Housing.pdf (accessed 2/17/20).
220 *Id*.
221 Jim Gorzelany, "What it Costs to Charge and Electric Vehicle," https://www.myev.com/research/ev-101/what-it-costs-to-charge-an-electric-vehicle, accessed January 31, 2021.
222 *See* "Our Tesla Model 3 Proves EVs Are Cheaper When Charged at Home," Car and Driver, January 11, 2021, https://www.caranddriver.com/news/a35152087/tesla-model-3-charging-costs-per-mile/.
223 Jonathan A Lesser, Short Circuit: The High Cost of Electric Vehicle Subsidies 4, Manhattan Institute (May 15, 2018), *available at* https://media4.manhattan-institute.org/sites/default/files/R-JL-0518-v2.pdf.

for PEVs are typically higher than comparable ICEVs because of higher repair and parts costs. The price premium depends on the make and model, age of the driver, geographic location, and state. According to ValuePenguin, insurance on a PHEV, depending on the model, could be 19 percent to 32 percent higher than comparable ICEV.[224] Another estimate from an Oct 2022 study from Self Financial concludes PEVs' annual insurance is $1,674, $442 more compared to an ICEV annual insurance premium of $1,232.[225]

Low-income Americans will be affected by a litany of additional increases associated with the cost of owning an EV, including taxes, higher insurance rates, and limited availability of replacement parts and qualified mechanics. On top of this, EVs with longer range capabilities cost significantly more—middle- and low-income Americans will not be able to afford EVs with longer range capacities, ultimately requiring them to pay more to charge low-range vehicles more frequently. While overall cost of ownership will increase with EVs, Americans will also be faced with significantly reduced consumer choice when purchasing vehicles. As described above, regulations that outright or implicitly require EV sales, like NHTSA's proposal here, are the primary drivers in manufacturers abandoning their less expensive and higher fuel economy gasoline and diesel vehicles. NHTSA must account for this trend toward eliminating affordable vehicles. Though EVs will play a role in the future automotive markets, their acceptance should be market driven by consumer choice, not by government regulation.

#### ii. NHTSA has not adequately weighed the factors affecting liquid and electric fuel prices.

NHTSA must also consider the relative differences in fuel prices that consumers will face. EVs do not achieve a real-world fuel economy that is equivalent to the agency's applied fuel economy test methods. As noted in the environmental benefits discussion below, NHTSA's Proposal is based on performance data estimates of ICEV fuel economy using EPA's "5-cycle method." If NHTSA's analysis were based on real-world fuel economy testing of EVs, it would show they use vastly higher amounts of electricity to travel the same distance, with a corresponding increase in ZEV owner costs for electricity and ZEV maintenance and battery replacement. NHTSA must account for these real costs.

In reality, EVs have less range than ICEVs, both technically and practically. As noted by J.D. Power, "the majority of EVs provide between 200 and 300 miles of range on a full charge."[226] One study shows that the average 3-year-old electric car is driven 9,059 miles per year, compared with 12,758 miles for ICEVs.[227] Other research suggests EVs travel only 5,300 miles per year.[228] NHTSA's analysis assumes a longer battery life than is currently achieved, as NHTSA does not factor in battery replacement costs or the environmental implications of additional battery

[224] Dillon Leovic, "How Much Does Electric Car Insurance Cost?," ValuePenguin, June 1, 2023, *available at* https://www.valuepenguin.com/how-having-electric-car-affects-your-auto-insurance-rates.
[225] "Electric Cars vs Gas Cars Cost in Each State," Self Financial, *available at* https://www.self.inc/info/electric-cars-vs-gas-cars-cost/.
[226] *See* Sebastian Blanco, List of EVs Sorted by Range (Sept. 1, 2022), www.jdpower.com/cars/shoppinqquides/list-of-evs-sorted-by-ranqe.
[227] iSeeCars, *The Most and Least Driven Electric Cars* (May 22, 2023), https://www.iseecars.com/mostdriven-evs-study.
[228] Burlig, F., Bushnell, J., Rapson, D., Wolfram, C., "Low Energy: Estimating Electric Vehicle Electricity Use," National Bureau of Economic Research Working Paper 28451, http://www.nber.org/papers/w28451.

production, recycling, and disposal. Additionally, charging downtime and range limits of EVs will likely reduce vehicle operation time. Therefore, commercial enterprises, including small businesses, using EVs will need to deploy more vehicles to provide the same level of service currently provided by ICEVs. NHTSA must accurately account for the difference in vehicle miles traveled by EVs.

NHTSA must also consider realistic retail fuel costs for EVs as compared to liquid fuels. EV owners will not pay the national average residential electricity price to charge their vehicles. The majority of EVs in the U.S. are located in utility service territories with some of the highest electricity rates in the country such that the average EV owner currently pays a much higher price to charge their EV at home than the national average residential electricity rate. Given that EV penetration has varied widely across the U.S., it would be arbitrary to assume that EVs will, unlike in the past, penetrate uniformly across the U.S. and thus that the average electricity price would be representative of the actual cost of electricity. For example, California, which has roughly 40 percent of all registered EVs in the U.S., has a residential electricity rate that is roughly double the national average. Moreover, the assumed EV penetration rates will necessarily require exponential increases in commercial EV charging at rates that are significantly higher than the current national average residential electricity rate, depending on location and charging speed. Those customers who are not homeowners and not able to install their own charging stations and take advantage of charging at low-cost times will be adversely impacted. A true assessment of fuel costs must consider both commercial and residential rates for electricity, as well as peak power or time of use charges. For example, California electric prices rose 42 percent - 78 percent between 2010 and 2020 and are projected to rise an additional 50 percent by 2030 as shown in Figure 17.

**Figure 17: Historical and Forecasted Electricity Rates for California**[229]


For example, California's ZEV mandates have contributed to the inflationary impacts on energy prices and on jobs in certain industries related to traditional fuels and vehicles. According

[229] Michael Shellenberger, Twitter (citing California Public Advocate's Office data), *April 27, 2021*.

to a 2021 California Public Advocates Office presentation to the California Public Utilities Commission, “it is already cheaper to fuel a conventional internal combustion engine (ICE) vehicle than it is to charge an EV” in the San Diego Gas & Electric Co. service area.[230] This is astonishing given that gasoline prices in California are the second highest in the nation, averaging approximately $4.01 per gallon of gasoline at the time in 2021. According to an Anderson Economic Group article, entry-priced, gas-powered cars were significantly more affordable to fuel at $9.78 per 100 "purposeful miles" compared to the $12.55 at-home charging costs for an entry-priced EV. Future projections afford consumers no relief, as the California Energy Commission projects that both commercial and residential electricity prices will continue to rise, reaching nearly $7 per gasoline-gallon equivalent for the commercial sector. Similarly, many in the Boston-Cambridge-Newton area paid $0.34 per kWh in April 2023, which was nearly 107% higher than the national average.[231]

Heaping additional demand for EV charging into this market could exacerbate already high electricity prices. This will be especially impactful to lower-income homeowners who may not be able to install dedicated charging units, forcing them to pay more out of pocket for charging during peak demand periods.[232]

Finally, charging pricing has been unpredictable, with some stations charging by the minute instead of charging for electricity consumed.[233] Other charging stations offer multiple subscription plans or charge different rates at various times of day, resulting in significant price increases over the past few months.[234] Boston charging companies raised charging fees in response to New England utilities increasing their rates to 39 cents per kilowatt-hour in February 2023, from 27 cents a year earlier.[235] Additionally, many ZEV owners will be forced to install their own residential charging stations, which have significant upfront costs (not to mention the added ongoing electrical costs to actually charge the vehicle).

NHTSA must revise its analysis to account for realistic electricity prices. NHTSA’s underlying EV assumptions will require an enormous investment in power generation and distribution, resulting in nationwide increases in electricity bills that NHTSA has not considered. Of course, considering the additional trillions of dollars in costs would paint a clear picture that the costs of the Proposal far exceed its inflated benefits (see Section III.B.2.d below).

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230 California Public Utilities Commission, “Utility Costs and Affordability of the Grid of the Future” (May 2021). Presentation from Mike Campbell, Public Advocates Office at 116-117 available at https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/office-of-governmental-affairs-division/reports/2021/senate-bill-695-report-2021-and-en-banc-whitepaper_final_04302021.pdf.

**231** U.S. Bureau of Labor Statistics, Northeast Information Office, Average Energy Prices, Boston-Cambridge-Newton—April 2023, available at https://www.bls.gov/regions/northeast/news-release/averageenergyprices_boston.htm#:~:text=Source%3A%20U.S.%20Bureau%20of%20Labor,of%2016.5%20cents%20per%20kWh.

232 Hardman, Scott, et al., “A Perspective on Equity in the Transition to Electric Vehicles.” *MIT Science Policy Review*, (Aug. 20, 2021), *available at* https://sciencepolicyreview.orq/2021/08/equity-transitionelectric-vehicles/ (accessed June 29, 2023).

233 Aaron Pressman, “Inside the crazy, mixed-up world of electric-vehicle charger pricing,” The Boston Globe, March 27, 2023. Available at https://www.boston.com/news/the-boston-globe/2023/03/27/electricvehicle-charger-pricing.

234 *Id*.

235 *Id*.

### iii. NHTSA's Proposal will lead to cross-subsidization, shifting costs associated with increased EV penetration rates to those purchasing ICEVs.

While the purchase price differential between comparable ICEVs and EVs may be relevant for forecasting consumer demand, it does not reflect the true costs of the ZEVs required under the Proposed Rule. A ZEV typically costs tens of thousands of dollars more to produce than a comparable ICEV due primarily to the surging costs of critical minerals and resulting high costs of batteries.[236] McKinsey & Company found that EV manufacturers "do not make a profit from the sale of EVs. In fact, these vehicles often cost $12,000 more to produce than comparable vehicles powered by internal-combustion engines (ICEs) in the small- to midsize-car segment and the small-utility-vehicle segment. What is more, carmakers often struggle to recoup those costs through pricing alone. The result: apart from a few premium models, OEMs stand to lose money on almost every EV sold, which is clearly unsustainable."[237] Additionally, the practical effect of NHTSA's Proposed Rule will force manufacturers to sell increasing numbers of ZEVs each year that goes far beyond the consumer demand for the product at its true cost. Manufacturers will be forced to incentivize ZEV purchases through a practice called cross-subsidization.

Automobile cross-subsidization is a pricing strategy to spread the high cost of ZEVs across a manufacturer's other product offerings. Under this pricing convention, manufacturers set the prices of certain ICEVs higher than their production costs to generate additional profits that can then be used to offset losses incurred by selling ZEVs below their actual production costs. This operates as a hidden tax on ICEVs and results in the purchasers of ICEVs subsidizing the sale of ZEVs. Without cross-subsidies, manufacturers simply cannot achieve the assumed ZEV penetration rates. This means that even those who are completely unwilling to pay for EVs still pay for them in part by absorbing a markup on ICEV costs. These cross-subsidies are effectively a tax imposed on all those choosing not to purchase electrified vehicles.

While opaque, the magnitude of ZEV cross-subsidies is significant.[238] Ford's decision to report ZEV financial information separately beginning in 2023 provides an additional glimpse into

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[236] *See* PCMag, Profit vs. the Planet, (Sept. 26, 2022), Profit vs. the Planet: Here's Why US Automakers Are All-In on Electric Vehicles I PCMag *last accessed* July 3, 2023 ("EVs are currently more expensive to manufacture than gas-powered vehicles because of spiking battery costs. The cost of lithium, the main ingredient, has skyrocketed since demand far exceeds the number of working mines that can supply it.").
[237] McKinsey & Company. March 2019. https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/making-electric-vehicles-profitable.
[238] NHTSA's methodology ignores current EPA, DOE, NHTSA, and state regulations that add hundreds of billions of dollars in costs of ICEVs to cross-subsidize buyers of ZEVs. These cost transfers are in the form of: (1) state-mandated ZEV credit payments from ICEV manufacturers (i.e., ICEV buyers) to ZEV manufacturers (i.e., ZEV buyers); (2) current and future potential EPA GHG ZEV multiplier credit payments from ICEV manufacturers (i.e., ICEV buyers) to ZEV manufacturers (i.e., ZEV buyers); and, (3) NHTSA-mandated fuel economy ZEV multiplier credit payments from ICEV manufacturers (i.e., ICEV buyers) to ZEV manufacturers (i.e., ZEV buyers). A NHTSA presentation suggests that NHTSA EV multiplier credits alone subsidize each EV by more than $25,000, increasing the true average cost of every EV sold to over $90,000. See https://www.nhtsa.gov/sites/nhtsa.gov/files/2015sae-powellaltfuels cafe. pdf; https://www.nhtsa.gov/sites/nhtsa.gov/files/2022-04/Model-Documentation CAFE-MY-2024-2026 v1-tag.pdf; https://one.nhtsa.gov/cafepic/home/ldreports/manufacturerPerformance. Per the NHTSA information above, since MY2017 standards were -35mpg and MY2017 Tesla FE performance (with multipliers) was 518.7 mpg, and since Tesla sold -46,979 MY2017 vehicles in the U.S., then Tesla in

the magnitude of cross-subsidization. Ford lost approximately $58,000 for each ZEV car it sold during the quarter.[239] While cross-subsidization, tax credits, emissions trading, and other ZEV subsidies may hide the true costs of a ZEV mandate from consumers, NHTSA has a duty to quantify and present those costs that are attributable to the Proposed Rule. Pursuant to Executive order 12866:

> NHTSA must "assess all costs and benefits of available regulatory alternatives, including the alternative of not regulating. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nonetheless essential to consider.[240]

Ignoring actual ZEV production costs, including credit trading costs, is unreasonable.

NHTSA ignores this real-world regulatory compliance pricing scheme. As noted above, E.O. 12866 requires NHTSA to be a neutral decisionmaker and to fairly assess the costs and benefits of this Proposal. The Agency has not met its obligations under relevant Executive Orders, the Administrative Procedure Act, or EPCA, which requires NHTSA to consider "economic practicability" when deciding maximum feasible average fuel economy standards. NHTSA has instead understated the costs of this Proposal.

NHTSA must account for these real-world costs and communicate to the public that these cross-subsidies must be paid for by a shrinking number of ICEV buyers and, therefore, must significantly increase the average price of EVs. As ZEV prices rise, their sales and ICEV fleet turnover will slow, reducing fuel efficiency benefits and creating a significant drag on the economy.

**d) NHTSA failed to adequately account for the total cost required to upgrade and expand the grid.**

Notably absent from NHTSA's analysis is any demonstration that sufficient utilities and other infrastructure needed to support the EV penetration assumptions in NHTSA's baseline calculation and its modeling considerations will actually be available. In fact, grid resiliency is at risk of further deterioration due to increasing power demand from electrification, not just in transportation.

As described in more detail in Section III.B.1.b.i, significant regional power demands resulting from increased EV penetration rates will greatly stress the U.S. energy and transmission

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MY2017 generated 227 million excess credits. If the market-value of these credits is -$5.50 per 0.1 mpg shortfall per vehicle under the MY2017 CAFE standard of-35 mpg, then these credits were worth approximately $1.25 billion, or $26,600 per EV that Tesla sold. [Calculation of estimated value: Credits= (518. 7 - 35) x 46979 x 10 x CAFE Penalty of $5.50 per 0.1 mpg shortfall per vehicle]. Tesla may have banked, traded, or sold these credits. Tesla MY2022 sales in the U.S. were 484,351 and the CAFE civil penalty is now $15 per 0.1 mpg shortfall per vehicle.

[239] *See* Luc Olinga, TheStreet, *Ford Loses Nearly $60,000 for Every Electric Vehicle Sold*, (May 2, 2023) *available at* Ford Loses Nearly $60,000 for Every Electric Vehicle Sold - TheStreet (last accessed July 3, 2023).

[240] E.O. 12866, Section 1(a), Sept. 30, 1993.

grid. There is insufficient time and inadequate materials supply to expand and upgrade the grid as needed to support these rates. Even if such upgrades were possible, doing so would be cost prohibitive. NTHSA has not accounted for the significant costs associated with expanding and upgrading the grid in light of these significant materials and timing constraints. NHTSA must consider the increase in the cost of electricity to consumers (whether EV owners or others) associated with the Proposed Rule. The U.S. needs to invest an estimated $4.5 trillion to fully transition the U.S. power grid to renewables during the next 10-20 years.[241] The cost of grid upgrade projects needed to support the incremental electricity demand growth from transportation is significant and can be quite variable. A particular case study of Northern California illustrated in 10P Science notes: "[T]he total cost of these upgrades will be at least $1 billion and potentially more than $10 billion" for a service area of 4.8 million electricity customers.[242] These costs need to be taken into consideration with expected demand growth, within detailed rate base calculations, and in concert with appliance upgrade costs to fully understand their ultimate impact on annual ratepayer expenditures.

Even where energy expansion and upgrade projects are contemplated or proposed, these complex projects often fail to materialize. While the Lawrence Berkley National Laboratory reports strong interest in clean energy, increasing delays in studying, building, and connecting new energy projects to the grid means that "much of this proposed capacity will not ultimately be built."[243] The high-rate project withdrawal is reflected in the fact that only 21 percent of the projects (representing 14 percent of capacity) seeking connection from 2000 to 2017 were constructed as of the end of 2022.[244] Other challenges cited by the Berkeley National Lab that prevent timely operation of new renewable energy projects include increased interconnection wait times, reaching agreements with landowners and communities, power purchasers, supply chain constraints, and financing.[245] In sum, NHTSA has given insufficient consideration to the significant cost barriers to the grid updates that would be required by the Proposed Rule.

**e) NHTSA overlooks the significant costs of installing required charging capacity.**

NHTSA must also consider the costs to build the charging infrastructure required to support the assumed EV penetration rates. Even as new EVs are ready to enter into production, auto industry representatives have acknowledged the necessary infrastructure for electric vehicles continues to lag.[246] In 2020, there were a total of 103,582 publicly available non-proprietary charging outlets in U.S. (30 percent of which are located in 14 counties) for 3.04 million EVs on the road, a ratio of 29 EVs per charger.[247] In 2022, 51 percent of all new chargers were added in 2 percent of U.S. counties, with California adding 25 percent of the 2022 new charging

[241] Dan Shreve and Wade Schauer, *Deep decarbonization requires deep pockets* (June 2019), https://www.decarbonisation.think.woodmac.com/.
[242] Salma Elmallah et al., IOP SCIENCE, "Can distribution grid infrastructure accommodate residential electrification and electric vehicle adoption in Northern California?" (Nov. 9, 2022), *available at* https://iopscience.iop.org/article/10.1088/2634-4505/ac949c.
[243] Berkeley Lab, *Electricity Markets and Policy: Queued Up: Characteristics of Power Plants Seeking Transmission Interconnection*, https://emp.lbl.gov/gueues (last visited June 9, 2023).
[244] *Id*.
[245] *Id*.
[246] ALLIANCE FOR AUTOMOTIVE INNOVATION, "Get Connected Electric Vehicle Quarterly Report" (Fourth Quarter 2022).
[247] *Id.*

capacity and 160 counties adding only one charger.[248] And the pace of installing new public chargers is not keeping up with current and projected EV sales, as the ratio of registered EVs to new chargers in 2022 was 38 to one.[249]

A 2023 EV Charging Station Report based on DOE's Alternative Fuel Data Center data highlights as the number of ZEVs in the U.S. increased by 42 percent, but the growth in public charging outlets increased by only 12 percent during the same time.[250] According to S&P Global's Mobility Special Report, U.S. charging infrastructure is not nearly robust enough to fully support a maturing electric vehicle market, and ZEV charging stations will need to quadruple between 2022 and 2025 and grow more than eight-fold by 2030.[251] There is lower investment into charging systems outside of major metro markets.[252] Of the 3,100 counties and city-counties in the U.S., 63 percent had five or fewer chargers installed; 39 percent had zero; and 53 percent of counties added no new chargers in 2022.[253]

NHTSA must also consider the cost of power distribution upgrades needed for EVSE installation. The National Renewable Energy Laboratory ("NREL") published new estimates of the need for ZEV charging infrastructure investment that finds:

> A cumulative national capital investment of $53—$127 billion in charging infrastructure is needed by 2030 (including private residential charging) to support 33 million PEVs. The large range of potential capital costs found in this study is a result of variable and evolving equipment and installation costs observed within the industry across charging networks, locations, and site designs. The estimated cumulative capital investment includes:
>
> - $22—$72 billion for privately accessible Level 1 and Level 2 charging ports

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[248] Id.
[249] Id.
[250] ZUTOBI, "2023 EV Charing Station Report: State-by-State Breakdown" (June 16, 2023) *available at* https://zutobi.com/us/driver-guides/the-us-electric-vehicle-charging-point-report.
[251] S&P Global Mobility. "EV Chargers: How Many Do We Need?" *News Release Archive*, (Jan. 9, 2023), https://press.spglobal.com/2023-01-09-EV-Chargers-How-many-do-we-need (accessed June 28, 2023).
[252] S&P Global Mobility. "EV Chargers: How Many Do We Need?" *News Release Archive*, (Jan. 9, 2023), https://press.spglobal.com/2023-01-09-EV-Chargers-How-many-do-we-need, (accessed June 28, 2023). Currently EV charging is concentrated in high-income urban areas in California, Colorado, Massachusetts, Maryland, New Jersey, New York, and Oregon. Phillipp Kampshoff, et al., McKinsey & Co., "Building the electric-vehicle charging infrastructure America needs" (Apr. 18, 2022) *available at* https://www.mckinsey.com/industries/public-sector/our-insights/building-the-electric-vehicle-charginginfrastructure-america-needs.
[253] Alliance for Automotive Innovation. *Get Connected Electric Vehicle Quarterly Report, Fourth Quarter 2022*. *See also* S&P Global Mobility. "EV Chargers: How Many Do We Need?" *News Release Archive*, 9 Jan. 2023, https://press.spglobal.com/2023-01-09-EV-Chargers-How-many-do-we-need. Accessed 28 June 2023 (Texas currently has about 5,600 Level 2 non-Tesla and 900 Level 3 chargers, but by 2027 S&P Global Mobility forecasts the state will need about 87,500 Level 2 and 7,800 level 3 chargers – more than ten times the current number of Level 2 and 3 chargers - to support an expected the expected 1.1 million EVs at that time).

- $27—$44 billion for publicly accessible fast charging ports
- $5—$11 billion for publicly accessible Level 2 charging ports.[254]

Given a general linear relationship between EV charging infrastructure costs and the number of registered ZEVs, it is reasonable to estimate (using the DOE numbers) a cost added for charging infrastructure to each EV of (at least) $1,606 to $3,848.

The BIL provides up to $7.5 billion to install 500,000 public chargers nationwide by 2030. "However, even the addition of half a million public chargers could be far from enough. In a scenario in which half of all vehicles sold are EVs by 2030—in line with federal targets—McKinsey estimates that America would require 1.2 million public ZEV chargers and 28 million private EV chargers by that year.[255] All told, the country would need almost 20 times more chargers than it has now."[256] NHTSA must address charger investment and reliability by more than just referencing EV subsidies in recent legislation.

Moreover, NTHSA must consider the costs to businesses to install and operate such chargers. Current office buildings, parking lots, apartment buildings, municipal buildings, and town centers will need to be retrofitted with adequate charging stations.

**f) NHTSA does not adequately evaluate the Proposal's impact on fuel tax revenue (Highway Trust Fund).**

NHTSA does not adequately account for infrastructure impacts from increased operation of heavier EVs on the road including road and bridge deterioration and commensurate reduced funding for infrastructure from fuel tax collections. The Highway Trust Fund (HTF), established by the Highway Revenue Act of 1956, is the source of federal revenue for the construction and maintenance of our nation's roads and bridges. The HTF is primarily funded by a federal fuel tax on each gallon of gasoline and diesel fuel. See Figure 18.

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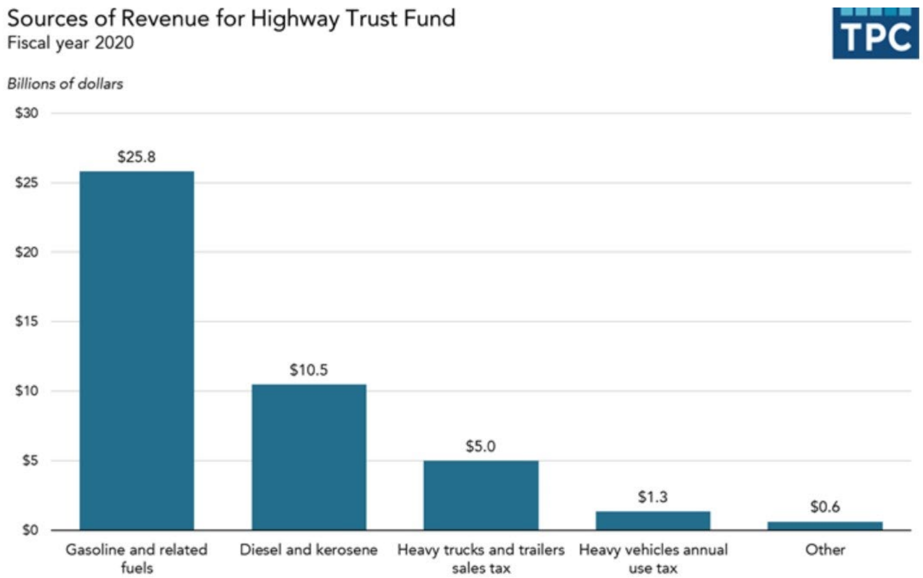
[254] National Renewable Energy Laboratory, *The 2030 National Charging Network: Estimating U.S. LightDuty Demand for Electric Vehicle Charging Infrastructure*, June 26, 2023, at vii. *Available at* https://www.nrel.gov/docs/fy23osti/85654.pdf.

[255] McKinsey, "Building the Electric Vehicle Charging Infrastructure America Needs," (Apr. 18, 2022), *available at* America's electric-vehicle charging infrastructure I McKinsey: *see also* S&P Global, "EV Chargers: How Many Chargers DO We Need?, (Jan. 9, 2023) (millions of chargers are needed).

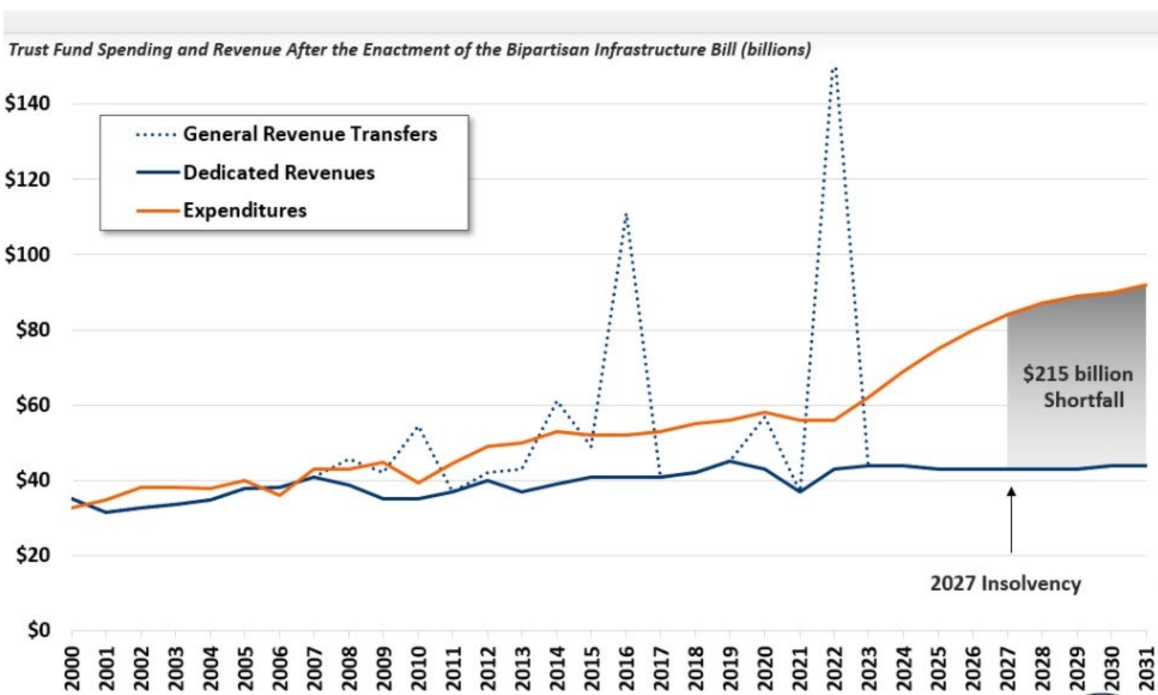
[256] *Id.*

**Figure 18: Revenue Sources for Highway Trust Fund**[257]




Although the Bipartisan Infrastructure Law (BIL) included a one-time deposit into the HTF, the fact remains that spending dramatically outpaces revenue, calling into question the HTF's solvency past 2027.

**Figure 19: HTF Spending and Revenue after the BIL**[258]

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257 Congressional Budget Office, The Budget and Economic Outlook 2020 to 2030, January 2020.

258 Committee for Responsible Federal Budget, based on Congressional Budget Office data. Available at https://www.crfb.org/blogs/infrastructure-bills-impact-highway-trust-fund.

As of July 2023, taxes and other fees on retail gasoline and diesel fuel, in cents per gallon, are:

| | Gasoline[259] | Diesel |
|---|---|---|
| Federal | 18.40 | 24.40 |
| Average of total state taxes | 32.26 | 34.20 |

Because EVs are heavier than ICEVs of similar size and class, they can have a greater impact on road wear.[260] Yet, because they do not consume liquid fuel, EV drivers do not pay a tax that contributes to the HTF. According to NHTSA, the proposed CAFE standards, if implemented, would reduce gasoline consumption by “88 billion gallons relative to baseline levels for passenger cars and light trucks, and by approximately 2.6 billion gallons relative to baseline for HDPUVs through calendar year 2050.”[261] Applying the current fuel tax rates to NHTSA’s estimated reduction in fuel consumption for passenger cars and HDPUVs, the HTF would lose $16.192 billion dollars in lost gasoline tax revenue, and $634 million in lost diesel fuel revenue between 2027-2050. Any economic assessment must factor in the significant financial loss. The vast economic and political impact of NHTSA’s Proposal triggers the major question doctrine.

#### g) NHTSA lacks authority to mandate EVs

For all the reasons described above, NHTSA’s fails to adequately consider the true costs of its Proposal and seeks to force a transformational shift to electric vehicles despite clearly lacking the authority to do so. NHTSA’s Proposed Rule amounts to a *de facto* electric vehicle mandate since automakers will be forced to produce more electric vehicles in order to meet the proposed standards. The forced electrification of the Nation’s vehicle fleet would have vast economic and political significance, triggering the major-questions doctrine. NHTSA must therefore point to clear congressional authorization to effectively mandate electric vehicles, which it cannot do.

The question of whether this shift is necessary and, if so, how to accomplish this shift, is a “major question” reserved for Congress, not NHTSA. The “major questions doctrine” holds that Congress must “speak clearly when authorizing an agency to exercise [such] powers” of “vast economic and political significance.”[262] This doctrine applies in the context of environmental regulation. Last year, in *West Virginia v. EPA*, the Supreme Court relied on the major questions doctrine in holding that the EPA exceeded its statutory authority in adopting its Clean Power Plan.

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[259] U.S. Energy Information Agency, Frequently Asked Questions: “How Much Tax Do We Pay on a Gallon of Gasoline and a Gallon of Diesel Fuel? Available at https://www.eia.gov/tools/faqs/faq.php?id=10&t=10.

[260] Low, J.M., Haszeldine, R.S. & Harrison, G.P. The hidden cost of road maintenance due to the increased weight of battery and hydrogen trucks and buses—a perspective. *Clean Techn Environ Policy* 25, 757–770 (2023), accessed at https://doi.org/10.1007/s10098-022-02433-8.

[261] 88 Fed. Reg. at 56,132.

[262] *Nat'l Fed. Of Indep. Bus. v. Dep't of Labor*, 142 S. Ct. 661 ,665 (2022); see also *Ala. Assoc. of Realtors v. Dep't of Health & Human Servs.*, 141 S. Ct. 2485, 2489 (2021); *Utility Air Regulatory Group v. EPA*, 573 U.S. 302, 324 (2014); *U.S. Telecom Assoc. v. FCC*, 855 F.3d 381, 419-21 (D.C. Cir. 2017) (Kavanaugh, J., dissenting from denial of rehearing *en banc*) (explaining provenance of "major rules doctrine").

That regulation sought to impose caps on GHG emissions by requiring utilities and other providers to shift electricity production from coal-fired power to natural gas and then to renewable energy in place of imposing source-specific requirements reflective of the application of state-of-the-art emission reduction technologies.[263] As noted by the Court, EPA "announc[ed] what the market share of coal, natural gas, wind, and solar must be, and then require[d] plants to reduce operations or subsidize their competitors to get there."[264] EPA's attempt to devise GHG emissions caps based on a generation-shifting approach would have had major economic and political significance impacting vast swaths of American life and substantially restructured the American energy market; however, EPA's purported authority was only based on a "vague statutory grant" within Section 111(d) of the Clean Air Act—far from the "clear authorization required by [Supreme Court] precedents.[265] The need for clear congressional authorization for such sweeping regulatory programs is nothing new —the Supreme Court recently reaffirmed the major questions doctrine "as an identifiable body of law that has developed over a series of significant cases spanning decades."[266]

NHTSA's Proposed Rule here presents an analogous situation, albeit one with substantially greater costs. A *de facto* EV mandate that requires a rapid shift from ICEV to EV will reshape the American automotive market with profound collateral effects, making clear that NHTSA is encroaching upon an issue of "vast economic and political significance." As discussed throughout this comment, the Proposal's direct compliance costs are enormous—even in the face of numerous errors and oversights in its analysis that materially understate these costs.

NHTSA has proposed this de facto mandate despite lacking statutory authorization to do so. As described above in Section III.A, Congress specifically prohibited NHTSA, the agency tasked with setting fuel-economy standards, from even considering electric vehicles when setting those standards. In addition to protecting Congress's incentives, Section 32902(h)(1) also prevents NHTSA from seizing authority over a major policy issue that Congress has not given it. Indeed, Congress has not only failed to clearly authorize NHTSA to set fuel-economy standards that effectively mandate electric vehicles; Congress has expressly forbidden NHTSA to do so. Yet NTHSA seeks to bake these ultra vires electric vehicle mandates into federal fuel-economy standards by incorporating them into the "baseline" fleet it uses to assess the average level of fuel economy that manufacturers can feasibly achieve and incorporating them into the modeling used for setting the proposed standards.

As described in Section III.3.a, relying on other state and federal electric-vehicle mandates is unlawful, and it's arbitrary and capricious because it puts NHTSA's rulemaking in a tenuous position. If a party successfully challenges any one of those laws, then NHTSA's rule will fail to reflect "reality," as it will have been set based on manufacturers' presumed compliance with unlawful standards. This practical problem further confirms that Congress did not permit NHTSA to incorporate other entities' electric-vehicle mandates into fuel economy rules. And it provides an

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[263] *West Virginia v. EPA*, 142 S. Ct. 2587 (2022).
[264] *Id*. at 2613, n4.
[265] *Id*. at 26,14.
[266] *Biden v. Nebraska*, No. 22-506, slip op. at 23 (June 30, 2023) (internal quotations omitted) (applying major questions doctrine to strike down student loan repayment program that will cost taxpayers approximately $500 billion and affects nearly every student loan borrower). Just as the trade-offs inherent in a mass debt cancelation program are ones that Congress would likely have reserved for itself, *id*., slip op. at 25, so too are those that must be considered for the mass adoption of electric vehicles.

independent ground for invalidating NHTSA's rule in the event that California's zero-emission-vehicle mandate, or its adoption by one or more of the Section 177 States, is determined to be unlawful. If some of the electric-vehicle-forcing laws incorporated into NHTSA's baseline are overturned, then even NHTSA's "reality" rationale would evaporate: it would be NHTSA's fuel-economy standards themselves, and not just preexisting state standards, that would require additional electrification of the Nation's vehicle fleet.

There are several issues included in the Proposed Rule with impacts that go well beyond NHTSA's expertise, and the Agency is not positioned to fully grapple with the consequences that such a rapid push for EVs will have across the nation. Beyond the obvious impacts to consumer automotive markets, the Proposed Rule will also eliminate American jobs in the refining sector and significantly strain the electric grid, requiring utilities to rapidly increase generation, transmission, and distribution capacity to a degree not fully contemplated by NHTSA. And it will have profound impacts on national security by forcing the American automotive industry and a large share of the domestic transportation market to depend on critical minerals from foreign suppliers—most notably, China—rather than a domestically-abundant and secure resource. NHTSA's rule goes beyond its statutory authority to propose standards that would require drastic changes that were not contemplated or provided for by Congress. Because the Proposed Rule raises a major question, NHTSA can only proceed if Congress clearly authorized it to do so. However, Congress has explicitly prohibited NHTSA from doing so.

#### 3. The proposed standards do not adequately or correctly consider other government standards impacting motor vehicles.

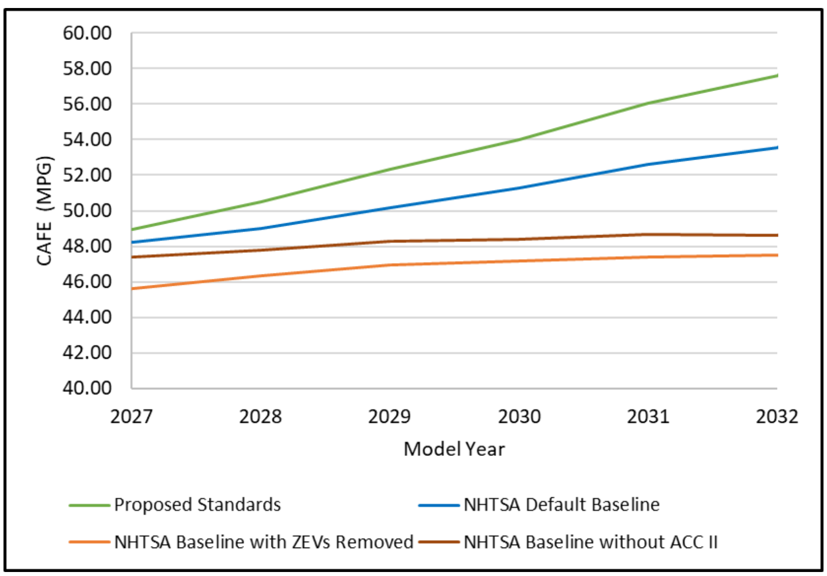
In determining maximum feasible fuel economy standards, NHTSA must also consider "the effect of other motor vehicle standards of the Government on fuel economy."[267] NHTSA has conveniently interpreted this statutory directive in a manner that allows the Agency to include overinflated EV penetration rates in the baseline and modeling while simultaneously ignoring the significant challenges and costs associated with doing so. This interpretation runs contrary to the clear prohibition contained in the very same statute that expressly forbids NHTSA from considering EVs when setting fuel economy standards,[268] which applies throughout the standard-setting process and thus expressly applies to NHTSA's consideration of other motor vehicle standards of the Government[269] If this were not clear enough, in statutory interpretation, the specific provision governs over the general one. NHTSA cherry picks when and how it considers other government standards, conveniently doing so when it would support NHTSA's Proposal, but failing to consider the implications of such standards where they would weigh against NHTSA's Proposal. If NHTSA had adequately considered the cumulative impacts of other government standards, as required under EPCA when determining the maximum feasible standard, then it would become clear that significant additional lead time is needed to meet these proposed standards.

[267] 49 U.S.C. 32902(f).
[268] 49 U.S.C. 32902(h) ("In carrying out subsections (c), ***(f)***, and (g) of this section, the Secretary of Transportation— (1) may not consider the fuel economy of dedicated automobiles." (emphasis added)).
[269] *See* Final Reply Br. of Pet'r American Fuel & Petrochemical Manufacturers and State Petitioners, Doc. #2000037, *Nat. Res. Def. Council v. EPA*, No. 22-1080 (D.C. Cir.), pp. 6-9.

#### a) NHTSA improperly considered CARB's ZEV regulations and EPA's existing GHG standards.

Despite a clear congressional directive that NHTSA "shall not" consider the fuel economy of EVs when determining the maximum feasible fuel economy standards, NHTSA openly acknowledges that it did exactly what it is forbidden to do. For example, in describing how it considered other government standards, NHTSA states that it "considered EPA's standards for this proposal by including the baseline (i.e., the MYs 2024-2026) GHG standards in [the] analytical baseline for the main analysis.[270] Similarly, NHTSA included "anticipated manufacturer compliance with California's ZEV mandate (and its adoption by the Section 177 states)" by incorporating the corresponding ZEV penetration rates into the baseline and modeling for the Proposed Rule. Figure 20 below demonstrates the magnitude of this assumption. As described in more detail in Section III.A, NHTSA's consideration of EVs in this manner is contrary to its statutory authority and Congressional intent. NHTSA should not rely on regulatory programs that have not received final approval, as California's ACC II program has not yet received a Clean Air Act waiver from EPA. Moreover, as described in more detail above, CARB's ACC I, ACC II, and ACT programs are preempted and are subject to significant ongoing legal challenges and could be invalidated by courts. Relying on preliminary and legally-tenuous programs makes NHTSA's own Proposed Rule significantly vulnerable to legal challenges, particularly in the event that the underlying programs on which NHTSA's standards are premised are deemed invalid.

**Figure 20: Impact of Eliminating ACC II Regulations NHTSA's Baseline Fleet Fuel Economy 2027 to 2032**




Even worse, while assuming that manufacturers will achieve ZEV penetration rates that are not grounded in reality, NHTSA fails to adequately incorporate the significant challenges facing the industry with achieving those rates. As described throughout this document, these challenges include material supply limitations, manufacturing and supply-chain constraints, grid availability and reliability, insufficient charging infrastructure, and significantly lagging consumer demand, which make it highly unlikely that automakers will meet these assumed penetration

[270] 88 Fed. Reg. 56,315.

rates. As a threshold matter, NHTSA should not consider the fuel economy of EVs when determining fuel economy standards. However, if NHTSA chooses to ignore its clear statutory boundaries, it must at least consider the true costs and challenges associated with those assumptions.

#### 4. The proposed standards do not appropriately address the need to conserve energy.

NHTSA is also required to consider "the need of the United States to conserve energy" in its standard setting process.[271] This includes, among other considerations, the cost to consumers and the environment as well as national security and foreign policy considerations.[272] NHTSA consistently underestimates or wholly fails to account for these costs in its Proposal.

##### a) NHTSA underestimates the energy consumption of EVs and overestimates the energy consumption of ICEVs.

NHTSA's Proposal unreasonably relies on comparing ICEV's and ZEV's performance based on vastly different fuel economy testing procedures for these two different technologies and incorrectly assumes it is an apples-to-apples comparison. This error significantly undermines NHTSA's estimates of potential environmental and energy conservation benefits. NHTSA has cherry-picked the data underlying its analysis to boost the estimated energy conservation benefits from EVs compared to ICEVs by a significant percentage. In particular, NHTSA (via EPA's testing procedures for determining fuel economy) assesses ICEV fuel economy differently than ZEVs. Specifically, EPA uses performance data estimates of ICEV fuel economy using EPA's '5-cycle method', i.e., Federal Test Procedure-75 ("FTP") at regular and cold temperatures, Highway Fuel Economy Test (HWFET) and High-Speed Driving (US06) and Use of Air Conditioning (SC03). In contrast, performance data estimates of ZEV fuel economy (unlike the testing for ICEVs) never account for EVs operating: above a top speed of 60 mph (whereas ICEVs are tested at 80 mph), above an acceleration rate of 3.2 mph/sec (whereas ICEVs are tested at 8.46 mph/sec); in real world temperatures (ZEVs are tested at optimal battery performance temperatures of approximately 75 degrees F, while ICEVs are tested at 20 degrees F and 95 degrees F); with air conditioning and heating (EPA assumes ZEVs never used air conditioning or heating).

These discrepancies are unreasonable and arbitrary. If NHTSA's analysis were based on real-world fuel economy testing of ZEVs, it would show they use vastly higher amounts of electricity to travel the same distance, with a corresponding increase in power sector emissions and ZEV maintenance and battery replacement and associated environmental and energy impacts. NHTSA must account for these differences.

NHTSA must also account for research that shows that EVs are driven substantially less than their ICEV counterparts. Without considering this real-world implication, the Agency arbitrarily overstates potential fuel savings. EVs drive fewer miles than ICEVs. One study suggests that a newer ICEVs accumulate 40% more miles than a comparable EV,[273] and a recent

[271] 49 U.S.C. 32902(f).
[272] See Section II above for a more fulsome discussion of energy security and national security and geopolitical considerations.
[273] iSeeCars, *The Most and Least Driven Electric Cars* (May 22, 2023), https://www.iseecars.com/mostdriven-evs-study.

National Bureau of Economy Research study finds that EVs are being driven less than half the annual miles of the average ICEV, which undermines assumptions that the technology will replace a vast majority of trips currently using gasoline.[274] This single omission could result in the Agency arbitrarily doubling any estimated avoided emissions. Assuming reductions in emissions based on the faulty premise that EVs are driven the same distance as ICEVs distorts the cost-benefit analysis, including total carbon emissions reductions and the fuel savings calculations. Policymakers must have a more complete picture about EVs before costly and irreversible commitments are made to the technology.[275]

Further research shows ZEV-owning consumers tend to buy larger second cars, potentially wiping out substantial fuel efficiency savings (and carbon reductions).[276] According to recent research by professors from Yale, MIT, and the University of California-Davis (UC-Davis), even consumers who have already bought ZEVs are less likely to choose another ZEV as an additional car.[277, 278] The Yale, MIT, and UC-Davis study used long-term data, tracking households over several vehicle replacements, and found that "attribute substitution" is a common phenomenon where households buy an additional vehicle with very different attributes than the first vehicle (the "kept vehicle").[279] For example, a household may choose to prioritize cargo space or the need to be able to travel long distances over fuel economy if it already owns an electric car. Attribute substitution has a large countervailing effect on the fuel economy of the newly purchased vehicle. For example, in the preferred specification, increasing the fuel economy of the kept vehicle by 10% results in a 4.8% decrease in the fuel economy of the purchased vehicle.[280]

The authors observed "significant changes in usage patterns that further reduce the net fuel savings" through increases in mileage for both vehicles that "erodes over 60% of the fuel savings from the fuel economy increase of the kept vehicle on net…."[281] The idea is that because

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[274] Burlig, F., Bushnell, J., Rapson, D., Wolfram, C., "Low Energy: Estimating Electric Vehicle Electricity Use," National Bureau of Economic Research Working Paper 28451, http://www.nber.org/papers/w28451.
[275] Moreover, it is notable that the above-referenced study evaluates EVs in the State of California (where more than 50% of U.S. EVs are located). Because the study does not include any colder climates, where ZEV performance degrades materially during winter months, it likely overestimates the average miles driven per ZEV in the U.S. Other studies that claim to show higher ZEV miles traveled include ZEVs used for commercial business and cannot be considered by EPA as representative of the typical EV.
[276] Archsmith, Gillingham, Knittel & Rapson. (2017). "Attribute Substitution in Household Vehicle Portfolios," NBER Working Paper No. 23856, https://www.nber.org/system/files/working_papers/w23856/w23856.pdf.
[277] *Id.*
[278] *See also*, Strategic Vision, "BEVS: THE CUSTOMER STORY," January 2019, Prepared for U.S. Department of Transportation (finding a repurchase rate of BEVs of 54%, meaning nearly half of BEV purchasers bought a gasoline powered vehicle. A full 31% chose an ICEV without any hybrid component, "which is more than three times more than what they stated they believed they would do." It also found that only 9% of plug-in hybrid owners chose a BEV for their next vehicle.)
[279] Archsmith, Gillingham, Knittel & Rapson. (2017). "Attribute Substitution in Household Vehicle Portfolios," NBER Working Paper No. 23856, https://www.nber.org/system/files/working_papers/w23856/w23856.pdf, at 2, 4-5.
[280] *Id.* at 5.
[281] *Id.* at 5-6; see also Laura Bliss, Why Gas-Efficient Cars Can't Save the Climate: New Research Reveals Unintended Consequences, City Lab (Oct. 5, 2017), available at, https://www.citylab.com/transportation/2017/10/why-gasefficient-cars-cant-save-the-climate/541992/ ("In a new white paper, scientists at Yale University, University of California, Davis, and the Massachusetts Institute of Technology reveal an unintended consequence of tighter fuel standards: When a two-car

these drivers already own a small car, they'll seek out a vehicle with the opposite attributes when it comes time to replace the car. Attribute substitution introduces a new and previously unaccounted for phenomenon that reduces the effectiveness of higher fuel economy standards or ZEV mandates.

#### b) NHTSA overstates the environmental benefits of the Proposed Rule.

NHTSA's cost-benefit analysis is lopsided in favor of the Administration's preferred technology – EVs. In analyzing environmental costs and benefits, NHTSA conveniently overlooks negative environmental consequences of ZEVs, including from fleet turnover, increased power generation required to support these vehicles, increased emissions due to heavier vehicles, development of electric vehicle and battery manufacturing supply chain, life-cycle considerations including battery replacements and disposal, and assumptions regarding vehicles miles traveled (VMT).

##### i. Increased vehicle costs associated with the Proposed Rule will reduce fleet turnover.

NHTSA did not fully consider the impact of the rule on fleet turnover. The higher purchase price of new ZEVs will keep older cars and trucks on the road longer. A further increase above all-time highs in the price of new and used vehicles will further slow vehicle replacement. Additionally, as described above in Section III.B.2.c.iii, NHTSA's Proposal will lead to price increases not only of ZEVs but also of ICEVs via cross-subsidization practices, which force ICEV consumers to bear the additional costs associated with increased ZEV penetration rates. As prices increase, sales and fleet turnover decrease, meaning the Proposal will result in older vehicles that are designed to meet less stringent safety standards, emissions standards, and fuel economy standards than newer ones remaining on the road for longer periods of time. The negative effects of this phenomenon are far-reaching and disadvantages emissions reduction, vehicle safety, and the economy.

New CAFE standards may have the unintended consequence of deterring consumers from purchasing new cars because the standards make cars more expensive.[282] NHTSA accounts for this effect by using "scrappage rate" models that estimate how vehicle prices might affect consumers' decisions to discard an older vehicle and buy a new one.[283] Yet, in Section 4.2 of the TSD where NHTSA addresses vehicle life and scrappage rates, there is no discussion of differences between EVs and other types of vehicles.[284] Specifically, NHTSA neglects to mention the need to potentially replace a costly battery in a ZEV at a mileage long before the assumed

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household goes to replace one of its vehicles, a household that already owns a fuel-efficient car tends to buy a gas hog for its second car. This decision-making erodes more than 60% of the fuel savings that first car should have yielded, they found.").

[282] *See*, e.g., Sanya Carley, et al., A Macroeconomic Study of Federal and State Automotive Regulations, Indiana University School of Public and Environmental Affairs (Mar. 2017) at 71, available at, https://spea.indiana.edu/doc/research/working-groups/auto-report-032017.pdf (estimating that CAFE standards would impose between $1,226 and $2,468 in direct manufacturing costs on new cars and trucks by 2025).

[283] This is also sometimes referred to as "fleet turnover" in the economics literature and regulatory documents.

[284] See Appendix B Trinity Technical Review at 12.

average vehicle life of more than 200,000 miles or extremely high costs for accident repairs. The agency simply assumes BEV lifetimes will be the same as other vehicles, which is not realistic in light of AFPM's prior comments to NHTSA,[285] and automaker comments expressing concerns with EPA's proposed battery durability standards.[286] Failure to adequately consider scrappage rates likely leads to a significant overestimation of the existing standard's benefits with respect to fuel conservation and air pollutant emission reductions, and an underestimation of safety risks and societal costs.

The used car market represents 94% of the U.S. vehicle fleet. In addition to the all-time high prices for both new and used vehicles previously mentioned, it is well established that increased new car prices, in turn, lead to higher used car prices.[287] When both new and used car prices increase, the scrappage rate of used cars decreases and older, less fuel-efficient vehicles stay on the road longer.[288] Jacobsen and van Benthem estimated that increased car prices create a 13% to 16% loss of expected gasoline savings.[289]

Moreover, vehicle reliability has increased over recent decades. Therefore, vehicles are being kept on the road for longer periods of time. Longer vehicle retention delays the impact of gasoline efficiency standards. The car market has shown an increase in average age of the U.S. fleet, which is approaching 12 years.[290] Overall, the average vehicle lifetime has increased by over 29% from 1995 to 2017.[291] The reduced fleet turnover resulting from this Proposal further adds to the uncertainty of the Proposal's net benefits and slows the introduction of safety technologies.

#### ii. Increased roadway emissions due to heavier vehicles.

New ZEVs will increase particulate matter ("PM") emissions through increased tire and road wear. EPA's National Emissions Inventory shows that roadway dust contributes more PM2.5 emissions than the tailpipe. Roadway dust emissions, including particles from tire wear, are correlated with vehicle weight, so increases in fleet average vehicle weight would be expected to increase roadway dust PM2.5 emissions.[292] Converting ICEs to ZEVs would significantly increase the average vehicle weight on U.S. roadways, which in turn would increase highway wear and entrained road dust emissions. Additionally, more limited carrying capacity of HDPUVs could require a greater number of ZEVs to move the same tonnage of cargo, thus increasing the number

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[285] AFPM, Comments to the Environmental Protection Agency, Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles, Proposed Rule, Docket No. EPA-HQ-OAR-2022-0829-0714 at 48-53.
[286] AAI Comments at 195-204.
[287] Jacobsen, M. and van Benthem, A., "Vehicle Scrappage and Gasoline Policy," American Economic Review (2015) Vol. 105, No. 3, 1312-1338 ("Vehicle Scrappage").
[288] Gruenspecht, Howard "Differentiated Regulation: The Case of Auto Emissions Standards", American Economic Review, (1982) Vol. 72(2):328-31.
[289] Jacobsen and van Benthem, "Vehicle Scrappage."
[290] Average Age of Automobiles and Trucks in Operation in the United States | Bureau of Transportation Statistics. (2021). Retrieved 15 October 2021, from https://www.bts.gov/content/average-age-automobiles-and-trucks-operation-united-states.
[291] *Id.*
[292] EPA, "2020 National Emissions Inventory (NEI) Data," *available at* https://www.epa.gov/air-emissionsinventories/2020-national-emissions-inventory-nei-data.

of vehicles needed to haul the same amount of cargo, vehicle miles traveled, and resulting PM emissions.

#### iii. Impact of additional electrical generation needed.

NHTSA's assumed ZEV penetration rates and resulting proposed standards will require significant expansion of the electrical grid and energy sources to power these vehicles. This drastic expansion is likely lead to the degradation of air quality in areas in the direct vicinity of existing or new power plants.[293] As described elsewhere in this comment, if NHTSA is going to consider the environmental impacts of this proposal, it must also evaluate the overall increase in critical minerals demand for electrical grid expansion and how that compounds the stress on critical minerals required to produce the ZEVs themselves.[294] Expansion of electrical grids also requires a large amount of earth minerals and metals. Copper and aluminum, which are both needed for ZEVs, are also the two main materials in wires and cables and higher prices could have a major impact on future grid investments and ZEV costs.[295] The need for expanded grid capabilities simultaneous to expanded ZEV production places a more pressing demand on materials like copper and aluminum thereby increasing extraction and refining efforts throughout the global market. These added electricity and material demands would be directly caused by this rule and will have real environmental costs that must be addressed.

#### iv. Mining sector environmental impacts.

The mining sector will also need to grow significantly to meet the EV penetration assumptions of the Proposed Rule. Mining is an energy- and environmental resource-intensive activity. Critical minerals for electric batteries such as lithium and copper are particularly vulnerable to water stress given their high-water usage.[296] And more than 50 percent of today's lithium and copper production is concentrated in areas with high water stress levels. Several major producing regions such as Australia, China, and Africa are also subject to extreme heat or flooding, which pose greater challenges in ensuring reliable and sustainable supplies. Strong focus on environmental best practices in this sector are needed to safeguard natural lands, biodiversity, and sustainable water use. Similarly, focus on ethical best practices is needed to protect indigenous peoples' rights, and to provide better child labor protections. These challenges call for sustainable and socially responsible producers to lead the industry. The accelerated EV technology penetration rate necessary to meet NHTSA's proposal poses significant challenges for the timely and widespread implementation of best practices to be developed, implemented, and ensure oversight mechanisms are working.[297]

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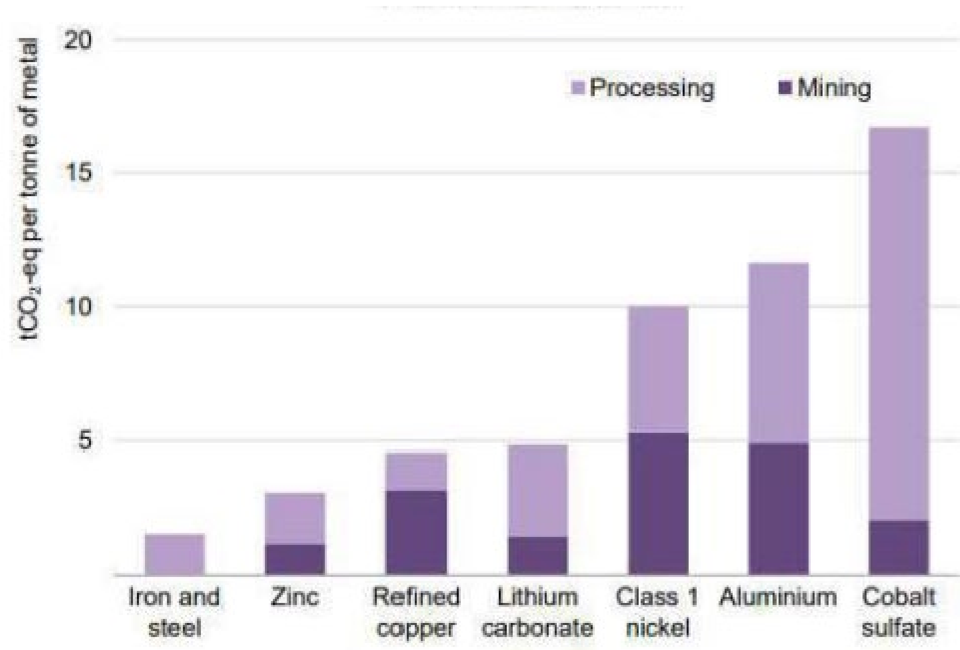
[293] *Id*. at 29,379 (noting that although "[e]missions from upstream sources would likely increase in some cases (e.g., power plants) and decrease in others (e.g., refineries), EPA projects that the Proposed Rule will result in a total decrease in emissions of certain pollutants").
[294] EPCA does not include environmental impacts as a criterion for establishing fuel economy standards, and AFPM reserves the right to challenge any standard set using extra-statutory criteria.
[295] IEA Report 2022.
[296] *See* EIA 2022 Report.
[297] For example, the United Nations Environment Programme is advising the Global Investor Commission on Mining 2030 to identify best practice standards for responsible mining. *See* Mining 2030 at https://mining2030.org/new-global-commission-launched-to-raise-mining-sustainability-standards-by-2030/.

In addition, activities associated with mining produce GHG emissions, particulate matter emissions, nitrogen oxide emissions, and other air pollutant emissions from mining equipment. As shown in Figure 21, mining and processing several minerals and metals used for EV production are carbon intensive.

**Figure 21: Average GHG emissions intensity for production of selected commodities.[298]**




The process for extracting and processing critical minerals can be responsible for approximately 20 percent of the lifecycle GHG emissions from battery production.[299] NHTSA failed to weigh any of these consequences appropriately in the Proposed Rule.

**v. In considering environmental impacts associated with the Proposal, NHTSA should conduct a full life-cycle analysis for EVs to account for their true environmental costs.**

To the extent NHTSA is considering environmental costs and benefits, it must not ignore known consequences of the Proposal, including the emissions caused by the manufacture of batteries, and charging-caused upstream emissions. NHTSA should consider the environmental profiles of both EVs and ICEVs in light of the production, operation, and disposal of the vehicle and its components (its useful life). Such a life-cycle analysis would account for the increased environmental costs associated with the reduced lifespan of these vehicles and their material-intensive components. For example, recycling of the battery and related electrical components of EVs is in a state of infancy and poses unique materials handling and safety challenges. The following list provides just some of the electric battery disposal-related issues that are likely to impact the environment and need to be addressed by NHTSA in the Proposed Rule:

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298 IEA Report 2022 at 17.

299 H.C. Kim, et al., ENVIRONMENTAL SCIENCE AND TECHNOLOGY (Vol. 50) "Cradle-to-Gate Emissions from a Commercial Electric Vehicle Li-Ion Battery: A Comparative Analysis," (2016), pp. 7715-22.

- Battery packs could contribute 250,000 metric tons of waste to landfills for every 1 million retired ZEVs.[300]
- Less than five percent of Li-ion batteries, the most common batteries used in ZEVs, are currently being recycled "due in part to the complex technology of the batteries and cost of such recycling."[301]
- Economies of scale will play a major role in improving the economic viability of recycling, for which currently cost is the main bottleneck. Increasing collection and sorting rates is a critical starting point.[302]
- The cathode is where most of the material value in a Li-ion battery is concentrated. Currently, there are numerous cathode chemistries being deployed. Each of these chemistries needs to be known, and then the appropriate method of recycling identified, which poses a challenge, as batteries pass through a global supply chain and all materials are not well tracked.
- Lithium can be recovered from existing Li-ion recycling practices but is not economical at current lithium prices.
- BMI forecasts that near-term recyclers are likely to use scrap material from the increasing number of gigafactories coming online versus used electric vehicle batteries. Scrap is anticipated to account for 78 percent of recyclable materials in 2025.[303]
- In 2022, BMI expected over 30 gigawatt hours of process scrap to be available for recycling, growing ten-fold across the next decade. Loss rates vary by region and tend to be higher in earlier years of a gigafactory.[304]
- Many 'spent' EV batteries still have 70-80 percent of their capacity left, which is more than enough to be repurposed into other uses such as energy storage and other lower-cycle applications for approximately another 10 years.[305] This will extend the time that batteries and raw materials remain in use and therefore increase the demand for virgin critical minerals.
- Clear guidance on repackaging, certification, standardization, and warranty liability of spent ZEV batteries would be needed to overcome safety and regulatory challenges reuse poses at scale.[306]
- Recycling ZEV batteries to recover high-value metals has not been proven to a commercial scale. The majority of analysts are aligned that recycling will not become an integral supplier of raw materials until the 2030s, and at that point, only will provide approximately 20 percent of demand.[307]

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[300] Kelleher Environmental, "Research Study on Reuse and Recycling of Batteries Employed in Electric Vehicles: The Technical, Environmental, Economic, Energy and Cost Implications of Reusing and Recycling EV Batteries", (September 2019) *available at* https://www.api.org/oil-and-natural-qas/wellstoconsumer/fuels-and-refininq/fuels/vehicle-technoloqy-studies.
[301] Gavin Harper, Roberto Sommerville, et al., NATURE, "Recycling lithium-ion batteries from electric vehicles" (Jan. 21, 2020) *available at* https://www.nature.com/articles/s41586-019-1682-5.
[302] IEA Report 2022.
[303] Benchmark Minerals Intelligence, "Battery production scrap to be main source of recyclable material this decade" (Sept. 5, 2022) available at https://source.benchmarkminerals.com/article/battery-productionscrap-to-be-main-source-of-recyclable-material-this-decade.
[304] *Id*.
[305] Pagliaro, M. and Meneguzzo, F., "Review Article: Lithium battery reusing and recycling: A circular economy insight," *Heilyon* 5: E01866 (June 15, 2019) *available at* https://doi.org/10.1016/j.heliyon.2019.e01866.
[306] IEA Report 2022.
[307] Benchmark Minerals Intelligence, *supra* at n. 105.

- Unlike ICEVs, EPA has recently stated that ZEV batteries may need to be handled as hazardous waste, further driving up the cost of such recycling efforts.[308]
- Whether sufficient recycling capacity can be permitted and constructed to facilitate the Proposal.

NHTSA must, therefore, conduct a full life-cycle analysis to compare all environmental impacts to reasonably conclude that the Proposal will decrease environmental impacts.

Finally, NHTSA's unrealistic assumptions regarding EV efficiency and cost result in overstated environmental benefits and understated costs. According to NHTSA, the physical and environmental impacts are the result of either fuel consumption and VMT, with the product of on-road fuel economy (or fuel efficiency) and VMT determining fuel consumption of each vehicle.[309] Yet, as Trinity Consultants points out, in Section 4.3 of the TSD, NHTSA baselessly concludes EVs will be driven more than other types of vehicles.[310] There is no debate that EVs have a more limited range, need charging infrastructure, and cost more than ICEVs and hybrid vehicles. But Section 4.3 of the TSD makes no mention of EVs' limited range or the need for recharging when discussing how the VMT input was derived. Instead, after ignoring the impacts of limited range and charging infrastructure, NHTSA assumes without any evidence that lower operating costs will result in EVs being driven more than other types of vehicles. There is simply no basis for the conclusion that EV VMT will increase, thereby resulting in fewer emissions. In fact, the data shows that individuals drive EVs fewer miles than their ICEV counterparts (see Section III.B.4.b.v above). This information was previously presented to NHTSA and is well known. NHTSA is acting arbitrarily and capriciously in continuing to rely on this known inaccuracy.

## IV. THE PROPOSED RULE VIOLATES NHTSA'S STATUTORY AUTHORITY BY FAILING TO ESTABLISH MAXIMUM CRITICAL AVERAGE FUEL ECONOMY STANDARDS FOR HEAVY DUTY PICKUP TRUCKS AND VANS (HDPUVS)

Similar to the determination for passenger cars and light trucks, for commercial medium-duty and heavy-duty vehicles and work trucks, including HDPUVs, NHTSA must set "maximum feasible" fuel economy standards that are "appropriate, cost-effective, and technologically feasible."[311] While these factors have previously been treated broadly and not well-interpreted, NHTSA's proposed standards fail to meet this requirement. Under NHTSA's Proposal (the "HDPUV10" Alternative), fuel efficiency stringency would increase, on average, 10 percent per year, year over year, for MY 2030–2035 HDPUVs. NHTSA has done little to evaluate that such stringency increase is "appropriate, cost-effective, and technologically feasible" for the commercial HDPUV fleet and in fact has abrogated its responsibility to do so by assuming, erroneously, that the majority of the HDPUV fleet would have largely become compliant by 2030 under the "No Action" alternative. In other words, NHTSA has declined to comprehensively evaluate the appropriateness, cost-effectiveness and technological feasibility of its Proposed Rule.

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[308] Letter from Carolyn Hoskinson, Director, EPA Office of Resource Conservation and Recovery, "Lithium Battery Recycling Regulatory Status and Frequently Asked Questions," (May 24, 2023).
[309] PRIA at 4-4
[310] See Appendix B Trinity Technical Review at 12.
[311] 49 U.S.C. § 32902(k)(2).

NHTSA failed to address any of the unique statutory factors for HDPUVS. For example, Section 3902(k)(1) directs NHTSA to rely on a National Academy of Sciences Study and consult with DOE and EPA to "examine the fuel efficiency of commercial medium and heavy-duty on highway vehicles and work trucks." and determine: (1) "the appropriate test procedures and methodologies for measuring the fuel efficiency of such vehicles and work trucks," (2) the appropriate way to measure the "fuel efficiency performance" of those vehicles, (3) the range of factors that affect their "fuel efficiency," (e.g., design, functionality, use, duty cycle, infrastructure, total overall energy consumption, operating costs) and (4) "other factors and conditions that could have an impact on a program to improve" their "fuel efficiency."[312] With that determination, NHTSA was to consult with DOE and EPA to "determine in a rulemaking proceeding how to implement a commercial medium- and heavy-duty on-highway vehicle and work truck fuel efficiency improvement program designed to achieve the maximum feasible improvement."[313]

Nor has NHTSA adequately explained its authority to include BEVs in its HDPUV standards. Section 32902(k) directs NHTSA to determine how to implement a "fuel efficiency improvement program" for commercial medium and heavy-duty vehicles that would achieve the "maximum feasible improvement" that is "appropriate", "cost-effective", and "technologically feasible" for this category of vehicles. Such an improvement program is necessarily less prescriptive than the passenger vehicles and light trucks standards, and it would make no sense for Congress to have excluded BEV's from its more prescriptive standard setting directive for passenger vehicles and light trucks and include them in an "improvement program." Moreover, it is unclear how forcing increased electrification of HDPUVs would improve the fuel economy of any ICE HDPUVs, as it is just a displacement. That has no basis in the statute, and to the extent there is any question, the authority to require displacement of ICE vehicles presents a major question of vast economic and political significance that would require a clear statement from Congress (which is not present).

### A. Appropriateness

As described in the Proposed Rule, NHTSA suggests that the "appropriate" factor is the "kitchen sink" of HDPUV standard setting and interprets it broadly to include, among other things, energy conservation, fuel savings, and energy security, environmental benefits and emissions avoided, possible safety effects, effects on the industry that do not directly relate to cost effectiveness including on sales and employment, as well as effects in the industry that may be happening for reasons unrelated to NHTSA.[314]

NHTSA's projections of a rapid transition to electric vehicles warrants an evaluation of whether it is appropriate to measure ICE and BEV with the same measuring stick. EVs and ICEVs both generate emissions of CO2 and other pollutants. NHTSA places a significantly greater regulatory burden on ICEVs. NHTSA should have considered whether separate emissions standards for ICEs and BEVs are appropriate. HDPUVS fuel efficiency does not have a PEF factor that sets equivalency from EVs and ICEs as with passenger vehicles. And Congress could not have anticipated when electric vehicles would become competitive in the marketplace when

[312] 49 U.S.C. § 32902(k)(1).
[313] 49 U.S.C. § 32902(k)(2).
[314] "NHTSA interprets 'appropriate' broadly, as not prohibiting consideration of any relevant elements that are not already considered under one of the other factors." 88 Fed. Reg. at 56,320.

it tasked NHTSA with setting fuel efficiency standards, which therefore were clearly intended to address vehicles operating with liquid fuels.

All of the same concerns about NHTSA's Proposal for passenger cars and light trucks, including that the proposal exceeds NHTSA's statutory authority and raise major questions of economic and political significance that would require a clear statement from Congress, the proposed standards are not being feasible and security concerns related to relying on electrification, as described above in Sections II and III.B, are relevant in the HDPUV context and are incorporated here by reference.

**1. National security and energy security considerations are largely ignored**

The comments above in Sections II and III regarding national and energy security considerations are applicable in the HDPUV context as well and are incorporated here by reference. In particular, NHTSA largely ignores important considerations, including the scarcity of critical minerals required to produce ZEV batteries as described above in Section III.B.1.a and insufficient grid and charging infrastructure as described in Sections III.B.1.b-c. In fact, the scarcity of critical minerals and electric charging infrastructure is much more impactful in the HDPUV context since, as NHTSA acknowledges, there are so few HDPUV manufacturers and the market is much smaller than passenger cars and light trucks and much less diverse. "The nature of this fleet—smaller, with fewer models—and the nature of the technologies that this fleet will be applying leading up to and during the rulemaking time frame, means that the analysis is very sensitive to changes in inputs, and the inputs are admittedly uncertain."[315] Forcing a substantial portion of the commercial HDPUV fleet to electrify with an implicit ZEV mandate, will make the fleet reliant on these scare minerals and beholden to the unstable countries that control them, thereby further reducing our energy security and impacting the stability of our commercial fleet operations using HDPUV class vehicles.

**2. The Proposal over-estimates the amount of energy conservation for HDPUV EVs**

The comments above in Section III.B.4 regarding NHTSA's estimates of energy conservation are applicable in the HDPUV context as well and are incorporated here by reference. As described above in Section III.B.4.a, NHTSA consistently underestimates the energy consumption of EVs and overestimates the energy consumption of ICEVs, and therefore erroneously considers ZEVs as conserving greater energy than ICEVs. In reality, ZEVs use significant amounts of electricity and result in a corresponding increase in power sector emissions. ZEV maintenance and battery replacement, as well as potentially shorter useful lives, also have associated environmental impacts. NHTSA must account for these differences and environmental impacts. Until the agency fully accounts for the true energy consumption and environmental impacts of ZEVs, NHTSA cannot support its "appropriate" determination of its proposed standards.

[315] 88 Fed. Reg. at 56,358.

### 3. The environmental benefits of HDPUV EVs are over-estimated and HDPUV ICEVs are under-estimated

The comments above in Section III.B.4 regarding NHTSA's estimates of environmental benefits of EVs (and impacts of ICEVs) are applicable in the HDPUV context and are incorporated here by reference.

In particular, to support a viable HDPUV ZEV fleet, significant upgrades and expansion of energy and charging infrastructure will be necessary. NHTSA ignores the significant environmental impacts associated with such expansion, including the impact of additional electrical generation and mining as described in Sections III.B.4.b.iii-iv. As noted above in Section III.B.4.b.ii, ZEVs are typically heavier than their ICEV counterparts, thereby resulting in increased PM emissions through increased tire and road wear. This is particularly true in the HDPUV context.

Additionally, NHTSA ignores the fact that due to higher purchase and lifetime costs associated with HDPUV ZEVs, many commercial fleet operators may choose to either keep their older vehicles on the road longer (thereby reducing fleet turnover) or purchase a larger vehicle that is not subject to the proposed HDPUV standards (resulting in greater emissions from a larger vehicle than would have otherwise been purchased in the absence of the proposed standards).

Finally, similar to the discussion in Section III.B.4.b.v above, in order to fully account for the true environmental impacts of its Proposal, NHTSA should conduct a full life-cycle analysis for HDPUV ZEVs, which would account for cradle-to-grave considerations associated with ZEVs (including significant concerns related to disposal of batteries as hazardous waste, among others).

### 4. Important regulatory effects to consumers and commercial operators, including on employment, are ignored

Equally importantly, in considering whether its proposed HDPUV standards are "appropriate," NHTSA must consider the significant costs to commercial fleet operators associated with purchasing, using and maintaining HDPUV ZEVs. For example, as described above in Sections III.B.2.b-c, HDPUV ZEV owners will be faced not only with higher costs to purchase these vehicles, but also to maintain them. While conventional ICEV HDPUVs can be refueled in a matter of minutes, HDPUV ZEVS will require significant time to accommodate charging needs, which results in costly vehicle down-time and increased labor expenses. As described above in Section III.B.1.c, the electrical grid and charging infrastructure would need to be significantly upgraded and expanded to support HDPUV ZEV commercial fleets. Dual charging installations to enable the flexibility of passenger car, light truck, and HDPUV charging will become increasingly important, and direct current fast charging equipment ("DCFCs") will enable broader market coverage. However, the same supply, timeline, and cost constraints described above in Sections III.B.1.d and III.B.2.e also apply to HDPUV ZEVs. All of these impacts will inevitably increase the cost of new, electrified HDPUVs for consumers and commercial fleet operators and reduce consumer operator demand for HDPUV ZEVs. Consequently, commercial operators may choose not to purchase or operate as many vehicles, which could reduce the number of employees and drivers across the commercial fleet. NHTSA appears to have declined to review such possibility or even consider potential impacts on commercial operator businesses and employees.

### B. Cost-Effectiveness

As NHTSA acknowledges, "Congress' use of the term 'cost-effective' in 32902(k) appears to have a more specific aim than the broader term ''economic practicability'' in 32902(f)."[316] NHTSA interprets this factor as a cost/benefit balancing, and has previously considered the ratio of estimated technology (or regulatory costs) to estimated value of GHGs emissions avoided and estimated fuel savings or the consumer costs and benefits.

For all the reasons described above in Section III.B.2 and III.B.4, incorporated here by reference, NHTSA has overestimated the value of GHG emissions avoided and estimated fuel savings for ZEVs, in particular for HDPUVs.[317] Moreover, NHTSA also has woefully underestimated the regulatory costs of HDPUV electrification. Amazingly, NHTSA has assumed the vast majority of regulatory costs for HDPUV manufacturers will occur in the No Action alternative—in large part as a result of compliance with EPA requirements—and has failed to assess any significant costs in connection with NHTSA's own proposed standard alternatives.[318] Accordingly, NHTSA's cost-effective determination is skewed and unreliable.

### C. Technical Feasibility

NHTSA interprets technological feasibility in the HDPUV context similar to the passenger car and light truck context. Importantly, in the HDPUV context NHTSA stresses "that a technology does not necessarily need to be currently available or already in use for all regulated parties to be 'technologically feasible'" under the statute.[319] NHTSA stresses this point because it is keenly aware that even though ZEV technology is available, large-scale deployment for HDPUVs is questionable and speculative at best. Currently ZEV HDPUV production is miniscule and unlikely to reach the necessary scale in the timeframe proposed, in particular given the significant costs and trade-offs associated with ZEV technology in HDPUVs.

Yet, in the Proposed Rule NHTSA assumes significant increases in electrification, including BEV, SHEV, and PHEV HDPUVs by MY 2038,[320] despite acknowledging that zero PHEV HDPUVs currently exist or are planned,[321] that only 6 percent of the HDPUV baseline fleet was projected to be BEV, and that no other electrification technologies were present in the baseline fleet.[322] Moreover, NHTSA assumes this leap to scale of electrified HDPUVs mostly as

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[316] 88 Fed. Reg. at 56,320.
[317] "NHTSA regulations currently grant BEVs (and the electric-only operation of PHEVs) an HDPUV compliance value of 0 gallons/100 miles" 88 Fed. Reg. at 56,283.
[318] 88 Fed. Reg. at 56,283-84.
[319] 88 Fed. Reg. at 56,320-21.
[320] 88 Fed. Reg. at 56,283.
[321] Draft TSD at 3-75. "There are no PHEVs in the baseline HDPUV fleet and there are no announcements from major manufacturers that indicate this a pathway that they will pursue in the short term." NHTSA believes "this is in part because PHEVs, which are essentially two separate powertrains combined, can decrease HDPUV capability by increasing the curb weight of the vehicle and reducing cargo capacity. A manufacturer's ability to use PHEVs in the HDPUV segment is highly dependent on the load requirements and the duty cycle of the vehicle." *Id*.
[322] Draft TSD at 3-75-3-79.

part of its No Action alternative, thereby minimizing the costs and impacts analyzed for the imposition of NHTSA's proposed HDPUV standards.

NHTSA's assumptions regarding the feasibility and projected availability of HDPUV ZEVs are not sufficiently supported—and, frankly, are *unsupportable*. Among other things, NHTSA's Proposal and CAFE Model do not distinguish between the less costly lower range BEV1 and BEV2 options, and the much more costly and virtually unavailable higher range BEV3 and BEV4 options. This is based on an assumption that that "BEV HDPUVs are often used as delivery fleet vehicles or utility/service vehicles, and require less range capability compared to light-duty vehicles."[323] To support this assumption, NHTSA relies on press articles quoting dealer opinions, along with a review of less than 100 delivery vehicles conducted by the National Renewable Energy Laboratory from 2014.[324] This is tragically insufficient. Since the COVID pandemic and corresponding shutdowns, delivery services and consumer expectations have undergone a complete transformation and delivery fleets have experienced significant and unprecedented increases in demand. NHTSA should coordinate with others within the Department of Transportation as well as the commercial fleet operators to fully analyze—rather than assume or guess—the range needs for HDPUV commercial delivery and service/utility vehicles, and then NHTSA should adjust its modeling to fully assess the real feasibility (and cost) of the BEVs that commercial HDPUV fleet operators really need.

In addition, NHTSA's assessment largely ignores important considerations, including the scarcity of critical minerals required to produce batteries as described above in Section III.B.1.a, insufficient grid and charging infrastructure as described in Sections III.B.1.b-c, insufficient time to facilitate such a drastic fleet transition and infrastructure expansion as described in Section III.B.1.d, and unrealistic assumptions regarding consumer adoption rates as described in Section III.B.1.e, which also apply for HDPUVs and are incorporated here by reference.

## V. THE DRAFT ENVIRONMENTAL IMPACT STATEMENT IS INADEQUATE

As detailed in our comments on the Draft Environmental Impact Statement (see Appendix C AFPM Comment on NHTSA's Draft Environmental Impact Statement (AFPM DEIS Comment)) and incorporated herein by reference, NHTSA's alternatives are inadequate. First, all CAFE alternatives for the light duty vehicle fleet and alternatives reflecting the combined impact of proposed standards for CAFE and HDPUV include BEVs in violation of EPCA. Specifically, two passenger car and light tuck alternatives (PC3LT5 and PC6LT8) and one heavy duty alternative (HDPUV14) are so infeasible that NHTSA could not adopt them. Moreover, as articulated in Section III.B.2.f above, NHTSA's Proposal implicates the major questions doctrine and, therefore, NHTSA lacks the authority to adopt the proposed standard. Finally, NHTSA's alternatives do not address reasonably available, cost-effective mitigation measures reflecting the use of improved technologies for internal combustion engine vehicles and liquid fuels.

The DEIS also understates the environmental consequences of the proposed standards, most notably because it does not conduct a full life cycle assessment of mandating EVs. In a rule that compares the relative GHG emissions of two distinct technologies that can be used to

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[323] Draft TSD at 3-77.

[324] Id. (citing National Renewable Energy Laboratory. NREL Fleet DNA: Commercial Fleet Vehicle Operating Data (Fleet DNA Project Data Summary Report prepared by K. Walkowicz et al. (Aug. 1, 2014), available at: https://www.nrel.gov/transportation/fleettest-fleet-dna.html).

meet an average standard, the agency must fairly characterize the emissions resulting from each technology option. In the context of this rulemaking, where ICEVs emit most of their carbon from the tailpipe and EVs emit them mostly during the vehicle production and recharging phases, lifecycle analyses of each technology are critically important and the only way of ensuring an apples-to-apples comparison. For individual project permitting, such as for pipelines, these projects are unlikely to cause any foreseeable upstream impacts because the products they transport exist in a global market and would likely reach the market anyway; but here, where you have a forced transition of an *entire industry*, and a rulemaking that creates new demand for critical minerals, the upstream impacts are well known. Ignoring GHG emissions from battery production and replacement, vehicle charging operations, and a grid buildout, necessitated by this rulemaking would be arbitrary and capricious and contrary to NEPA.

NHTSA's analyses of the ability of the proposed CAFE standard to conserve energy, air quality impacts, and direct and indirect impacts on climate change and GHG emissions are based on faulty assumptions. Additionally, NHTSA must conduct a systemic, interdisciplinary evaluation of the economic (*e.g.*, impact on jobs and worker wages), safety considerations, and the proposed standard's impact on fleet turnover and quality. Finally, the DEIS is devoid of any discussion regarding the conflict between these proposed standards and Congressional objectives as expressed in the Energy Independence and Security Act and the Renewable Fuel Standard. For these reasons and the numerous deficiencies identified in AFPM's comments, NHTSA should withdraw its proposed standards.

## VI. THE PROPOSAL FAILS TO PROVIDE MEANINGFUL OPPORTUNITY FOR PUBLIC COMMENT

AFPM welcomes the opportunity to meaningfully engage with regulators to discuss cost-effective, efficient, and feasible measures to improve the fuel efficiency of the transportation sector. Unfortunately, the comment period for this rule (which runs concurrently with the comment period on the accompanying DEIS) is insufficient to provide fully informed comments on the Proposal.

Although AFPM was one of several entities requesting that NHTSA extend the comment period, the agency declined, claiming in part that its pre-publication release of material meant that the public in fact had 19 additional days to comment on the Proposed Rule.[325] This ignores the fact that not all supporting material was available the same day as the pre-publication copy, as well as the sheer volume of material NHTSA released. In addition to the Proposed Rule itself, the rulemaking docket comprises a significant quantity of additional material subject to review and comment, including various modeling scenarios and technical analyses. In total, commenters are expected to review and comment on over 5,000 pages of technically complex materials that affect many industries and segments of the economy beyond auto manufacturing. In addition, NHTSA released a technical correction twelve days after the NPRM publication,[326] a fact also overlooked by the denial of extension.

[325] Letter from R. Ryan Posten, Associate Administrator for Rulemaking, U.S. Department of Transportation National Highway Traffic Safety Administration, received September 29, 2023.
[326] NHTSA, Notice of proposed rulemaking correction, 88 Fed. Reg. 58,229 (Aug. 25, 2023).

NHTSA's refusal to grant additional time to respond to the NPRM denied the public ample time to formulate meaningful comments responsive to the underlying information in support of the Agency's Proposal. The Agency's action is an arbitrary departure from its typical practice of granting reasonable extensions of time—often thirty days, but frequently sixty or even ninety—to provide meaningful input from the public on proposed rules.

The Administrative Procedure Act requires opportunity for meaningful public input, and Executive Order 12866 states that, in most cases, agencies should provide a comment period "of not less than 60 days." In other words, a 60-day comment period is the minimum expected. Even counting the handful of additional days afforded by NHTSA's pre-publication release of the preamble, this period is not sufficient to adequately address the sweeping scope of NHTSA's Proposal, particularly coming on the heels of multiple other sweeping federal and state proposals that would interact in complicated ways to completely transform the U.S. transportation industry.[327] Considerable time is required simply to read and respond to the sheer volume of material covered in the rulemaking docket, let alone to analyze the impacts of the Proposed Rule within the context of other recent federal and state proposals. Moreover, as illustrated in these comments, our review identified numerous instances in which NHTSA's analysis is inaccurate, incomplete, or misleading. Thus, to meaningfully respond to NHTSA's Proposal, the public must fact-check NHTSA's work.

Further, the short comment period is exacerbated by NHTSA's unduly narrow identification of industries affected by this rule. Under the heading "Does this action apply to me," NHTSA limits its identification of affected industries to entities with direct compliance obligations: motor vehicle manufacturers, commercial importers of vehicles and vehicle components, and alternative fuel vehicle convertors.[328] Although NHTSA notes that "[t]his list is not intended to be exhaustive," NHTSA understands many entities necessarily rely on regulatory screening tools based on search terms tied to their own NAICS codes to alert them to new proposed rules that may impact them. Moreover, NHTSA is well-aware, given other current contexts outside the agency, that fuel producers and manufacturers, including AFPM members, are interested and affected stakeholders.

By narrowly limiting the identification of industries affected based on this extremely short and incomplete list of NAICS codes and by its arbitrary refusal to extend the comment periods, NHTSA has unreasonably constrained the number and types of entities that will find out about these proposed actions in time to comment. This is at odds with NHTSA's responsibility under the Administrative Procedures Act and the Due Process clause of the U.S. Constitution.

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[327] *See e.g.,* Environmental Protection Agency, Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles, Proposed Rule, 88 Fed. Reg. 29,184 (May 5, 2023); Department of Energy, Petroleum-Equivalent Fuel Economy Calculation, Notice of Proposed Rulemaking; Request for Comment, 88 Fed. Reg. 21,525 (April 11, 2023); Environmental Protection Agency, Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles—Phase 3, Notice of Proposed Rulemaking, 88 Fed. Reg. 25,926 (April 27, 2023); and California Air Resources Board, Advanced Clean Cars (ACC) II standards (see rulemaking documents at https://ww2.arb.ca.gov/rulemaking/2022/advanced-clean-cars-ii) and corresponding section 177 state adoption proposals.

[328] 88 Fed. Reg at 56,131.

## VII. CONCLUSION

Rather than secure our nation's energy and national security, NHTSA departed from Congressional intent by proposing standards that do not meet statutory requirements. NHTSA exceeded its legal authority by setting the fuel economy standards at a level that is not feasibly achievable by ICEVs, effectively establishing a de facto EV mandate. Despite EPCA's explicit instruction, NHTSA improperly considered EVs when setting CAFE standards for passenger cars and light-duty trucks. NHTSA failed to set "maximum feasible" fuel economy standards that ICEVs can achieve based on the four statutory factors, Similarly, the proposed fuel efficiency standards for commercial medium-duty and heavy-duty vehicles and work trucks, including HDPUVs are not (i) appropriate, (ii) cost-effective, and (iii) technologically feasible. For these reasons, NHTSA should withdraw the Proposed Rule.

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