American
Fuel & Petrochemical
Manufacturers

1800 M Street, NW
Suite 900 North
Washington, DC
20036

202.457.0480 office
202.457.0486 fax
afpm.org

July 5, 2023

Administrator Michael Regan
Environmental Protection Agency
EPA Docket Center, OAR Docket
Mail Code 28221T
1200 Pennsylvania Avenue NW
Washington, DC 20460

Attention: Docket ID No EPA-HQ-OAR-2022-0829
Submitted to the Federal eRulemaking Portal (www.regulations.gov)

Re: EPA-HQ-OAR-2022-0829, Notice of Proposed Rulemaking: Multi-Pollutant Emissions Standards for Model Year 2027 and Later Light-Duty and Medium-Duty Vehicles

Dear Administrator Regan,

On May 5, 2023, the U.S. Environmental Protection Agency ("EPA" or "Agency") proposed multi-pollutant emissions standards for model years ("MY") 2027 and later for light-duty and medium-duty vehicles (the "Proposed Rule" or "Proposal").[1] "Despite the significant emissions reductions achieved by [previous] rulemakings,"[2] EPA is revisiting the existing regulatory regime to mandate unrealistic emissions standards that are only achievable through an exponential growth in sales of zero-emission vehicles ("ZEVs"). The American Fuel & Petrochemical Manufacturers ("AFPM") supports improving motor vehicle efficiency and reducing transportation-related emissions, but we cannot support EPA's unlawful attempt to ban internal combustion engine vehicles ("ICEV") and limit consumer choice. Disturbingly, the Proposal provides little to no discernable regard for alternative technologies, consumer preferences, feasibility, cost, the impact on U.S. energy and national security interests, or the very real environmental trade-offs associated with an effective ban on new ICEVs nor does the Proposed Rule encourage informed input from the public, as evidenced by the arbitrary 60-day comment period spanning two federal holidays for a rule more than 250 pages in length supported by a 280-page Draft Regulatory Impact Analysis ("DRIA").

EPA's Proposed Rule fails to take a comprehensive view of all available technologies and their associated environmental impacts. The proposal conspicuously omits any discussion of technology to reduce the carbon intensity of liquid fuels, and in fact does not even use the words "biofuels" or "renewable fuels" a single time. Instead, the Proposal forces automotive electrification in a manner that both exceeds EPA's statutory authority and employs arbitrary and capricious decision-making. There are better, lawful ways to reduce transportation-related emissions that do not ban entire vehicle powertrains or sacrifice our hard-earned energy independence.

AFPM represents the U.S. refining, petrochemical, and midstream industries. In addition to actively pursuing emissions reductions from their operations, our members are increasingly

[1] 88 Fed. Reg. 29,184 (May 5, 2023).
[2] *Id.* at 29,186.

investing in renewable fuels such as ethanol, renewable gasoline, renewable diesel, and sustainable aviation fuel. We are committed to sustainably manufacturing and 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 EPA insufficiently considers. AFPM does not oppose expanding consumer choice to include electric vehicles ("EVs") as part of a diverse transportation future that will require more energy to sustain a growing global population. What we oppose is limiting consumer choice. The Proposed Rule does so by abandoning technology-neutral standards and intentionally setting tailpipe emissions standards unachievable by well-controlled ICEVs. Consequently, the only choice for consumers in the future will be government-mandated ZEVs. ZEVs are not the only means to reduce carbon and criteria pollutant emissions from the transportation sector, particularly when consumer costs are considered. A cost-effective, technology-neutral approach, built upon a full lifecycle analysis (LCA), would achieve better outcomes for consumers, U.S. energy and national security, and the environment.

EPA's regulatory cost-benefit analysis is grossly deficient, having overstated the environmental benefits by ignoring emissions that this rule will cause and understating known costs where those factors undermined the pre-determined outcome of mandatory electrification. EPA's biased analysis is pervasive throughout the proposal, rising to the level of arbitrary and capricious rulemaking. We discuss this deficiency in greater detail in Section IV, infra.

EXECUTIVE SUMMARY

EPA proposed unachievable standards for light- and medium-duty ICEVs. This attempt to force an unprecedented transformation of the national transportation system to ZEVs goes far beyond the authority delegated to the Agency by Congress. The Proposal—which will likely require hundreds of billions of dollars, dictate what vehicles are permissible for automakers to sell, and has significant ramifications for the U.S. energy sector, national security, and consumers—clearly addresses questions of major economic and political significance that EPA is neither authorized nor equipped to address.

EPA also misinterprets its authority to establish feasible efficiency improvements by proposing standards that cannot be achieved with ICEV technologies. First, EPA is not permitted to rely on averaging, banking, and trading mechanisms as a means to establish the relevant standards. Second, because ZEVs do not have tailpipe emissions, they do not directly "cause or contribute to" air pollution within the construct of a tailpipe emissions standard, and therefore any standard applicable to "any class or classes" of vehicles "which . . . cause, or contribute" to air pollution cannot include ZEVs.

Even if EPA had Congressional authority to promulgate the proposed standards, the proposal is arbitrary and capricious due to the Agency's reliance on incomplete facts, overly optimistic or outright mistaken assumptions, and failure to use reason-based decision-making. The Agency significantly overestimates environmental benefits and feasibility, underestimates costs, and relies on little more than unsupported hope that consumer preferences will change to enable the Agency's intended policy. EPA's decision to not only ignore lifecycle emissions of ZEVs, but to explicitly propose removing the requirement for automakers to account for them, serves neither consumers nor the environment. EPA's reasoning, that its policy of not accounting for these emissions serves its goal of promoting the use of EVs, is the definition of arbitrary and capricious biased decision-making. Unfortunately, the Agency also ignored significant issues related to energy security and U.S. national security.

The Proposed Rule requires increased 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 and refined product exports.

There is significant doubt that the U.S. electric grid can reliably support the proposal. Demand for electric vehicle charging will place significant stress on generation, transmission, distribution, and consumer charging systems, that are unlikely to meet increased demand in such a short timeframe. EPA should better assess grid impacts from a regional basis, particularly in the Southwest where the grid is already under significant stress.

The purported benefits in terms of reductions in cost, greenhouse gas emissions, and environmental impacts are based on flawed analyses and will not be realized by consumers. EPA's tailpipe-only approach is flawed, and the Agency needs to evaluate light- and medium-duty vehicles on a full lifecycle basis, regardless of whether those emissions result from electricity generation, battery production, or the combustion of liquid or gaseous fuels. Consumer benefits from the proposal are exaggerated by assuming an unrealistic baseline rate of ZEV-adoption, and inadequate assessments of ZEV purchase and ownership costs, charging costs, and road infrastructure costs.

EPA also failed to provide a meaningful opportunity for public comment by limiting the comment period to 60 days, denying requests form AFPM and other stakeholders to extend the comment period, and concurrently proposing heavy-duty standards and other significant rulemakings related to vehicle electrification, fuels, and electricity generation. Significant time is required to read and respond to the voluminous material in each rulemaking docket, particularly given EPA's evident lack of rigor in its analysis, and lack of discipline in citing and characterizing underlying sources.

Despite EPA's assertions that the standards are technology-neutral, the reality is the proposed tailpipe-only approach is a *de facto* ban on ICEVs. AFPM does not oppose electric vehicles comprising an increasing share of the transportation mix, but we oppose regulations that are framed to ultimately ban ICEVs. EPA should establish standards, based on the full lifecycle of each vehicle class, that are achievable by each powertrain technology. ICEVs will continue to have a place in a diverse transportation future. This approach was summarized well in a 2021 report from the National Academies of Science:

> Internal combustion engines (ICEs) will continue to play a significant role in the new vehicle fleet in MY 2025–2035 in ICE-only vehicles, as well as in hybrid electric vehicles (HEVs) from mild hybrids to plug-in hybrids but will decrease in number with

> increasing battery electric vehicle (BEV) and fuel cell electric vehicle penetration. In this period, manufacturers will continue to develop and deploy technologies to further improve the efficiency of conventional powertrains, for ICE-only vehicles and as implemented in HEVs. Developments in the ICE for hybrids will advance toward engines optimized for a limited range of engine operating conditions, with associated efficiency benefits. Major automakers are on differing paths, with some focusing their research and development and advanced technology deployment more squarely on BEVs, and others more focused on advanced HEVs to maximize ICE efficiency.[6]

I. EPA's Proposal Does Not Comprehensively Address Cross-Cutting Issues

EPA's desire to remake the automotive sector creates significant energy and national security concerns and stresses an aging electrical grid subject to increasing demand. In glossing over these issues, EPA fails to adequately consider the mineral, metal, electricity generation, transmission, distribution, and charging infrastructure requirements necessary for the Proposed Rule to be feasible. This is alarming and undermines our energy security. We lack the supply of domestically sourced minerals and metals needed to build batteries and transmission lines and, contrary to the legislative intent of U.S. laws such as the Bipartisan Infrastructure Law ("BIL") and Inflation Reduction Act ("IRA"), we will have to rely on foreign countries to fulfill the Proposed Rule's mandate.

Even if we could import vast quantities of mineral resources, EPA's electrification mandate is unobtainable. We face a limited supply of copper, which is a critical mineral needed to build out the transmission grid to supply electricity to charging stations. We also do not have near the vehicle charging infrastructure necessary to power the mandated number of ZEVs. Rather than conducting a clear-eyed assessment of these challenges, EPA erroneously assumes that all the necessary conditions to enable its proposal will happen on its aggressive timeline. This conclusion dismisses or outright ignores a multitude of evidence to the contrary.

A. The Proposal Compromises Energy and National Security

1. Inadequate Minerals for Batteries Will Make Original Equipment Manufacturers ("OEMs") Dependent on Foreign Suppliers and Make it Difficult to Supply Electric Vehicles Required by this Proposal

The Russian invasion of Ukraine highlights the importance of assessing, planning, and mitigating risks to energy supplies. As we have seen with Europe, a strategy of supply diversification (e.g., increasing imports from a diverse pool of suppliers) is an important way to mitigate global supply disruptions.[3] The key tenet of risk mitigation is not about removing the likelihood of a risk but about reducing its impact to an acceptable level—the primary justification for the U.S. holding a Strategic Petroleum Reserve. The U.S. similarly holds a national defense commodity-based stockpile meant to decrease or prevent "dependence upon foreign and single

[3] "Europe's Reliance on Diverse Pool of LNG Sources Continues Year after Ukraine Invasion." Natural Gas Intelligence, 22 Feb. 2023, www.naturalgasintel.com/europes-reliance-on-diverse-pool-of-lng-sources-continues-year-after-ukraine-invasion/. Accessed 28 June 2023.

points of supply for strategic and critical materials needed in times of national emergency."[4] Exposing U.S. mobility to the risk of critical mineral supply availability raises an essential energy security question: How best does the U.S. trade risks it can mitigate for risks it cannot? But EPA fails to address this question in its Proposal. Rather, EPA largely limits its analysis to energy security impacts resulting from decreased fuel consumption and ignores the riskier implications of mandating reliance on an unstable, foreign-dominated supply chain, as evidenced by China's announcement this week that it is limiting exports of two rare earth minerals.[5]

The supply chain necessary to support new technologies contemplated by the Proposed Rule is far from assured and is likely to increase dependence on critical minerals from foreign sources. Reliance on a limited number of technologies (e.g., ZEVs) on the timeline required by the Proposed Rule will result in a non-resilient transportation sector that is vulnerable to unexpected disruptions and cost increases. For instance, both the federal government and the private sector recognized critical minerals are essential to the future of ZEVs.[6] Unstable critical mineral supply chains could disrupt this future. ZEVs, as compared to ICEVs, have a much 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.[7]

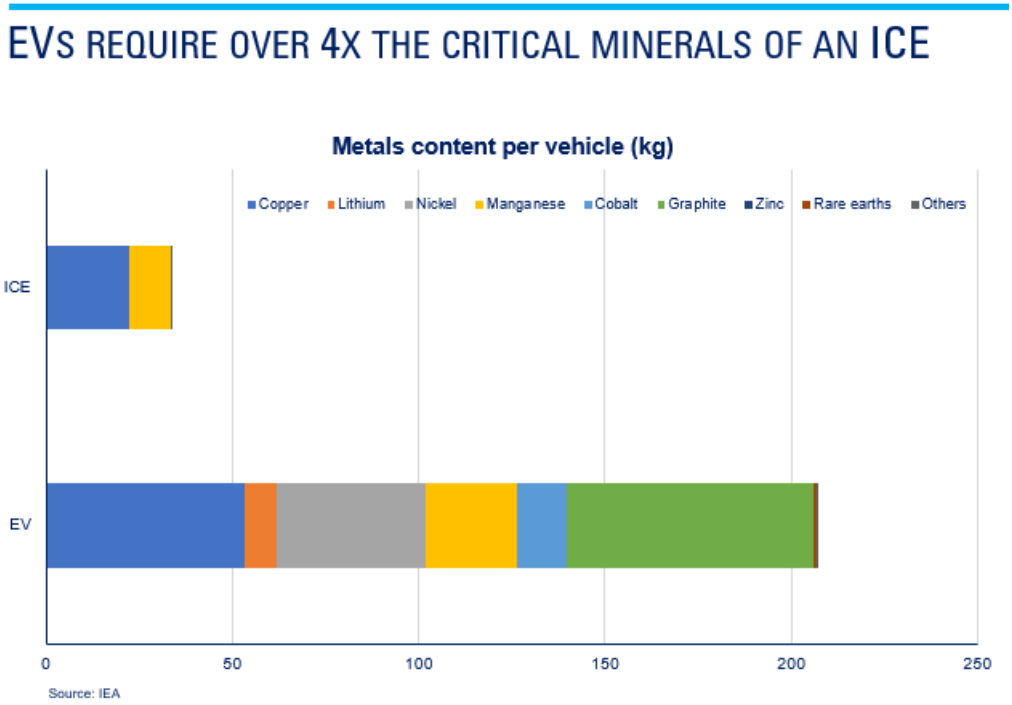
[4] CONGRESSIONAL RESEARCH SERVICE, "National Stockpiles: Background and Issues for Congress" (June 15, 2020) *available at* https://crsreports.congress.gov/product/pdf/IF/IF11574; CONGRESSIONAL RESEARCH SERVICE, "The Strategic National Stockpile: Overview Issues for Congress" (Jan. 25, 2023) *available at* https://sgp.fas.org/crs/misc/R47400.pdf.

[5] *See, e.g.*, Proposed Rule at 29,345, 29,388–90; Archie Hunter & Alfred Cang, *China Restricts Export of Chipmaking Metals in Clash with US*, July 3, 2023. Bloomberg. Available at China to Restrict Exports of Metals Critical to Chip Production - Bloomberg.

[6] Note that the term "zero emissions vehicle" ("ZEVs"), and even near-ZEVs as used by EPA, 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, EPA 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 plug in electric vehicles ("PEVs") such as plug-in hybrid electric vehicles ("PHEVs") and battery electric vehicles ("BEVs").

[7] 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].

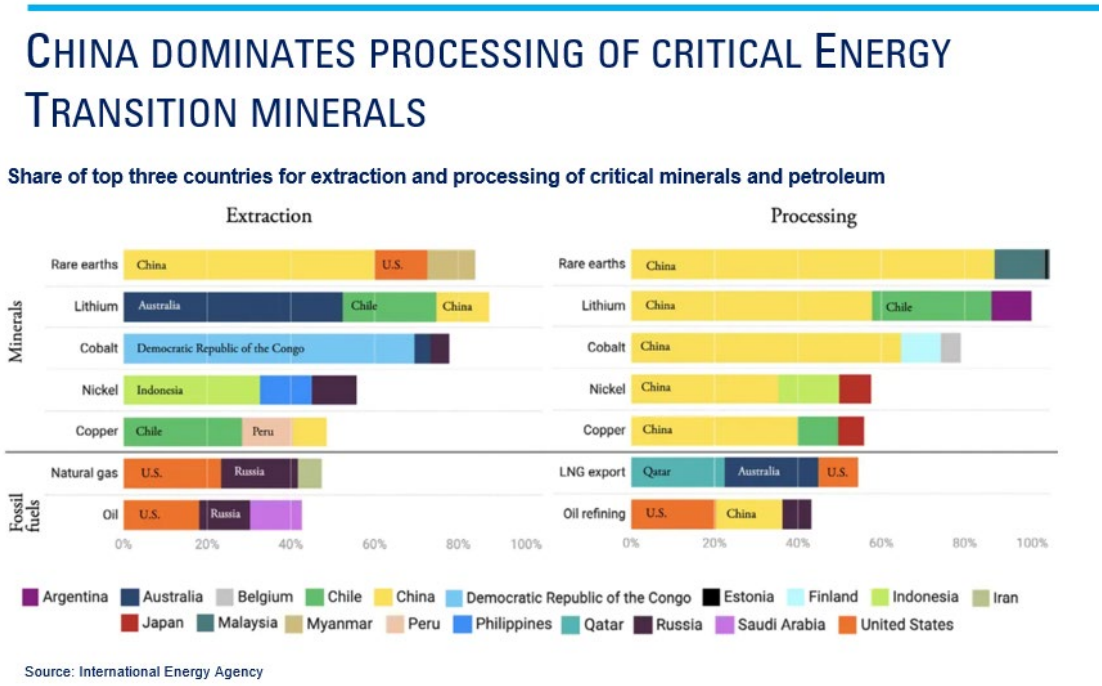
Figure 1: Metal intensity – ICEVs vs. EV[8]



Critical mineral supply, especially those essential to the manufacturing of a lithium-ion (Li-ion) battery, 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 ZEVs, China has disproportionate influence. While 70 percent of global cobalt production comes from the Democratic Republic of Congo,[9] most of those mines are owned/operated by China, and more than 60 percent of cobalt processing is in China. Moreover, 67 percent of the world's graphite is also produced in China.[10] The U.S. imports most of its manganese from Gabon, a less politically stable country, providing 65 percent of the United States' supply.[11]

[8] 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"].
[9] Id.
[10] G.R. Robinson, et al., U.S. GEOLOGICAL SURVEY, "Professional Paper 1802 Critical mineral resources of the United States—Economic and environmental geology and prospects for future supply" (Dec. 19, 2017) p. J1–J24, *available at* https://doi.org/10.3133/pp1802J.
[11] 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[12]

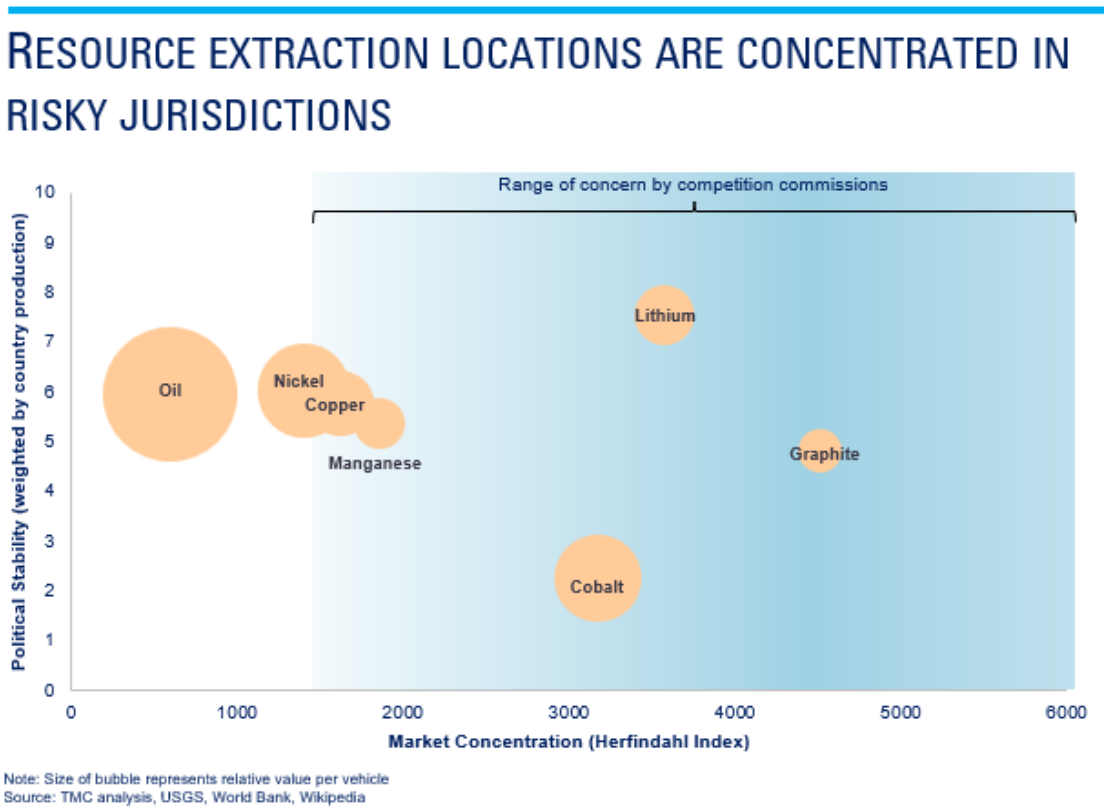


Expected supply from existing mines and projects under construction is estimated to meet only half of projected world demand for lithium and cobalt."[13]

In contrast to oil, which has a lower global market concentration than the critical minerals required for ZEVs, **Figure 3** shows that most critical materials for ZEVs are concentrated in less politically stable countries. Other than lithium production which is dominated by Australia (52 percent), all other critical ZEV 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) swings toward producers in less politically stable countries. If producer countries have market power, they 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 ZEV production, so a disruption in the supply of a single mineral can disable the entire supply chain. The operation of ICEVs, to the contrary, relies on a single natural resource for which there is an abundant domestic supply.

[12] Turner Mason Report.
[13] Axios Generate, The supply crunch that could slow the climate fight, (May 5, 2021).

Figure 3: U.S. risk exposure to critical energy resources[14]

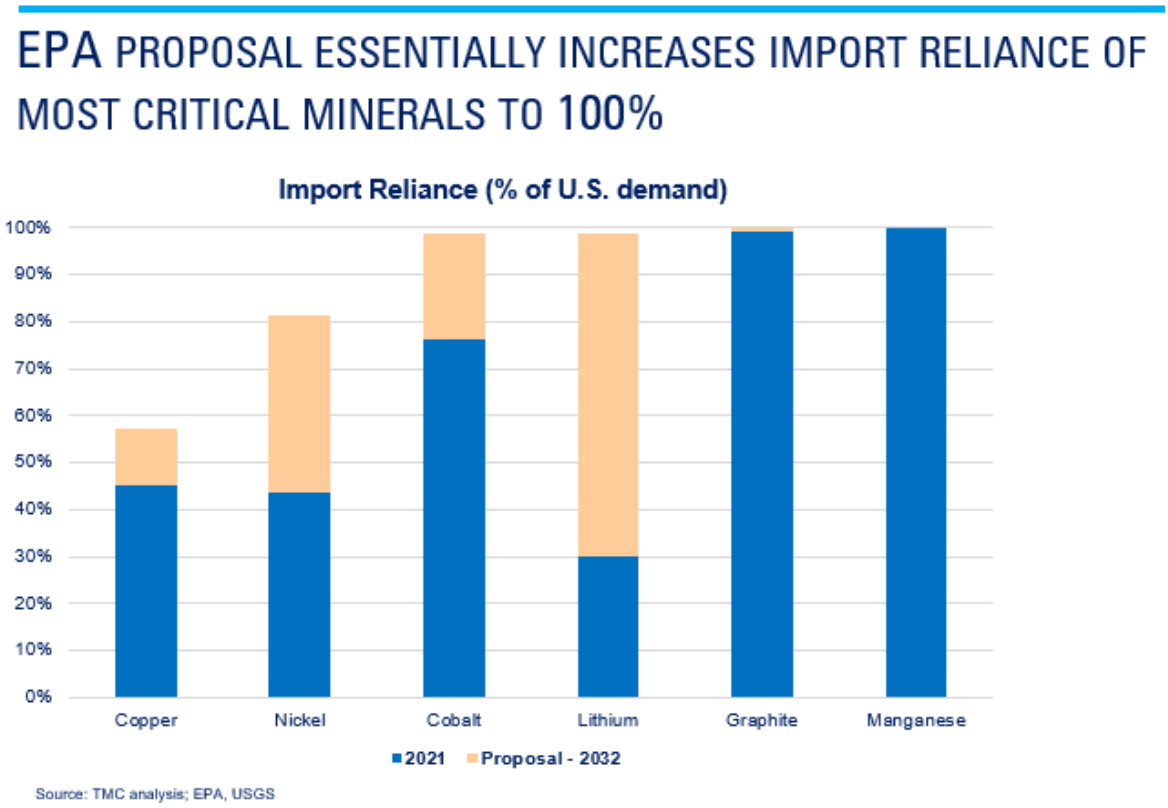


The supply chain necessary to support new technologies contemplated by the Proposed Rule is far from assured and is likely to increase dependence on critical minerals from foreign sources.[15] In the event of supply disruption or pricing volatility related to geopolitical pressures, the U.S. is highly exposed as it heavily relies on imports to satisfy domestic demand in each of these critical minerals.[16] **Figure 4** puts this import dependence in perspective. By 2032 the Proposed Rule would raise import dependence to 100 percent of U.S. demand for most minerals, and more than 50 percent for nickel and copper. Except for copper, the U.S. does not mine significant quantities of these critical minerals. And, despite the U.S. having substantial domestic copper mining, it still relies on imports to meet 45 percent of U.S. demand.

---

[14] Turner Mason Report.
[15] *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-cobalt-mine/article_efd97f32-d015-11ed-9424-bfb28220210c.html (describing suspension of construction at Idaho Cobalt Operations due to, in part, low cobalt prices).
[16] China announced it will restrict the export of two metals (gallium and germanium) used in EV production. While these metals are not particularly rare, China could limit export of processed key EV battery minerals to maintain its supply chain dominance. See Archie Hunter & Alfred Cang, *China Restricts Export of Chipmaking Metals in Clash with US*, July 3, 2023. Bloomberg, *available at* https://www.bloomberg.com/news/articles/2023-07-03/china-to-restrict-exports-of-metals-critical-to-chip-production.

Figure 4: U.S. import reliance of several critical minerals[17]



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).[18] Conversely, the United States plays a very small role in the global electric vehicle ("EV") supply chain, with only 7 percent of battery production capacity.[19]

This new demand for foreign-sourced materials will upset the decades of progress the U.S. made in energy security, where we are currently a net exporter of crude and refined petroleum products combined, and it will undermine the domestic security provided by our refining industry. Sourcing critical minerals and building a secure, North American supply chain for ZEVs is not guaranteed as foreign production and processing of critical minerals have an established, large market share and competitive advantage today. Because passenger vehicles have domestic manufacturing and sourcing requirements in the IRA to be eligible for the clean vehicle tax credit,

[17] Turner Mason Report.
[18] 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.
[19] *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.

compliance will be challenging.[20] Yet the proposal assumes, without basis, that virtually all batteries will qualify for the full tax credits and will achieve cost parity despite a significant increase in demand. In making this assumption, EPA ignores the obvious benefits of a multi-technology approach that would reduce the risks associated with a ZEV-focused approach. For example, Toyota recently noted in a memo to its dealers that "the amount of raw materials in one long-range battery electric vehicle could instead be used to make 6 plug-in hybrid electric vehicles or 90 hybrid electric vehicles . . . the overall carbon reduction of those 90 hybrids over their lifetimes is 37 times as much as a single battery electric vehicle."[21]

2. The Availability of North American Crude, Refining, and Biofuel Capacity Makes the United States 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. 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.[22] EPA's DRIA 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 require 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. This employment effect is not contemplated in EPA's analysis.

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. EPA did not assess the impact of likely refinery closures on military operations and readiness. Instead, the DRIA inexplicably focuses on a narrow aspect of energy security, choosing to describe the cost of protecting trade routes.

Shockingly, EPA provides no analysis of the impact of this rule on the U.S. biofuels or agricultural industries. The U.S. is the world's largest biofuels producer, yet a search of the DRIA reveals that the only mention of biofuels comes in a footnote describing the contents of an EIA Annual Energy Outlook table. Considering the implications for the biofuels industry, as well as the

---

[20] IRA, Section 45W(c) (The IRA requires 50% of the value of battery components to be produced or assembled in North America to qualify for a $3,750 credit and 40% of the value of critical minerals sourced from the United States or a free trade partner also for a $3,750 credit).
[21] William Johnson, TESLARATI, "Toyota releases new defense of lagging EV strategy" (May 18, 2023) *available at* https://www.teslarati.com/toyota-defends-ev-strategy/.
[22] EIA, "Oil imports and petroleum product explained" (Jun. 12, 2023) *available at* https://www.eia.gov/energyexplained/oil-and-petroleum-products/imports-and-exports.php.

significant impact it will have on the agricultural producers that supply the industry, this glaring omission underscores the arbitrary nature of this rulemaking.

The DRIA also relies on out-of-date cases from EIA's AEO 2021. In EIA's AEO 2023 released earlier this year, U.S. crude production is higher, 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 EPA's estimate of the reduction in U.S. imports of crude oil that result from the proposed rule.

Finally, EPA used a Low Economic Growth case from AEO 2021 to estimate the impact of the proposed rule on oil imports, rather than carrying out an analysis specific to the changes in demand that EPA projects to result from the proposed rule. Although demand in the Low Economic Growth Case is lower than in the Reference Case, the oil demand decreases in the Low Economic Growth case differ from the oil demand decreases EPA projects in Table 9-42 and there is no consideration of how those differences affect the oil security analysis.

B. The United States Lacks Copper and Aluminum Production Required for Grid Expansion

Beyond the ZEV itself, electricity networks need a large amount of copper and aluminum.[23] 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.[24] 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 demands of the Proposed Rule.

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.[25] 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.[26] Copper demand is expected to rise by 53 percent, while supply is expected to rise by only 16 percent.[27] 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

---

[23] IEA Report 2022.
[24] *Id.*
[25] Andy Home, "Global aluminum production pendulum swings back to China" (June 21, 2022) *available at* https://www.mining.com/web/column-global-aluminum-production-pendulum-swings-back-to-china/.
[26] IEA Report 2022.
[27] 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.

and 67 percent between 2020 and 2040.[28] 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[29]—not considering the anticipated increase in ZEV production anticipated by EPA's Proposed Rule.

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. 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.[30] "[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.''[31] Despite this Rule's unlawful push to transition to EVs, 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.[32]

Globally, regulatory approval for new copper mines is at its lowest level in a decade.[33] 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.[34] 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 administration, resulting in increased import dependence.[35]

---

[28] 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/0722/The-Future-of-Copper_Full-Report_14July2022.pdf.

[29] IEA Report 2022.

[30] 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/wp-content/uploads/2021/05/Infographic_SNL_minerals_permitting_5.7_updated.pdf.

[31] Jason Lindquist, Don't Pass Me By - With Many Steps Required, Mining Projects Face Trickiest Path To Approval, RBN Energy Blog (June 30, 2023) (Attachment 2).

[32] 88 Fed. Reg. 6308 (Jan. 31, 2023).

[33] 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-looming-supply-gap-without-more-mines-2023-04-20/.

[34] 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/.

[35] Jim Vinoski, FORBES, "There's Not Enough Copper for Our Electrification Plans–and Biden Is Making It Worse" (Apr. 28, 2023) *available at* www.forbes.com/sites/jimvinoski/2023/04/28/theres-not-enough-copper-for-our-electrification-plansand-biden-is-making-it-worse/?sh=19ca0a5d1fbf.

C. The Proposal's Deployment Timeline is Impracticable

EPA's emissions standards rely on the unsubstantiated assumption that the U.S. electricity and transmission grid and ZEV charging infrastructure will be available to charge the massive numbers of ZEVs that will enter the market. As outlined below, available data supports the Alliance for Automotive Innovation's conclusion that the timeline for EPA's standard is infeasible.[36]

1. There is Significant Doubt that the U.S. Electrical Grid and Transmission Grid Can Reliably Support this Proposal.

The Proposal will further strain our nation's electricity system as global electricity demand could increase 47 percent by 2050 based on 2021 projections of population and economic growth, alone.[37] In the U.S., the estimated increase in energy consumption is 15 percent by 2050, without consideration of EPA's Proposal. 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.[38] 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.[39] An author of the Princeton University's Net-Zero America Project[40] 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."[41]

Yet, our electricity generation and transmission system are increasingly challenged to keep up with current demand. As shown in **Figure 5**, the North American Electric Reliability Corporation's ("NERC") recent summer assessment shows roughly two-thirds of the U.S. faces increased resource adequacy risk in the summer of 2023.[42]

---

[36] 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 iv.

[37] Meghan Gordon and Maya Weber, S&P Global, "Global energy demands to grow 47% by 2050, with oil still top source: US EIA" (Oct. 6, 2021) available at https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/oil/100621-global-energy-demand-to-grow-47-by-2050-with-oil-still-top-source-us-eia#.

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

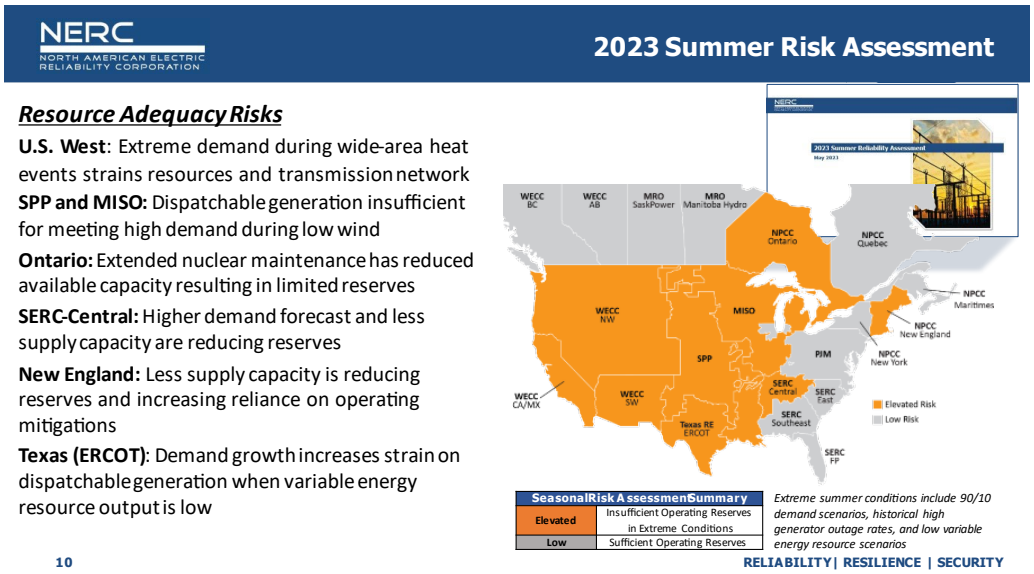
[39] Evan Halper and Timothy Puko, "Biden's Ambitious Climate Plans for EVs Face These Big Hurdles," The Washington Post, April 16, 2023.

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

[41] 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/big-affordable-effort-needed-america-reach-net-zero-emissions-2050-princeton-study. Accessed 28 June 2023.

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

Figure 5: NERC 2023 Summer Risk Assessment[43]



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.[44] 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).[45]

Future electricity demand is expected to grow due to government policies for EV adoption and energy transition programs. The California Energy Commission staff estimates that by 2030, 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 EV charging.[46] 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

---

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

[44] NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION, "2022 Long Term Reliability Assessment" (December 2022), *available at* https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_LTRA_2022.pdf.

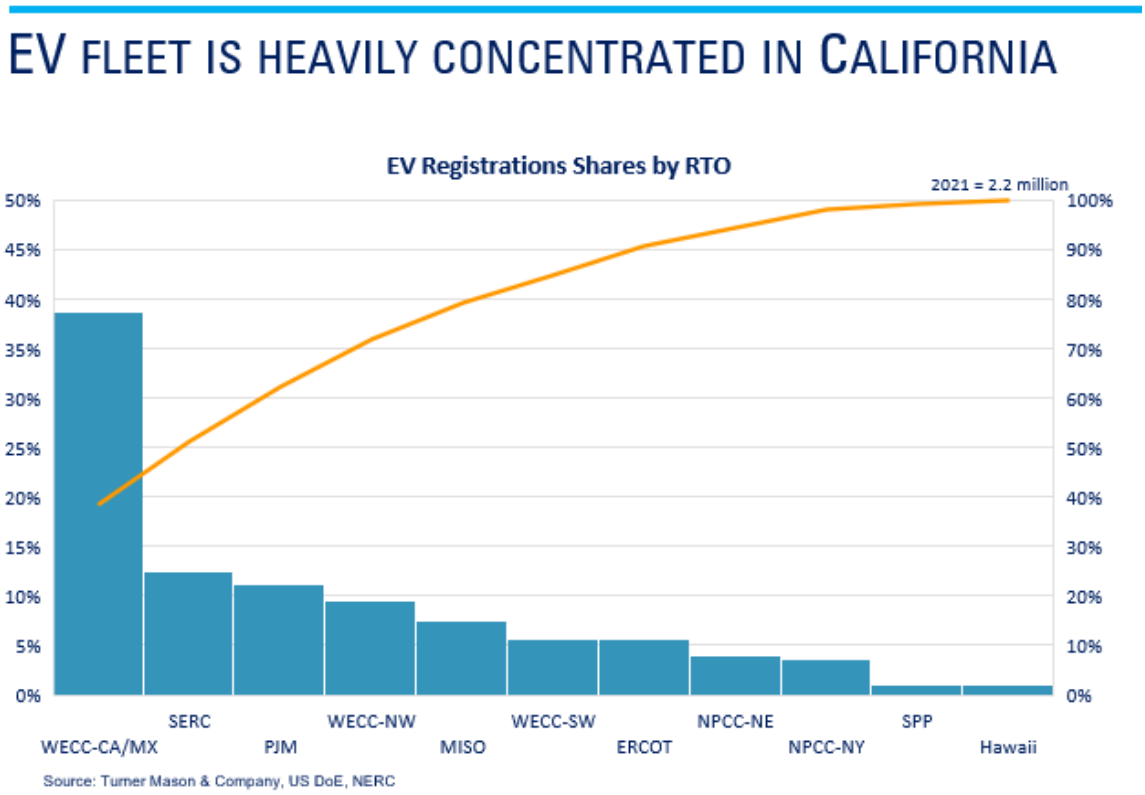
[45] NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION, "2023 Summer Reliability Assessment" (May 2023) at 23, *available at* https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2023.pdf.

[46] Id.

and daily load shapes.[47] 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."[48]

Although EPA projects ZEV sales on a national basis, the ability to charge the vehicles is driven by the ability of the RTOs and ISOs to manage regional or local power grids to supply electricity on demand. EPA's national data thus disguise important problems that increasing ZEV penetration will cause. By 2022, more than 50 percent of ZEVs were concentrated in California (WECC-CA/MX), Florida (SERC), and Texas (ERCOT).[49] The distribution of the ZEV fleet across RTOs can be seen in **Figure 6**, in which state shares of ZEV registrations are allocated across RTOs.[50]

Figure 6: ZEV registrations by RTO[51]

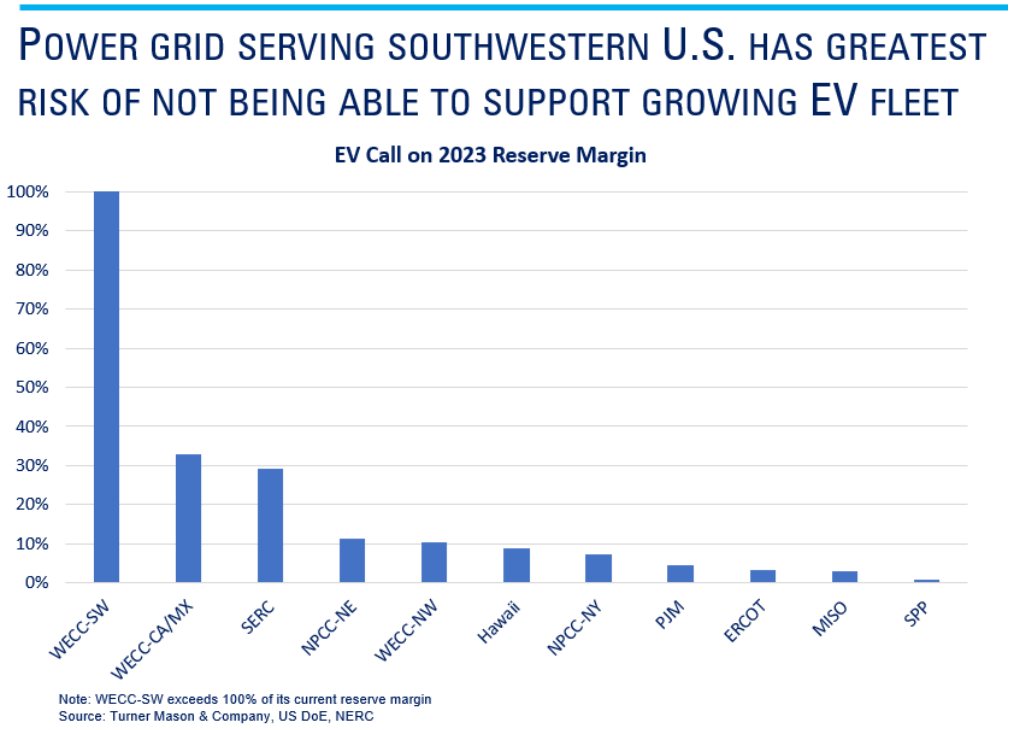


As seen in **Figure 7**, the greatest stress is not in California (although it is significant in California), but rather in the southwestern U.S.

---

[47] Id.
[48] https://www.cnn.com/2023/06/26/business/heat-wave-power-blackout/index.html
[49] 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.
[50] 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.
[51] Turner Mason Report.

Figure 7: EV Power Requirement by RTO[52]



In the southwestern U.S., for example, electricity demand from EV charging is expected to completely consume the 2023 reserve margin for the WECC-SW grid, leaving no reserve margin to address emergency conditions. This is based on EPA's estimate of ZEV electricity demand in 2032, allocated to RTOs, assuming no reserve capacity is added over the next eight years. For an RTO to fill incremental ZEV electricity demand and maintain its reserve margin, the required capacity investment will vary depending on the source of generation and that source's availability (*i.e.,* expected load factor) specific to that region. For the U.S. the total investment would be significant; the Brattle Group estimated an additional $75 to $125 billion total investment across the power sector at a ZEV penetration rate lower than EPA proposes.[53]

2. Required battery production is not feasible within the Proposal's time frame.

EPA severely overestimates the availability of minerals and the mining/processing infrastructure and capabilities in the U.S.[54] EPA's position in the DRIA that "PEV production in the U.S. need not be heavily reliant on foreign manufacture of battery cells or packs as PEV penetration increases and domestic mineral and cell production comes online" is unfounded.[55]

The development of natural resources projects, like critical mineral mining and processing, can easily require more than a decade. Increasing supply is not merely a matter of increasing

---

[53] Michael Hagerty, et al., "Opportunities for the Electricity Industry in Preparing for an EV Future" (June 2020).
[54] AAI Comments at iv.
[55] DRIA at 3-20.

current production. “The ability for the miners to quickly ramp up production of key ores is limited by regulatory hurdles and capital investment.” Globally, it takes on average more than 16 years to move mining projects from first discovery to production.[56] 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. 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.

Extracting critical minerals is challenging because most critical mineral ores exist in relatively low concentrations and the quality of the ore grade is declining. 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). 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. Mining capacity cannot be increased as quickly as required to meet the production rate required under the Proposed Rule, and at-scale recycling capabilities to remove these materials will not be available soon. EPA’s willingness to assume that global supply shortages of critical minerals will resolve themselves without specific analysis of how that problem will be addressed is another example of EPA ignoring an issue of central relevance to this rulemaking. EPA neglects to appreciate these limitations, rendering its Proposed Rule arbitrary and factually unsupported.

II. Banning the Internal Combustion Engine is a “Major Question” that Congress did not Delegate to EPA.

The Proposed Rule goes beyond imposing regulations that represent appropriate and feasible technological improvements in the efficiency of ICEVs; rather, it requires the manufacturing of ZEVs and ultimately phasing out ICEVs. Though EPA contends the proposed standards do not mandate a specific technology (e.g., ZEVs), the proposed standards are a de facto ZEV mandate requiring auto manufacturers to shift production away from ICEV and to ZEVs.[57] Consequently, the Proposed Rule obligates OEMs to increase the percentage of ZEVs they sell well more than market forces. EPA predicts that for MY 2032, the Proposed Rule will result in ZEV adoption rates between 62–78 percent across all body styles (sedans,

[56] IEA Report 2022.
[57] 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 iii.

crossovers/SUVs, and pickups).[58] This is a tremendous jump from the 8.4 percent of LDV production that was plug-in electric in 2022.[59] As a result, implementing this Proposal "requires massive changes from all sectors of the U.S. economy: from automotive suppliers to home builders to utilities, labor to mining to mineral processing."[60]

But the question of whether this shift is necessary and, if so, how to accomplish this shift, is a "major question" reserved for Congress, not EPA.

The "major questions doctrine" holds that Congress must "speak clearly when authorizing an agency to exercise [such] powers" of "vast economic and political significance."[61] And as EPA is aware, 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. 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.[62]

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."[63] 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."[64] The need for clear congressional authorization for such sweeping regulatory programs is nothing new – just last week the Supreme Court reaffirmed the major questions doctrine "as an identifiable body of law that has developed over a series of significant cases spanning decades."[65]

EPA's Proposed Rule here presents an analogous situation, albeit one with substantially greater costs. Mandating a rapid shift from ICEV to ZEV will reshape the American automotive

---

[58] Proposed Rule at 29,329; U.S. Environmental Protection Agency, "Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles Draft Regulatory Impact Analysis" (April 2023) pg. 13-36, 13-37, *available at* https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P10175J2.pdf [hereinafter, "DRIA"].
[59] Proposed Rule at 29,189 (identifying the percentage that was PEV, which included PHEVs and ZEVs).
[60] AAI Comments at iv.
[61] 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").
[62] *West Virginia v. EPA*, 142 S. Ct. 2587 (2022).
[63] *Id.* at 2613, n4.
[64] *Id.* at 2614.
[65] *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.

market with profound collateral effects, making clear that EPA is encroaching upon an issue of "vast economic and political significance." As further discussed herein, 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. EPA estimates that the cost of vehicle technology (not including the vehicle or battery tax credits) would be approximately $180 billion–$280 billion in addition to greater than $7 billion in electric vehicle supply equipment ("EVSE") costs through 2055. These figures do not include the transformation of the electric power sector and grid updates needed to meet the electricity demand created by the Proposed Rule, which is estimated to cost trillions of dollars.[66] EPA acknowledges that auto manufacturers are spending over a trillion dollars by 2030, mainly for manufacturing facilities. By setting emissions standards requiring production of a different product, the Proposed Rule undoubtedly forces OEMs to meet production deadlines that would not exist but for EPA's new ZEV mandate.

There are several issues included in the Proposal with impacts that go well beyond EPA's expertise, and the Agency is not positioned to fully grapple with the consequences that such a rapid push for ZEVs 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 that will not be offset by the "projected" job growth in the automotive sector.[67] It will significantly strain the electric grid, requiring utilities to rapidly increase generation, transmission, and distribution capacity to a degree not fully contemplated by EPA. 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. The fact that mandating ZEVs forces EPA to wade into all these areas outside of vehicle tailpipe emissions—as EPA must, to appropriately quantify emissions reductions and other impacts of the Proposal—shows that mandating a wholesale switch to vehicles for which the bulk of emissions occur upstream, rather than at the tailpipe, was not contemplated or provided for by Congress. Because the Proposed Rule raises a major question, EPA can only proceed if Congress clearly authorized EPA to do so. But Congress did not.

As with the Clean Power Plan, EPA lacks Congressional authorization in the Clean Air Act to impose a manufacturing-shifting standard to a preferred powertrain and effectively order regulated parties to phase out combustion engine technologies. EPA's standard-setting tools are limited to those which Congress provided in Section 202(a) of the Clean Air Act. Here, EPA is only authorized to set "standards" for "emission[s]" from "any class or classes of new motor vehicles or new motor vehicle engines, which . . . cause, or contribute to," potentially harmful air pollution. EPA has elected to focus solely on tailpipe emissions. But EPA acknowledges that ZEVs do not have tailpipe emissions of carbon dioxide, nitrogen oxides, non-methane organic gases, particulate matter, carbon monoxide, or formaldehyde, the pollutants of concern here, so the operation of such vehicles alone cannot "cause, or contribute to," air pollution within the constructs

---

[66] Dan Shreve and Wade Schauer, *Deep decarbonization requires deep pockets* (June 2019), https://www.decarbonisation.think.woodmac.com/ (The U.S. needs to invest $4.5 trillion to fully transition the U.S. power grid to renewables during the next 10-20 years, annual investments exceeding the U.S. defense budget).

[67] Proposed Rule at 29,393; DRIA at 4-59 (EPA admits that its proposal may affect employment for firms providing fuels: "Reduced consumption of petroleum represents cost savings for purchasers of fuel, as well as a potential loss in value of output for the petroleum refining industry, fuel distributors, and gasoline stations, which could result in reduced employment in these sectors.").

of a tailpipe emissions regulation, especially when EPA does not require vehicle manufactures to account for the upstream emissions from ZEVs in their compliance calculations.

Far from "clear congressional authorization," Section 202(a) provides EPA no authority to set standards that go beyond that which could be achieved by improvements to ICEVs alone such that OEMs are required to cease producing the underlying technology governed at the time the Clean Air Act was adopted and amended. Nor does it permit EPA to establish a fleet averaging and emission credit trading program as a mechanism to limit ICEV sales.[68] Notably, in its 1990 updates to the Clean Air Act, Congress instituted a clean fuel vehicles program with reference to "clean alternative fuel" vehicles, which includes ZEVs. In doing so, Congress explicitly distinguished such vehicles from "conventional gasoline-fueled or diesel-fueled vehicles of the same category and model year," dispelling the notion that ZEVs and ICEVs can be lumped together to set standards that will enable the former to eventually displace the latter.[69] EPA does not—and cannot—explain how such authority can be read to regulate ZEVs and ICEVs under a common standard, especially in light of the statutory language requiring EPA to set standards for any class or classes of vehicles. It is no surprise then that up until the current Administration, EPA has never claimed the authority to mandate even partial electrification.

Congress clarified that it, not EPA, must make the important policy decisions affecting if, when, and how the American automotive industry will transition from ICEVs to ZEVs. In the 116th Congress, for example, Congress introduced 44 bills seeking to reduce petroleum-based fuel consumption and GHG emissions from the transportation sector through customer rebates, vehicle and fuel producer incentives, local funding, development of standards, and research and development. Congress rejected bills that would have banned the sale of new light duty ICEVs by 2040[70] and it has consistently disapproved of EPA's efforts to hamstring the automotive sector with more stringent air pollution standards than are feasible.[71]

It should be no surprise then that in the wake of the Proposed Rule, members of Congress requested that the Agency rescind the proposals, asserting they "effectively mandate a costly transition to electric cars and trucks in the absence of congressional direction."[72] That Congress

---

[68] *See supra* II.A.
[69] 42 U.S.C. §§ 7581, 7582(b).
[70] *See* Zero-Emission Vehicles Act of 2019, H.R. 2764, 116th Cong. (2019); Zero-Emission Vehicles Act of 2018, S. 3664, 115th Cong. (2018); *see also* 116 Cong. Rec. 19238-40 (1970) (proposed amendment to Title II that would have banned ICEVs by 1978).
[71] *See, e.g.*, S. J. Res. 11, 118th Cong. (2023) (Although passed only by the Senate thus far, the joint resolution calls for disapproval of a similar rule submitted by the Administrator of the Environmental Protection Agency relating to "Control of Air Pollution From New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards," 88 Fed. Reg. 4296 (Jan. 24, 2023)).
[72] Letter from Senator Shelley Capito, et al. to Administrator Michael S. Regan, EPA (May 25, 2023); *see also* Senate Resolution S.J. Res. 11, 118th Congress (Apr. 26, 2023) (Although related to heavy duty vehicles ("HDVs"), Congress has expressed its disapproval of EPA's overreach in this space. For example, in April of this year both houses of Congress passed a Congressional Review Act resolution to rescind EPA's December 2022 heavy duty NOx standards, sending a strong signal that Congress views EPA's efforts in this space as unnecessary, infeasible, and uniformed in light of economic and energy security concerns); House Resolution H2523 (May 23, 2023); *see also* Congressional Record, H2523 (May 23, 2023) at 1444, Statement from Mr. Walberg (R-MI) ("From tailpipe emissions regulations that will force people to buy expensive and less practical EVs to new rules on power plants that will threaten the reliability of our electric grid. It seems like the EPA has not even thought about the economic and energy security of our constituents.").

intended for it, not EPA, to direct these policy decisions is made all the more clear by the passage of the IRA and the BIL whereby Congress identified the policy levers it deemed appropriate. Congress could have, but did not, delegate the authority to (or otherwise direct) EPA to establish a fleet-wide credit trading regime to further drive ZEV development and rapid adoption.

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[73] and, in 2022, must include billions of gallons of renewable fuel.[74] In fact, EPA's Proposal directly conflicts with the statutory framework that Congress provided in the RFS for lowering GHG emissions from the transportation sector. In the proposed rule, EPA cites only its authority under section 202(a) of the Clean Air Act and Executive Order 14037 as the basis for requirements that will extend from MY 2027 to 2032.[75] Because Executive Orders have no force of law,[76] EPA at bottom contends that a few general paragraphs of the Clean Air Act, enacted over 50 years ago, provides sufficient legislative authority and direction for the entirety of its proposed rule. But Congress demonstrated in the RFS that when it wants to transform the transportation sector, and specifically, when it desires to address GHGs associated with that sector, it does so with precision and within the context of a prescribed statutory framework.

III. The Proposed Rule Contravenes or is Otherwise Contrary to the Clean Air Act and Energy Policy and Conservation Act

A. EPA Lacks Statutory Authority Under the Clean Air Act.

1. The Clean Air Act Requires Standards With Which All Vehicles In A Class Can Comply

As set forth in detail in the brief appended as Attachment 1, EPA lacks statutory authority under Section 202(a) of the Clean Air Act to set fleetwide emission standards, and even if it had such authority, it could not lawfully use it to force electrification by including vehicles that have no tailpipe emissions in the fleetwide average standard for ICEVs. While EPA purports to rebut arguments that it lacks such statutory authority, EPA's own search for its expansive authority turns into a circular argument. If "Congress's focus was on emissions from classes of motor vehicles and the 'requisite technologies' *that could feasibly reduce those emissions*" as EPA suggests, it follows that those "requisite technologies" must be applied to directly reduce emissions from the vehicles on which they are installed.[77] And those technologies must remain with the vehicle for its useful life.[78]

The Proposed Rule results in fleet-wide standards that cannot be met by ICEVs alone; however, under the Clean Air Act, EPA may only set individual vehicle-level emission standards. Such standards must be for "emission[s]" from "any class or classes of new motor vehicles or new

---

[73] 42 U.S.C. § 7545(o)(2)(A)(i).
[74] *Id.*, § 7545(o)(2)(B); 87 Fed. Reg. 39,600 (July 1, 2022).
[75] 88 Fed. Reg. at 29,186.
[76] Rather, Executive Orders "simply serve as presidential directives to agency officials to consider certain policies when making rulemaking decisions." State of California v. EPA, No. 21-1018 (D.C. Cir. 2023), *Slip Op*. at 17.
[77] Proposed Rule at 29,231 (emphasis added).
[78] 42 U.S.C. § 7521(a)(1).

motor vehicle engines, which . . . cause, or contribute to," potentially harmful air pollution.[79] The plain language of this provision authorizes EPA to set standards for classes of *individual* vehicles or engines that emit air pollutants. As EPA acknowledges, EPA's "rules have historically not required the use of any particular technology, but rather have allowed manufacturers to use any technology that demonstrates the engines or vehicles meet the standards over the applicable test procedures."[80] This precedent is squarely at odds with the Proposed Rule, where "any technology" cannot be used to meet the proposed emission standards, which can only be met by phasing out ICEVs, distorting as well as exceeding EPA's authority to set standards to permit the "development and application of the requisite technology."[81]

EPA both describes ZEVs as having "zero emissions"[82] for purposes of compliance with its standards and is "proposing to make the 0 g/mile treatment of ZEV operation a permanent part of the program."[83] If so, then EPA's proposed standards that apply to ZEVs do not apply "to the emission of any air pollutant from any class or classes vehicles … that cause, or contribute to, air pollution."[84] In other words, EPA cannot have it both ways. It cannot claim to be regulating emissions from ZEVs while at the same time considering such vehicles to have no emissions.

The Clean Air Act does not provide EPA authority to regulate vehicles that have tailpipe emissions by including them within the same standards that apply to vehicles without tailpipe emissions. For LDVs specifically, emission standards must reflect "the greatest degree of emission reduction achievable through the application of technology which the [EPA] determines will be available" during the relevant model year.[85] The Supreme Court noted that similar language in Section 111(d) of the Act generally refers to "measures that would reduce pollution by causing [sources] to operate more cleanly."[86] Congress enabled EPA to increase emission standard stringency through cleaner fuels and improved emissions-related systems to be incorporated into ICEVs such as advances in fuel injection, exhaust gas combustion management, and advances in catalysts to neutralize pollutants of concern.[87] ZEVs are not similarly situated "technology" originally contemplated by Congress. To ensure compliance with emission standards under Section 202(a), Congress required "emissions-related systems" and accompanying "diagnostic systems" on each vehicle, underscoring its view that the vehicles subject to an emission standard emit the relevant pollutant in EPA's judgment.

In addition, by factoring in ZEV performance into standards broadly applicable to both ZEV and non-ZEV, utilizing averaging, EPA is ignoring the technological feasibility of emissions-related

---

[79] 42 U.S.C. § 7521(a)(1).
[80] *Id.* at 29,232. Moreover, while EPA suggests that the Clean Air Act's legislative history shows that Congress contemplated replacing the ICEV with ZEVs, *id*., such an interpretation is squarely at odds with the text of the statute. If EPA were to replace ICEVs with ZEVs – as the Proposed Rule would put it on track to do – each and every statutory reference to an "engine" would be meaningless as ZEVs do not have engines.
[81] 42 U.S.C. § 7521(a)(2).
[82] "As the term 'zero-emission vehicle' suggests, these cars and trucks have zero GHG and criteria pollutant emissions from their tailpipes." 88 Fed. Reg. at 29,187.
[83] *Id.* at 29,251,
[84] 42 U.S.C. § 7521(a)(1).
[85] 42 U.S.C. § 7521(a)(3)(A)(i).
[86] *West Virginia*, 142 S. Ct. at 2599.
[87] For example, Section 202(m) requires the monitoring of "emission-related systems" such as the "catalytic converter and oxygen sensor." 42 U.S.C. § 7521(m)(l).

systems and simply requiring the production of fewer ICEVs. This approach also ignores the fact that major automakers are on differing technological paths, as noted by the National Academies of Sciences, "with some focusing their research and development and advanced technology deployment more squarely on ZEVs, and others more focused on advanced HEVs to maximize ICE efficiency."[88] During the last two years, 17,000 research articles were published that focus on improving ICEVs or lowering their carbon footprint with liquid fuel technologies, such as lower carbon fuel production technologies, the substitution of lower carbon feedstocks and lower carbon fuels, and by optimizing fuel properties like octane.[89] Instead of focusing on advances to ICEV technologies when setting the standards, the Proposed Rule relies on ZEVs as the only relevant advanced technology, which is arbitrary and capricious given that many ICEV technologies, unlike mass adoption of ZEVs, "permit the development and application of the requisite technology" within the time necessary to comply with the forthcoming standards.[90]

And even for criteria pollutants emitted from ICEVs, the Clean Air Act says nothing about averaging across fleets or banking and trading credits across different model years, different vehicle classes, and OEMs. While EPA previously adopted fleetwide averaging, it has also acknowledged that "Congress did not specifically contemplate an averaging program when it enacted the Clean Air Act."[91] And "[j]ust as the statute does not explicitly address EPA's authority to allow averaging, it does not address the Agency's authority to permit banking and trading."[92] By definition, then, the Act does not address—let alone clearly authorize—the use of averaging, banking, and trading in a manner that mandates electrification of the national vehicle fleet of motor vehicles and motor vehicle engines. Instead, as EPA acknowledges, even if its authority to use averaging, banking, and trading could be inferred, such programs are limited to compliance flexibilities rather than setting the standards with which vehicles must comply or phasing out ICEVs on a national scale.[93]

The structure of the Clean Air Act and its regulatory provisions for standard setting, certification, compliance enforcement, warranties, and penalties also directly conflict with a fleet-wide averaging regulatory regime. Notably, under Section 202(a), EPA "shall test, or require to be tested in such manner as [it] deems appropriate, any new motor vehicle or new motor vehicle engine submitted by a manufacturer" and issue a certificate of conformity "if such vehicle or engine" complies with the standards.[94] And EPA must "test any emission control system incorporated in a motor vehicle or motor vehicle engine . . . to determine whether such a system enables such vehicle or engine to conform to the standards required to be prescribe under [Section 202(b)]" of the Act.[95] EPA's use of a fleetwide averaging regulatory regime directly conflicts with the statutory provisions that Congress already included to provide manufacturers with compliance flexibility. For example, section 202(b)(3) provided compliance flexibilities for

---

[88] National Academies of Sciences, Engineering, and Medicine. 2021. Assessment of Technologies for Improving Light-Duty Vehicle Fuel Economy—2025-2035. Washington, DC: The National Academies Press. p. 369. https://doi.org/10.17226/26092.
[89] Fuels Institute. *Literature Review Summary: Future Capabilities of Combustion Engines and Liquid Fuels*. Nov. 2022.
[90] 42 U.S.C. § 7521(a).
[91] 48 Fed. Reg. 33,456, 33,458 (July 21, 1983)
[92] 54 Fed. Reg. 22,652, 22,665 (May 25, 1989); *see* 55 Fed. Reg. 30,584, 30,593 (July 26, 1990) (same).
[93] Proposed Rule at 29,196-97 (describing averaging, banking, and trading provisions as "help[ing] manufacturers to employ a wide range of compliance paths").
[94] 42 U.S.C. § 7525(a)(1).
[95] 42 U.S.C. § 7525(a)(2).

NOx, but only for no "more than 5 percent of [a] manufacturer's production or more than fifty thousand vehicles or engines, whichever is greater."[96] This provision would be nonsensical under a fleetwide-averaging regime where, if applied, an OEM could give itself a waiver for large swaths of its fleet by over-complying for certain product lines well beyond its 5 percent or 50,000 vehicle allotment.[97] Together, the Clean Air Act regulatory framework contemplates EPA regulating vehicles individually. But this cannot be accomplished if there is not a clear emission standard applicable to a single vehicle at the start of a model year.

Moreover, EPA's Proposal further conflicts with the Clean Air Act by establishing a new class of medium duty vehicles that conflicts with the plain language of the CAA defining heavy-duty vehicles. Congress created specific lead time requirements for heavy-duty vehicles to ensure technological feasibility: "Any standard promulgated or revised under this paragraph and applicable to classes or categories of heavy-duty vehicles or engines shall apply for a period of no less than 3 model years beginning no earlier than the model year commencing 4 years after such revised standard is promulgated."[98] In the Proposed Rule, EPA lumps a newly-defined category of Class 2b and 3 "medium-duty vehicles" (with a gross vehicle weight rating between 8,501 and 14,000 pounds) in with light-duty vehicles. But medium-duty vehicles are actually "heavy-duty vehicles" under the Clean Air Act, which defines "heavy-duty vehicle" as "a truck, bus, or other vehicle manufactured primarily for use on the public streets, roads, and highways (not including any vehicle operated exclusively on a rail or rails) which has a gross vehicle weight (as determined under regulations promulgated by the Administrator) ***in excess of six thousand pounds***."[99] Presuming the Proposed Rule results in a final rule promulgated in 2024, any new standards for Class 2b or 3 vehicles cannot apply until model year 2028.[100] Furthermore, EPA is ignoring Congressional direction to issue separate standards for heavy-duty and light-duty vehicles by comingling them into the same fleet averaging, banking, and trading program (which is also unlawful, see Section III.A.1).[101]

2. EPA Fails to Adequately Evaluate ZEV Safety Risks as Required by Clean Air Act Section 202(a)(4)(B).

In setting new emissions standards, EPA must consider whether any technology used to comply with the requirements "will cause or contribute to an unreasonable risk to public health, welfare, or safety in its operation or function."[102] The Proposed Rule's health and safety assessment, however, is myopically limited to the health effects of tailpipe emissions and fails to fully account for all of the risks posed by ZEV mandates. Increased prices to the consumer resulting from EPA's proposed rule (when purchasing a new vehicle) likely will delay the purchase of all vehicles subject to the rule and slow fleet turnover. For example, nowhere in the Proposal

---

[96] 42 U.S.C. § 7521(b)(3).
[97] While Clean Air Act Section 202(b)(3) is specific to legacy light-duty vehicles through model year 1985 subject to a 1.5 grams/mile NOx standard and no longer directly applicable, the provision is incongruent with fleet-wide averaging, and no associated amendments to Section 202(a) would support a different reading today.
[98] *Id.*, § 7521(a)(3)(C).
[99] *Id.*, § 7521(b)(3)(C) (emphasis added).
[100] EPA's promulgation of standards for medium duty vehicles and light duty trucks along with other light duty vehicles is arbitrary and capricious as EPA itself recognizes that its approach – "for regulatory purposes" – differs from the statutory definition of heavy-duty vehicles in the Clean Air Act. *See* 88 Fed. Reg. at 29226, n. 382.
[101] *See* 42 U.S.C. § 7521(a)(3)(B) (recognizing additional requirements for heavy-duty vehicles).
[102] 42 U.S.C. § 7521(a)(4)(A).

does EPA assess how slower fleet turnover impacts safety and the environment. Older vehicles have fewer safety features and higher emissions profiles than new vehicles. Other interested parties have raised safety issues that EPA has a duty to analyze.[103] EPA must analyze and take comment on the safety issues associated with ZEV mandates prior to finalizing the Proposed Rule.

B. The Proposed Rule Contravenes the Clean Air Act's Direction that EPA's Regulations be Technologically Feasible

Section 202(a)(2) requires EPA to provide lead time to "permit the development and application of the requisite technology."[104] But, as discussed in Section IV.B, EPA's overly-aggressive demands for electrification cannot be supported—there will not be sufficient infrastructure to generate and transmit electricity and charge the vehicles EPA is requiring OEMs to produce. EPA has simply failed to provide both the OEMs, as well as the ancillary services required to sustain an electrified fleet, with enough time to develop the necessary infrastructure.[105] EPA's failure to adequately ensure sufficient infrastructure demonstrates that it is not providing sufficient lead time to "permit the development and *application* of the requisite technology, giving appropriate consideration to the cost of compliance within such period."[106]

Relatedly, Congress established the need to consider technology feasibility in establishing fuel economy regulations under the Energy Policy and Conservation Act ("EPCA"). Here, the National Highway Traffic Safety Administration ("NHTSA") "may not consider" the fuel economy of EVs in setting Corporate Average Fuel Economy (CAFE) standards.[107] Conducting joint EPA-NHTSA rulemakings for complementary GHG and CAFE requirements helps OEMs comply with both agencies' standards. But in forgoing joint rulemaking, EPA ignores Congress' determination that EVs cannot be considered when determining what is the maximum *feasible* fuel economy level from which to develop regulations. Allowing EPA to consider EVs and, in turn, establish *de facto* ZEV mandates (and *de facto* average fuel economy standards) ultimately skews the new vehicle market and impede NHTSA's ability to establish its own CAFE standards that comport with EPCA. Most importantly, such an approach directly contravenes the underlying premise of the Supreme Court's holding in *Massachusetts v. EPA* that "[EPA and NHTSA] obligations may overlap, but there is no reason to think the two agencies cannot both administer their obligations and yet avoid inconsistency."[108] After implementing GHG standards jointly with NHTSA's fuel economy standards since 2012, and despite Government Accountability Office recommendations to the contrary,[109] EPA separated the rulemaking to undo previously established MY 2023-2026 standards and, in this case, to avoid the direct statutory prohibition on consideration of EVs when establishing fuel economy standards.

---

[103] *See, e.g.*, https://www.nhtsa.gov/sites/nhtsa.gov/files/documents/12848-lithiumionsafetyhybrids_101217-v3-tag.pdf.
[104] 42 U.S.C. § 7521(a)(2).
[105] See AAI Comments at ii-iv.
[106] *Id.* (emphasis added).
[107] 49 U.S.C. § 32902(h). Here, NHTSA may not consider the fuel economy of "dedicated automobiles," which are defined as those that operate only on "alternative fuel." Alternative fuel, in turn, includes electricity. 49 U.S.C. § 32901(j).
[108] 549 U.S. 497, 532 (2007).
[109] GOVERNMENT ACCOUNTABILITY OFFICE, "NHTSA and EPA's Partnership for Setting Fuel Economy and Greenhouse Gas Emissions Standards Improved Analysis and Should be Maintained" (February 2010) *available at https://www.gao.gov/assets/gao-10-336.pdf*

As EPA considers the technological feasibility of its Proposal, it should further consider the OEMs' position that they will not possess adequate resources to adapt to these stringent requirements within the prescribed timeframe, especially in light of increasing global supply chain issues and price increases associated with battery demand.[110] EPA's proposal will require an unprecedented rate of vehicle technology change that the nation and OEMs have never experienced before.

C. In the Alternative, EPA Should Set Separate Emissions Standards for Each Vehicle Class.

The Clean Air Act authorizes EPA to establish and revise standards for the emissions of air pollutants from "any class or classes of new motor vehicles or new motor vehicle engines….that endanger public health or welfare"[111] Assuming for sake of argument EPA has authority to set emissions standards for EVs, which we posit it does not,[112] EPA should promulgate distinct emissions standards for each vehicle class on the basis of the vehicle's powertrain (e.g., diesel, gasoline, natural gas, electricity). At a minimum, this would obligate EPA to abandon its position that ZEVs are emission-less and account for upstream and other lifecycle emissions as the agency envisioned in its 2012 rule.[113] This approach would ensure that EPA is regulating relevant pollutants from specific vehicle classes and would promote a level playing field for different vehicle technologies.[114]

ZEVs are entirely distinct from other classes of vehicles. Their powertrain design frontloads emissions, meaning the air pollutants associated with these vehicles are emitted before operation (*i.e.,* during vehicle production and recharging). During operation, a ZEV experiences no direct drivetrain emissions. In contrast, most emissions from ICEVs generally occur during operation, not production and refueling. Such different emissions points require different regulatory standards.

EPA recognized the need to treat different motor vehicle technologies differently. In previous rulemakings, EPA distinguished between Otto-cycle (primarily gasoline-fueled vehicles) and diesel heavy-duty vehicles.[115] EPA also differentiated between gasoline- and diesel-fueled vehicles and those operated on natural gas.[116] And more than 30 years ago, EPA promulgated specific standards for methanol-fueled vehicles.[117] The regulations varied emission-control

---

[110] AAI Comments at ii-iv.
[111] 42 U.S.C.§ 7521(a)(1).
[112] As discussed in Section III.A., *supra*, the CAA sec. 202 does not authorize EPA to regulate ZEV emissions because EPA characterizes them as having "zero" emissions.
[113] 75 Fed. Reg. 25,324, 25,341 (May 7, 2010).
[114] 42 U.S.C. § 7521(a)(3)(A)(ii) ("In establishing classes or categories of vehicles or engines for purposes of regulations under this paragraph, the Administrator may base such classes or categories on gross vehicle weight, horsepower, type of fuel used, or other appropriate factors."). Although this section of CAA Section 202 references "heavy-duty" vehicles, this applies to light-duty vehicles that weigh more than 6,000 lbs gross vehicle weight rating, such as light-duty heavy trucks, and if EPA has authority to set emissions standards for EVs, the Clean Air Act does not otherwise limit EPA's discretion to expand its classification of vehicles by fuel type.
[115] See e.g., 40 C.F.R. §§86.098-10, 86.099-11.
[116] 59 Fed. Reg. 48472 (Sept. 21, 1994).
[117] 54 Fed. Reg. 14426 (April 11, 1989).
[117] *Id.* at 14428.

requirements based on fuel type.[118] For example, in promulgating regulations for methanol-fueled vehicles, EPA explained that "because the design and function of methanol vehicles is very much like that of their petroleum counterparts, the methanol emission control requirements are comparable (in most cases identical) to those already in existence."[119] At the same time, within the methanol vehicle rule, EPA noted that *"in some future cases, this criterion may not be sufficient to adequately determine the classification of a vehicle . . .* [EPA] may need to take into account other relevant factors, such as compression ratio, combustion characteristics, characteristics of the engine's operating thermodynamics, or intended in-use duty cycle."[120] In other words, EPA recognized the varying methods of converting energy into motive power could require different criterion (classification) for regulating different vehicles. And the agency did so in circumstances where the drivetrain technologies were substantially more similar to ZEV than to ICEV. To remain consistent in its regulatory approach, were EPA to have the authority to set emissions standards for ZEVs, it must promulgate separate emission standards that apply solely to ZEVs.

AFPM suggests that EPA establish separate emission standards based on the lifecycle emissions of a ZEV and ascribe those emissions to the vehicle over its useful life. Previous regulatory history supports such an approach.

For example, while EPA did not set widely varying emission standards for methanol-fueled vehicles versus "conventionally fueled" vehicles, the Agency discussed how lifecycle emissions were relevant to its determination of Clean Air Act vehicle emission standards:

> Methanol vehicles could have an impact on global warming (i.e., the "greenhouse effect") as well. While increased combustion efficiency may result in lower carbon dioxide (CO_2) emissions from methanol-fueled vehicles compared with petroleum-fueled vehicles, the overall impact of a shift to methanol-fueled vehicles on global warming is uncertain. *The analysis of the impact must include the effect of not only emissions from the vehicles, but also emissions from methanol production.*
>
> * * *
>
> In the long-term, the implications of using methanol as a transportation fuel are difficult to predict. Should petroleum and natural gas prices rise substantially, it is probable that methanol would be produced from coal. Assuming vehicle miles traveled, and other factors remain constant and assuming current process technology, *a methanol-fueled system using methanol derived from coal could result in as much as a doubling of the motor vehicle contribution to the greenhouse effect relative to the contribution of current petroleum fuels*.[121]

EPA's continued reliance on attribute-based regulation of light duty vehicles which focuses solely on the "footprint" of a vehicle cannot be justified in relation to the larger goals expressed in

---

[118] See, e.g., 40 C.F.R. §80-090-8(a)(1)(A)-(B), differentiating as between hydrocarbon standards for petroleum-fueled vehicles and organic material hydrocarbon equivalent for methanol-fueled vehicles; §86.090-11, imposing different standards for 1990 and later MY Otto-cycle heavy-duty vehicles from same weight methanol-fueled vehicles.
[119] *Id.* at 14428.
[120] *Id*. at 14429.
[121] *Id.* at 14451-2.

the Proposed Rule. The statute directs EPA to address "class or classes" of vehicles and EVs constitute such a severable class where emissions must be considered based on the full attributes (including lifecycle GHG emissions) of that class of vehicles.

The current Proposal tilts the scale in favor of EVs by proposing emissions standards that only a ZEV can meet, resulting in a de facto ban of ICEVs. EPA should instead consider an approach that accounts for the actual transportation related emissions rather than ignoring the upstream emissions of EVs and suggesting they are "zero." Setting emission standards that are technologically achievable would allow OEMs to reduce carbon emissions from each powertrain in a cost-effective manner. This would provide parity and fully account for total emissions impacts across multiple vehicle technologies.

IV. The Proposed Rule is Arbitrary and Capricious

Even if EPA had Congressional authority to promulgate the Proposed Rule, which it does not, the Proposal is substantively deficient and based on illogical reasoning and incomplete analysis. Therefore, it constitutes arbitrary and capricious decision-making.

A. Advanced Clean Cars II ("ACC II") Cannot be a Basis for this Rulemaking

EPA points to California's ACC II program and adoption by Section 177 states to support its projections of increased PEV penetration,[122] but the ACC II has not received a waiver, and EPA did not even have the waiver application when the Proposed Rule was published.[123] 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. As Principal Deputy Administrator for the Office of Air and Radiation Joe Goffman testified on June 21, 2023, EPA just received the waiver request. Given that the EPA official responsible for overseeing the California waiver request publicly acknowledged that EPA has not determined whether it will grant a waiver for ACC II, the Agency cannot rely on ACC II as a basis for this Proposal. 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 is NOT eligible for a waiver and ACC II is preempted. EPA's reliance on ACC II as support for this rule is pre-decisional and another example of arbitrary and capricious decision-making.

B. The Proposed Rule is Impracticable

1. EPA's Proposed Rule Ignores the Reality of Current ZEV Production.

In describing the need for this regulatory action, EPA suggests that rapid electrification resulting from the Proposed Rule either is already in progress or aligned with the automotive industry. In support, EPA cites public statements of the automotive industry to justify the proposed standards.[124] Representing 42 car companies, automotive suppliers, and automotive technology

[122] Proposed Rule at 29,118.
[123] 88 Fed. Reg. 29,189; *See, e.g.*, Initial Br. For Private Petitioners, *State of Ohio, et al. v. Envt'l Prot. Agency*, et al., No. 22-1081 (D.C. Cir. Oct. 24, 2022).
[124] Proposed Rule at 29,329.

companies that produce about 97 percent of the new vehicles sold in the United States, the Alliance for Automotive Innovation (AAI) submitted the following comments on this Proposal:

- The proposed GHG and criteria pollutant standards "are neither reasonable nor achievable in the timeframe covered in this proposal";[125]

- EPA's proposal cannot be met "without substantially increasing the cost of vehicles, reducing consumer choice, and disadvantaging major portions of the United States population and territory";[126]

The Proposed Rule's standards exceed even the public aspirations of OEMs' vehicle and market share targets.

EPA likewise assumes that the IRA and the BIL funds will be adequate to build the necessary electrification infrastructure. It is uncertain that (1) critical minerals will be available to manufacture ZEV batteries (see Section I.A.1); (2) consumers will buy EVs at the rate assumed by EPA (see Section IV.B.2); and (3) there will be ample electricity to power these vehicles (see Sections I.B and IV.B.3).[127] What is certain is that the Proposal's timeline is unachievable and completely detached from reality.[128] EPA also improperly relied on the general characterization of recent years of the light-duty and medium-duty market as supplemented by incentives in the BIL and IRA to support its proposition that there will be a rapid increase in ZEV market penetration. Setting aside the laws of supply and demand and the fact that the future availability of ZEVs is insufficient to meet the ZEV adoption requirements proposed by EPA (as discussed further below), EPA improperly relies on the number of models currently available on the free market as a surrogate for the number of actual units sold and in use. The underlying reality is that without federal regulation requiring vastly increased ZEV penetration, providing automakers certainty for long-term planning, automakers could not financially justify long-term investment in a technology with tepid consumer demand. The referenced electrification projections may be a function of OEMs striving to create certainty and minimize risk as they attempt to comply with forthcoming regulations. Indeed, the CEO of the Alliance for Automotive Innovation recently questioned the feasibility of the Proposed Rule – stating that the proposal was too aggressive and could benefit China:

> I've said the EPA proposal wasn't feasible without certain public policies and in light of today's market and supply chain conditions . . . . There's not enough charging and uncertain utility and grid capacity. Here's the big one – and where China looms largest – essentially no domestic or allied supply of battery critical minerals,

[125] 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 ii.
[126] *Id.*
[127] *Id*.
[128] Id.

> processing, and components until 2025 (and even then, nowhere near enough to supply what's needed).[129]

EPA notes that many OEMs and battery manufacturers announced plans to build gigafactories in North America due to government incentives like the IRA. But these are extraordinarily complex projects that will take many years to materialize if they progress to the point of battery production. In the DRIA, EPA states that, based on construction announcements by major automakers, "the U.S. will have more than 800 GWh of cell or battery manufacturing capacity by 2025, and ~1000 GWh by 2030, enough to supply from 10 to 13 million BEVs per year."[130] By contrast, Wood Mackenzie projects U.S. capacity of less than half that level, at 422 GWh/ year in 2030,[131] because many projects have failed to materialize or are delayed as market and other conditions change.

Regardless of the purported capacity, it is unlikely 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.[132] This step in the value chain could potentially create a critical bottleneck, in stark contrast to EPA's assumed 998 GWh capacity by 2030. Given the disparity in forecasts from different reputable sources, EPA's technology feasibility assessment should factor in sensitivity cases and acknowledge potential disruptions in the supply chain. Including such sensitivity cases is fully justified given EPA's experience in projecting available volumes of cellulosic biofuel for purposes of the RFS. EPA consistently overestimated production of liquid cellulosic biofuel from Cellulosic Biofuel Production 2010–2013 (RINs).

EPA's overreliance on the BIL, IRA, and California's unlawful ACC II further underscores the insufficiency of the Proposal's analysis. Citations to the BIL and IRA are speculative at best. Moreover, ACC II is not in effect and still requires a waiver. EPA cannot prejudge the outcome of that regulatory process before it even publishes the waiver package for public comment.

2. EPA's Proposed Rule Commands Impractical Adoption Rates.

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

---

[129] John Bozzella, EPA's EV Rules: What it Means for China and the U.S Auto Market. June 12, 2023, *available at* https://www.autosinnovate.org/posts/blog/epas-ev-rules-what-it-means-for-china-and-the-us-auto-market (accessed June 23, 2023).
[130] DRIA at 3-20.
[131] 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/.
[132] BENCHMARK 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.

indeed government subsidies, can vanish in an instant, through changes in administrations or judicial challenges.

As EPA acknowledges, the facts show that only between 2.2 and 4.4 percent of light duty vehicles *produced* in 2021 were electric, rising to about 8.4 percent in 2022.[133] Production may or may not translate into sales and vehicle registration. State-by-state EV registration data shows that the percentage of EV registrations relative to all registered vehicles ranged from 0.15 percent in Mississippi to 4.01 percent in California.[134] Thus, the ambitions of even the most aggressive OEM from a ZEV adoption rate perspective would require unprecedented sales over the next seven years.[135]

EPA offers no support for its conclusion that there will be substantial consumer adoption of ZEVs to achieve the increases projected by the Proposed Rule. To the contrary, recent polling shows 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 an EV 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 how EPA can predict that ZEV sales will reach 67 percent in 2032.[136]

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.[137] At this pace, more than 14 million new ICEVs will be purchased during 2023.[138] With the continued sales of ICEVs, this Rule's effort to limit the ability to purchase ICEVs, and more than 50 percent of ICEVs remaining in service, it is mindboggling, as discussed in Section IV.6 below, that EPA never considered the alternative scenarios using vehicle technologies and lower carbon fuels.

EV charging infrastructure, range, and charging time remain top concerns for nearly half of U.S. customers.[139] OEMs expect that ZEV penetration will not be uniform across markets, with

---

[133] Proposed Rule at 29,189; Sebastian Blanco, Car And Driver, "Strict EPA Rules for 2027 – 2032 Vehicles Announced, Garnering a Range of Reactions" (Apr. 13, 2023) *available at* https://www.caranddriver.com/news/a43546970/new-strict-epa-mpg-rules-for-2027-2032-vehicles/.
[134] 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.
[135] VOLVO GROUP, "Report on the first quarter 2023," *available at* https://www.volvogroup.com/content/dam/volvo-group/markets/master/news/2023/apr/4519530-volvo-group-q1-2023.pdf; TUBES AND LUBES DAILY, "Volvo launches electric truck with longer range in N. America" (Jan. 2021) *available at https://www.fuelsandlubes.com/volvo-launches-electric-truck-with-longer-range-in-n-america/?mc_cid=b124969b23&mc_eid=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-and-presentations/annual-reports/AB-Volvo-Annual-Report-2022.pdf.
[136] Megan Brenan, Gallup, Most Americans Are Not Completely Sold on Electric Vehicles (April 12, 2023). Retrieved a https://news.gallup.com/poll/474095/americans-not-completely-sold-electric-vehicles.aspxt .
[137] John Eichberger, *Decarbonizing Combustion Vehicles – A Critical Part in Reducing Transportation Emissions*, Transportation Energy Institute, June 2023. Available at Decarbonizing Combustion Vehicles – A Critical Part in Reducing Transportation Emissions - Transportation Energy Institute.
[138] *Id*.
[139] 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-

larger impact in markets with more low carbon intensity electricity and greater electrical grid reliability.[140] Toyota announced that regional energy variation is the reason Toyota will provide a diversified range of carbon neutral options to meet the needs and circumstances in every country and region.[141] 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.[142]

Importantly, successful implementation of EPA's Proposed Rule depends on consumer choice as much as it depends on technological improvements. But there is evidence that premature embrace of ZEV may backfire if consumers grow frustrated with inadequate infrastructure. Consumer market demand will not, and cannot, increase to meet the Proposal's required supply. Charging capabilities 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 ZEVs subsequently went back to ICEVs based on frustration with convenience factors such as unavailability of charging.[143] As the study on discontinuance cited by EPA states, "[R]ange isn't correlated with discontinuance in PHEVs or ZEVs but satisfaction with and access to charging [is]."[144] 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 ZEV adoption rates as the ZEV market becomes more mainstream.[145] Finally, a survey of PHEV owners in California found that current PHEV would *not* purchase their PHEV without incentives, therefore EVs and PHEVs adoption may face more challenges over time.[146] Moreover, EPA ignores that current ZEV sales are linked to mandates that force increased prices of ICEVs to subsidize the mandated ZEV sales. Those mandates are under judicial review.

As discussed in more detail below, consumer market demand will not, and cannot, increase to meet the Proposal's required supply. Charging capabilities, which creates range anxiety, is a key apprehension for nearly half the U.S. consumer market. EVs have less range, both technically and practically. As noted by J.D. Power, "[T]he majority of EVs provide between

---

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.

[140] The North American Electric Reliability Corporation (NERC's) *2022 Long-Term Reliability Assessment* (Dec. 2022) projects reliability concerns for certain regional entities. A*vailable at* https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_LTRA_2022.pdf.

[141] 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.

[142] Id.

[143] Hardman, S., and Tal, 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*

[144] *Id*. at 26.

[145] *Id*.

[146] *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).

200 and 300 miles of range on a full charge."[147] 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 performance."[148] 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.[149]

Moreover, the time it takes to charge a ZEV compared to fueling an ICEV deters ZEV adoption.[150] Depending on the type of vehicle (ZEV v. PHEV) and charger (Level 1, Level 2, or Direct current fast charging equipment ("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.[151] 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.[152] 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.[153] These extended recharging times remain a barrier to EV adoption.[154]

Additional barriers to ZEV 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. EPA cannot ignore these real-world limitations.

EPA requests comment on their approach to determining charging time, as set forth in the DRIA, Chapter 4.[155] EPA's analysis is contingent on unsupported assumptions regarding (1) U.S. consumers' adoption of and ability to purchase more expensive ZEVs (see Sections IV.B.2 and IV.E.2.ii); (2) the type of ZEV purchased (used ZEVs or PHEVs compatible with slower charging units or new ZEVs that can use DCFC) (Section IV,B.2 addresses charging times); (3) the

---

[147] *See* Sebastian Blanco, *List of EVs Sorted by Range* (Sept. 1, 2022), www.jdpower.com/cars/shopping-guides/list-of-evs-sorted-by-range.
[148] Id.
[149] *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/.
[150] 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).
[151] U.S. Department of Transportation, *Charger type and speed.* Available at https://www.transportation.gov/rural/ev/toolkit/ev-basics/charging-speeds.
[152] 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).
[153] 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.
[154] Exro, Barriers to electric vehicle adoption in 2022. Available at Barriers to Electric Vehicle Adoption: The 4 Key Challenges (exro.com).
[155] 88 Fed. Reg. at 29,367.

availability of critical minerals and metals to expand the supply of reliable and renewable electricity (see Section I.B); and (4) the availability of reliable and affordable charging for all users (see Sections IV.B.4). Given the flaws in EPA's methodology that omits significant data sources and other factors and makes unsupported assumptions, EPA should revise its analysis concerning charging time and continue with promulgating a final rule for future emissions standards, that accounts for the reality of today's automotive market and not the public pronouncements of the automotive industry, a single state or group of states, or other unsupported estimates of future market growth.

3. EPA Fails to Adequately Assess the Availability of Electricity Generation, Distribution, and Transmission

Despite the potential for increased demands on domestic energy generation and generation capacity,[156] EPA offers little to no support that these demands will be sufficiently met. Similarly, EPA's DRIA offers scant analysis regarding the costs associated with meeting these increased infrastructure and energy generation/capacity needs beyond the flawed reliance on various legislative actions, such as the BIL and IRA.[157] Consequently, EPA is pushing a single technology at a pace that cannot be adopted within the time frame of its own proposal.[158]

Grid resiliency is at risk of further deterioration due to increasing power demand from electrification, not just in transportation. EPA overlooks this issue in another example of the agency's failure to address a major aspect of the Proposal. Notably absent from EPA's analysis is any demonstration that sufficient utilities and other infrastructure needed to support accelerated ZEV implementation will be available by MY27. Focusing solely on ZEV themselves, EPA has not adequately evaluated or grasped the time and resources required to permit, construct, and operate the necessary infrastructure to power these vehicles, while maintaining reliable and affordable electricity for all other power consumers. 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.[159]

Power generation using traditional fuels has an advantage in that capacity is located near demand centers. Except for nuclear, any low-carbon power generation capacity must be located at the energy source (e.g., where the wind blows, water flows, sun shines). Supplying low-carbon

---

[156] *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).

[157] See, e.g., Salma Elmallah et al., 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 (projecting that upgrades needed solely for the PG&E service area in Northern California, which serves 4.8 million electricity customers and is subject to aggressive targets for both EV adoption and electrification of residential space and water heating will add at least $1 billion and potentially $10 billion to PG&E's rate base).

[158] DRIA at 5-28.

[159] 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).

electricity to charge EVs also needs to resolve the transmission of that power to the demand center. Installation of transmission capacity in a timely manner is not guaranteed, or even likely. The Bureau of Land Management recently issued its record of decision for the SunZia Southwest Transmission Project more than 15 years after the project was proposed.[160] Once this incremental power is transmitted from supply location to a load center, there are potentially additional distribution constraints before the electrons reach charging stations and homes. Just to get a sense of the burden that charging will have on the electrical grid, One ZEV 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, requiring innumerable upgrades, such as replacement of nearly every distribution system transformer with a larger transformer, the costs of which are borne by all electric ratepayers. EV chargers typically used in a home (Level 2) can increase a home's peak load by 40 percent to 100 percent, which stress neighborhood transformers and compromise reliability.[161]

The intensity is further complicated in that the capacity factor (percentage of time a plant is likely to be available for generation) of thermal and photovoltaic solar (ranging from 7-32 percent) and wind (ranging from 23-46 percent) plants is so much lower than dispatchable (e.g., nuclear 93 percent) generation capacity.[162]

Therefore, it is not sufficient to evaluate total grid capacity; EPA must consider the ability of RTOs to supply power safely and reliably to all users during peak demand conditions and the impact of commercial charging on local grids, and work with other federal entities to ensure the growth in power demand stemming from an expanding ZEV fleet in the Proposed Rule can be safely and reliably supplied. Beyond the normal approximately four-year lead time for OEMs to make incremental changes to their production needed to meet emissions standard, the typical duration of an electricity transmission system capital project timeline is approximately ten years, meaning the additional electricity generation and distribution required by the Proposed Rule is unlikely to be available in the period covered by the Proposal. 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, it will take time for the grid to be upgraded quickly enough to overcome the constraints above.[163]

---

[160] 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/.

[161] Matt Egan, "Extreme heat means two-thirds of North America could suffer blackouts this summer," Jan 26, 2023 (two-thirds of North America is at risk of energy shortfalls this summer during periods of extreme demand caused by air conditioning use). *See also* Gilleran, Madeline & Bonnema, Eric & Woods, Jason & Mishra, Partha & Doebber, Ian & Hunter, Chad & Mitchell, Matt & Mann, Margaret. (2021). Impact of electric vehicle charging on the power demand of retail buildings. Advances in Applied Energy. 4 ("[A]n electric vehicle station has the potential to dwarf a big box building's power demand if behind the same meter, increasing monthly peak power demand at the site by over 250%. Cold-climate areas paired with rate structures incorporating high demand charges are most susceptible for significant changes to the annual electricity bill, with increases as high as 88%."). As discussed in Section IV.B.2, charging time will decrease dramatically with DCFC chargers, but the trade-off is they require vastly more electricity.

[162] ENERGY INFORMATION ADMINISTRATION "Electric Power Monthly" (June 27, 2023).

[163] Gracie Brown, et al., MCKINSEY AND COMPANY, "Upgrade the grid: Speed is of the essence in the energy transition" (Feb. 1, 2022) *available at* https://www.mckinsey.com/capabilities/operations/our-

Regardless of whether OEMs even *could* comply with the Proposed Rule, they would likely be left in a position where there is no consumer demand, and fleet turnover declines because the infrastructure necessary to support the new ZEVs is either at capacity or nonexistent. Indeed, at least one study to date has concluded that, upon ZEVs becoming the norm in California, it could push the total demand for electricity beyond the existing capacity of the state's grid—turning ZEVs into zero electricity vehicles.[164] Even more important, meeting the electricity demand will require construction of new power plants, or electricity purchases from neighboring states, which require increased transmission and distribution capabilities.[165] Or, in the short term, electricity may come from fossil-fuel fired generators, in which case it makes more sense to leave the ICE in the car rather than beside it.

EPA ignores these constraints, relying on the hope that a massive expansion of renewable electricity generation and the transmission grid will occur in time to service EVs produced during MY 2027-2032. The Agency's expectations are unrealistic. 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."[166] 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.[167] 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.[168] EPA's refusal to examine the costs associated with grid updates required by the rule is another example of the agency's biased evaluation, resulting in an arbitrary and capricious regulatory decision.

4. EPA ignores the lack of reliable ZEV charging

The Proposal's success is partially contingent on the availability of "equitable, affordable charging."[169] Currently, ZEV charging is most available in metropolitan areas, with less investment occurring outside urban areas.[170] EPA's evaluation of the sourcing of critical minerals and building a secure supply chain for ZEVs does not consider how challenging it will be to meet the demand for copper needed for electric infrastructure (e.g., charging stations and storage) to accommodate increased electrical demand.[171] The Proposed Rule fails to even consider that copper demand is

---

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.

[164] Beth Daley, THE CONVERSATION, "Switching to electric vehicles could save the US billions, but timing is everything" (Dec. 4, 2018), *available at* https://theconversation.com/switching-to-electric-vehicles-could-save-the-us-billions-but-timing-is-everything-106227.

[165] *Id*.

[166] Berkeley Lab, *Electricity Markets and Policy: Queued Up: Characteristics of Power Plants Seeking Transmission Interconnection*, https://emp.lbl.gov/queues (last visited June 9, 2023).

[167] *Id*.

[168] *Id*.

[169] Joann Muller, "The electric car revolution hinges on equitable, affordable charging," Axios, Feb. 8, 2023. Available at The electric vehicle revolution hinges on equitable, affordable charging (axios.com).

[170] 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.

[171] IEA Report 2022.

expected to rise by 53 percent when supply is expected to rise by only 16 percent by 2040.[172] Indeed, by 2030, the expected supply from existing mines and projects under construction is estimated to meet only 80 percent of copper needs by 2030[173]—not considering the anticipated increase in ZEV production anticipated by EPA's Proposed Rule. 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.

While a significant percentage of the charging installations deployed today are Level 2 EVSEs, dual charging installations to enable the flexibility of LD as well as MD and HDV charging will become increasingly important. DCFCs will enable broader market coverage, even for LDVs 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, we should not minimize the impact of supply chain shortages/strains on the cost of materials necessary for installing supporting charging infrastructure in the short time ahead to 2032.

The DRIA admits its charging simulations to estimate charging network size *excluded* medium- and heavy-duty vehicles, which are also subject to EPA's EV mandate.[174] While these commercial vehicles may spend most of their time charging at private depot stations, these are mobile, commercial vehicles that will need to use (and strain) the charging network. It is arbitrary and capricious for EPA to omit those vehicles from its simulations.

Moreover, 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.[175] 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.[176] This is a significant technological issue that calls into question the viability of the existing charging network as well as future deployments. 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.[177]

Demand charges can be punishing, and in some cases make or break the business case for transition from ICEVs to ZEVs, particularly for fleets and vehicles that require DCFC charging. Other considerations for high-reliability use cases should include provisional back-up power

---

[172] 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.

[173] IEA Report 2022.

[174] DRIA at 5-39, n. 107.

[175] Rempel, David and Cullen, Carleen and Bryan, Mary Matteson and Cezar, Gustavo Vianna, Reliability of Open Public Electric Vehicle Direct Current Fast Chargers. Available at SSRN: https://ssrn.com/abstract=4077554 or http://dx.doi.org/10.2139/ssrn.4077554

[176] J.D. Power. Press Release, "2022 U.S. Electric Vehicle Experience (EVX) Public Charging Study." *J.D. Power*, 17 Aug. 2022, www.jdpower.com/business/press-releases/2022-us-electric-vehicle-experience-evx-public-charging-study. Accessed 28 June 2023.

system considerations, which depend upon back-up generators or expensive stationary energy storage batteries. Absent comprehensive understanding of the dynamics between increased ZEV use and charging infrastructure needs, OEMs and consumers are vulnerable.

5. The Proposed Rule Incorrectly Assumes that a Secure Supply Chain Will Exist for ZEV Technologies.

a. The Proposed Rule Does Not Properly Account for the Reliance on Foreign Markets for Critical Minerals.

In the DRIA, EPA states "according to analyses by Department of Energy's Li-Bridge, no shortage of cathode active material or lithium chemical supply is seen globally through 2035 under current projections of global demand." But there are many sources that contradict this point. Looking forward toward 2030, based on current and anticipated global production plans, a global supply shortfall is likely to begin toward end of the decade if planned mining and brine projects do not deliver as expected. Some critical minerals could face shortages as early as next year.[178] The options for mitigating supply chain risks are increasingly limited. At current production rates, the world exhausts the minable reserves of copper, cobalt, and nickel in the 2030s. This timeline accelerates significantly with the greater production needed for EPA's envisioned energy transition. EPA's cherrypicked data on mineral availability is another example of EPA's failure to address a major aspect of the proposal, in this case obscuring real world obstacles to the Proposed Rule.

b. The Proposed Rule Over-Estimates the Ability for the U.S. to Source Materials and Fabricate Batteries Domestically.

The Proposed Rule fails to fully account for the challenges associated with creating and sustaining a viable domestic supply chain that can deliver production-ready batteries necessary to meet the Rule's assumed pace of electrification. Notably, the Rule does not carefully consider the impediments to a viable domestic supply chain because of mineral availability, mineral processing and manufacturing, and overall costs (see Section I.A.1 and Figures 2, 3, and 4).

EPA's DRIA severely overestimates both the availability of minerals and mining/processing infrastructure and capabilities in the U.S., assuming PEV production will not be dependent on foreign manufacture of battery cells.[179] In 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. [180] Given the Agency's lack of expertise in this area, it is not surprising EPA neglects to properly analyze mineral availability and mining processing capabilities.

---

[178] Lilly Lee, ENERGY INTELLIGENCE, *Mining the Gap to a Net-Zero Future* (May 15, 2023) *available at* https://www.energyintel.com/00000188-1e5f-d806-ad9f-5edfeb1d0000?utm_campaign=website&utm_source=sendgrid.com&utm_medium=email.
[179] DRIA at 3-20.
[180] *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-cobalt-mine/article_efd97f32-d015-11ed-9424-bfb28220210c.html.

Though EPA mentions that OEMs are taking steps to secure domestically sourced minerals and related commodities to supply production for these plants, the OEM's recent comments express grave concern regarding the availability of critical minerals needed to produce batteries,[181] Moreover, many of those offtake agreements referred to EPA are with projects yet to be permitted, built, or commercialized at scale.[182] 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. ZEVs are projected to represent approximately 90 percent of lithium demand by 2030, so, contrary to the assumption in the DRIA, switching chemistries for other uses will not reduce the burden or price on lithium.

EPA suggests that improvements in recycling rates and enhancing recovery technologies at mines will reduce the need to develop new critical mineral sources. But this statement is misplaced. Recycling technologies for EV batteries remain nascent and cannot scale at a rate fast enough to alleviate supply shortages in the timeframe of the Proposed Rule. Moreover, even if those technologies develop at a faster than expected pace and commercial scale facilities are constructed, there will not be enough batteries to recycle to make the slightest dent in the quantity of critical minerals needed to build out EPA's projected battery demand (see Section I.A.1 for discussion of lack of critical minerals for batteries).

Considering the above, the Proposed Rule creates a multi-year—and perhaps insurmountable—dependence on foreign mineral production and this, coupled with domestic limitations in battery manufacturing capabilities, will make it impossible to sustain the viable domestic supply chain that EPA envisions. While EPA acknowledges that "much of the supply chain supporting the manufacture of ZEVs is located outside of the U.S.,"[183] it arbitrarily underplays this dependency by claiming that "more than half of battery cells and 84 percent of assembled packs in PEVs sold in the U.S. from 2010 to 2021 were produced in the U.S." Battery cell production, however, is just a piece of the value chain, and it cannot grow absent a stable supply of refined critical minerals and precursors. Even assuming critical minerals are available, a viable supply chain requires sufficient capacity of midstream refining operations prior to battery cell production. Such capacity does not exist. For instance, BMI foresees a 77 percent deficit in domestic available cathode active material to meet 2035 demands in North America (N.A.). And this estimate was done *prior* to the EPA Proposal.

While Congress and the Administration have taken steps to accelerate the supply chain, their efforts are insufficient to fully support the rate of production required by the Proposal. 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. Currently, Chinese battery firms are the most advanced and the majority of raw material mining and processing goes through Chinese entities. See Section I.A. and Figure 2. Thus, it will be difficult for many OEMs to meet the requirements for IRA credits in the near term.

---

[181] AAI Comments at iv-v.
[182] *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-cobalt-mine/article_efd97f32-d015-11ed-9424-bfb28220210c.html (describing Jervois's decision 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.)
[183] DRIA at 3-20.

Without a domestic solution to this value chain, reliance on imports will only add to cost to the battery pack.[184]

Ignoring these potential supply chain shortfalls leads to further deficiencies in EPA's analysis. Indeed, limited supplies and constrained supply chains risk production downtime and inventory backlogs—and this is just for production of the ZEVs.[185] 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."[186] 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)."[187] Daimler, of course, is not alone in these conclusions and yet EPA's Proposed Rule appears to reject outright any realistic assessment of future supply chains.

6. EPA failed to consider, let alone evaluate, alternative emissions reductions strategies

Despite all the well-known constraints with mandating electrification of the transportation sector and building the necessary nationwide infrastructure, EPA never considered, let alone evaluated, emissions reductions from modifications to ICEVs' emissions control systems, bio and renewable fuels, alternative fuels (e.g., hydrogen), and use of carbon capture and sequestration. 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.[188]

According to the Energy Information Agency's June 2023 Short-Term Energy Outlook (STEO),

- Biomass diesel (which includes biodiesel and renewable diesel) production averaged 3.1 billion gallons in 2022. EIA expects production to average 4.0 billion gallons in 2023 and 4.8 billion gallons in 2024.

---

[184] Benchmark Minerals Intelligence, BMI (*see* Chart 2, 3 & 4).
[185] *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).
[186] *Id.*
[187] *Id*.
[188] 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

- Ethanol and renewable oxygenate production is expected to increase from 18.4 billion gallons in 2022 to 19.2 billion gallons in 2023, and to 20.4 billion gallons in 2024.
- Biodiesel production averaged 1.6 billion gallons in 2022. Production is expected to decline to 1.5 billion gallons in 2023, and to 1.4 billion gallons in 2024.
- Renewable diesel production averaged 1.5 billion gallons in 2022. Production is projected to increase to 2.4 billion gallons in 2023, and to 3.4 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 reduce GHG emissions such as:

- Taking advantage of Congress' 45Q tax credit for CCS, ethanol producers are looking to used carbon capture and sequestration to reduce GHG emissions from the 15 billion gallons of ethanol blended into our nation's gasoline.[189]
- 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.[190]

Although the RFS, an EPA program, has achieved significant emissions reductions for more than a decade, there is no mention in the Proposal or the DRIA of alternative emissions standards that could be achieved through the use of additional changes to emissions control equipment, alternative fuels, or bio and renewable fuels. Lifecycle assessments (LCAs) of GHG emissions from ICEVs reveal that 73 percent of lifecycle GHG emissions come from fuel combustion.[191] By comparison, lifecycle emissions from ZEVs occur not from fuel combustion from the vehicle, but from fuel use and various energy and material inputs upstream from the vehicle. Therefore, EPA's failure to consider standards that reduce 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 from new motor vehicles which "cause, or contribute to, air pollution" as envisioned in CAA section 202(a) and demonstrates its unvarnished bias in favor of EVs. The Agency's refusal to evaluate biofuels illustrates EPA's tunnel vision that proposes a single panacea for a highly complex problem in a rapidly changing world.

Finally, EPA also ignored the advances being made in carbon capture and sequestration (CCS) as an alternative means of reducing GHG emissions. While EPA touts available incentives for ZEVs in federal legislation, it overlooks federal incentives and private sector support for CCS technology. Many AFPM members are investing heavily in CCS technology to

---

[189] 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). Retrieved at https://ethanolproducer.com/articles/19655/carbon-america-to-develop-ccs-project-at-nebraska-ethanol-plant.

[190] 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

[191] Decarbonizing Combustion Vehicles – A Critical Part in Reducing Transportation Emissions - Transportation Energy Institute.

reduce their GHG emissions.[192] This promising technology has the potential to decrease emissions. EPA arbitrarily ignored the promise of this technology.

D. EPA Cannot Adequately Substantiate the Need for Regulatory Action

EPA has not demonstrated a compelling need to accelerate emissions reductions within the time frame for which MY27–32 vehicles/engines are already being designed. EPA points primarily to the emissions associated with motor vehicles, presumably tailpipe emissions, but provides no information supporting the need for such an accelerated schedule beyond what is currently known. Rather, EPA makes conclusory assertions that the "need for regulatory action" is supported by the BIL and the IRA, which "together provide further support for a government-wide approach to reducing emissions by providing significant funding and support for air pollution and GHG reductions across the economy, including specifically, for the component technology and infrastructure for the manufacture, sales, and use of electric vehicles."[193] EPA notes that under the current standards, ZEV demand is doubling each year, from 2.2 percent of U.S. light-duty vehicle production in MY 2020, to 4.4 percent in MY 2021 and projected to reach 8.4 percent in MY 2022.[194] Congressional spending on EV charging or vehicle subsidies does not confer new authority on EPA to mandate EVs. For example, within the IRA, Congress merely appropriated additional funds "[i]n addition to amounts otherwise available" to the EPA for certain fiscal years to carry out various activities[195] and Congress did not amend or refer to section 202 of the Clean Air Act or any of the provisions of that Act on which EPA bases its proposed rule.[196] Thus, EPA's reliance on these enactments to justify and underwrite proposed standards' feasibility is arbitrary and capricious.

As discussed above, because EPA may only prescribe standards applicable to vehicles that "cause or contribute" to air pollution, its standards cannot account for ZEVs with no tailpipe emissions. However, if EPA is authorized to promulgate such standards, those standards must account for any upstream emissions from upstream electric generating units, the mining of battery materials, and the production of the vehicle.[197] Without consideration of upstream and full life-cycle impacts (e.g., frequent battery replacements), EPA has failed to inform the public of the comparative costs of emission reductions, whether from ZEVs, ICEVs, energy efficiency, or other sectors. EPA's continued failure to address this "major aspect of the problem" is another example of EPA moving toward its predetermined outcome—the forced electrification of U.S. transportation.[198] AFPM has continually put EPA on notice of the need to include a LCA to avoid

---

[192] AFPM members ExxonMobil, Chevron, Valero, and INEOS have been at the forefront of CCS. ExxonMobil invested in CCS for more than 30 years and maintains an equity stake in roughly one-fifth of all carbon capture projects worldwide. These projects "captured approximately 40 percent of all the captured anthropogenic carbon dioxide (CO2) in the world." Exxon's current carbon capture capacity of about nine million metric tons annually is the equivalent of planting 150 million trees every year.

[193] Proposed Rule at 29,187.

[194] Proposed Rule at 29,189.

[195] *See, e.g.*, sections 60106-60111 of the Inflation Reduction Act

[196] In contrast, section 60107 references in the title to that section funding "for Section 211(o) of the Clean Air Act."

[197] Proposed Rule at 29,353–55.

[198] *See, e.g.,* Comments of the American Fuel & Petrochemical Manufacturers on EPA's Reconsideration of a Previous Withdrawal of a Waiver of Preemption 10 (July 6, 2021), https://www.regulations.gov/comment/EPA-HQ-OAR-2021-0257-0139, Comments of the American Fuel &

an arbitrary comparison—the agency continues to ignore this issue of central relevance to EPA's benefit analysis.

For instance, the fuel source of a PEV, like a ZEV—a battery composed of carbon intensive minerals and the electricity generated to power the battery—produces emissions. The fact that emissions occur 100 percent upstream of the vehicle's operation and therefore fall outside of the tailpipe emissions calculation does not make these emissions any less significant. There is no logical basis for this omission because, as EPA is aware, concerns about GHG emissions relate to their longer-term global concentrations. Consequently, air pollutant emissions are an important consideration regardless of where such emissions occur. Without comparing lifecycle ZEV emissions to lifecycle emissions from ICEVs, EPA cannot know if or how much its standards are decreasing total emissions. Thus, while EPA is not required to solve all emissions problems in one rulemaking, EPA cannot claim to be solving part of the problem here without addressing upstream and downstream emissions. EPA's approach of mandating ZEVs cannot possibly be reasonable if it is merely shifting emissions from one source to another at the cost of hundreds of billions of dollars—trillions when costs to upgrade EV infrastructure are factored in—or could do so more cost-effectively by choosing a different approach.[199]

The flaw in EPA's approach is illustrated by the fact that emissions standards easily become meaningless by changing the engine's location. The proposed rule would treat a ZEV charged by a diesel-powered generator as if it had zero tailpipe emissions, notwithstanding the fact that it remains "powered" by a diesel engine located outside the vehicle. A LDV directly powered by a diesel engine inside the vehicle, however, is credited with the emissions produced by that engine. EPA's inconsistent approach begs the question of how nascent technologies such as a vehicle propelled by compressed air would be evaluated. Thus, the energy source of the "fuel" matters and EPA arbitrarily ignores lifecycle emissions from ZEVs and also proposes to *remove* requirements for upstream emissions calculations.[200] EPA admits "the program has now been in place for a decade, since MY 2012, with no upstream accounting and has functioned as intended, encouraging the continued development and introduction of electric vehicle technology."[201] EPA's mandate is to establish feasible standards rooted in the statute, not to ignore real-world emissions to "encourage" the development of its favored technology. EPA requested comment on whether it should account for upstream emissions for all fuel and vehicles. If technologies are being treated equally, as they must, the answer is an unequivocal yes.

EPA compounds this flaw by making unsupported assumptions regarding the total emissions impacts of its Proposal. While it claims that the overall analysis for combined

---

Petrochemical Manufacturers on EPA's/NHTSA's Proposed The Safe Affordable Fuel-Efficient Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks 68-73 (Aug. 24, 2018), https://www.regulations.gov/comment/EPA-HQ-OAR-2018-0283-5698; Comments of the American Fuel & Petrochemical Manufacturers on EPA's California State Motor Vehicle Pollution Control Standards; Advanced Clean Trucks; Zero Emission Airport Shuttle; Zero Emission Power Train Certification; Request for Waiver of Preemption 7-12 (Aug. 2, 2022), https://www.regulations.gov/comment/EPA-HQ-OAR-2022-0331-0088.

[199] 5 U.S.C. § 706(2)(A); *cf.* Antonin Scalia, "Regulatory Review and Management," Regulation Magazine 19 (Jan./Feb. 1982) ("Is it conceivable that a rule would not be arbitrary or capricious if it concluded with a statement to the effect that 'we are taking the foregoing action despite the fact that it probably does more harm than good, and even though there are other less onerous means of achieving precisely the same desirable results'?").

[200] 88 Fed. Reg. at 29,197.

[201] *Id.* at 29,253.

downstream and upstream emissions "likely underestimates the net emissions reductions that may result" from the Proposed Rule, EPA fails to offer a data-based substantiation. The Proposed Rule failed to assess emissions from battery manufacturing or electricity production. EPA acknowledges that its standards will increase the demand for electricity and that demand will simultaneously increase emissions from the electric generating sector, but by making the unsupported assumption that low carbon electricity will be readily available, it makes no real attempt to quantify those emissions or compare them to alternative options for reducing emissions from this sector. EPA must provide a more comprehensive analysis to comply with its directive under the Clean Air Act and better assess the resulting impact of the Proposed Rule.

E. EPA's cost benefit analysis is impermissibly inadequate

Section 202(a) of the Clean Air Act does not mandate that EPA set standards to drive pollutant emissions down to zero. Rather, CAA section 202(a)(1) only requires that standards be promulgated for air pollutants which "may reasonably be anticipated to endanger public health or welfare." And in promulgating regulations, EPA must balance benefits to health and welfare against the time necessary to allow for the development and application of the requisite technology as well as costs of compliance.[202] With regard to heavy duty vehicles or engines, including the MDVs subject to the Proposed Rule, EPA standards are to reflect "the greatest degree of emission reduction achievable through the application of technology which the [EPA] determines will be available" during the relevant model year.[203] Rather than update ICEV standards, the Proposed Rule unlawfully forces a transition from ICEVs to ZEVs in the MY27–32 timeframe without properly evaluating all cost-effective means to address policy objectives and the time necessary for the development and application of requisite technology. EPA has not demonstrated that such a transition is feasible, let alone necessary.

1. EPA overstates the environmental benefits

EPA touts several emissions benefits in the Proposed Rule from shifting the light-duty vehicle fleet to ZEVs. But EPA's analysis is lopsided in favor of its preferred technology. In analyzing environmental costs and benefits, EPA overlooks negative environmental consequences of ZEVs from increased power generation, vehicle usage, ZEV tire wear, the EV manufacturing supply chain, and battery replacements and disposal at the end of their useful life. Notably, EPA fails to assess net emissions. Although EPA modeled changes to power generation anticipated by the Proposed Rule as part of its upstream analysis, EPA does not consider the potential degradation of air quality in areas in the direct vicinity of existing or new power plants.[204]

EPA assumes the power sector is expected to shift over time to using significantly more wind/solar generation and electricity storage (i.e., batteries), but ignores the environmental impacts of the overall increase in critical minerals demand for electrical grid storage and how that compounds the stress on critical minerals for the ZEVs themselves. But the expansion of electrical grids—even ignoring the Proposed Rule's increased demand—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, as described above, higher prices could have a major

---

[202] 42 U.S.C. § 7521(a)(2).
[203] 42 U.S.C. § 7521(a)(3)(A)(i).
[204] *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").

impact on future grid investments and EV costs.[205] 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.

As previously mentioned, EPA did not fully consider the impact of the rule on fleet turnover. The Agency is aware that the higher purchase price of new ZEVs will keep older cars and trucks on the road longer and that new ZEVs will increase particulate matter ("PM") emissions through increased tire and road wear. In another example of EPA's biased analysis, EPA estimated the value of health benefits from reductions in $PM_{2.5}$ emissions by multiplying $PM_{2.5}$-related benefit-per-ton ("BPT") values by the annual reduction in tons of directly emitted $PM_{2.5}$ and $PM_{2.5}$ precursor emissions (NOx and SO2) from displaced ICEVs.[206] However, EPA ignored the fleet turnover benefit that would result from replacing older ICEVs with new, more efficient, ICEVs. EPA also ignored its own National Emissions Inventory, which shows that roadway dust contributes more $PM_{2.5}$ 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 $PM_{2.5}$ emissions.[207] Converting ICEs to ZEVs under the Proposal would significantly increase the average vehicle weight on U.S. roadways, which in turn would increase the entrained road dust emissions. Yet EPA did not include these PM sources or increases in the analysis. There also exist overall medium-duty truck weight restrictions, which could require a greater number of ZEVs to move the same tonnage of cargo, thus increasing the number of vehicles needed to haul the same amount of freight, vehicle miles traveled, and resulting PM emissions. EPA also ignores the GHG emissions associated with manufacturing more, less dense, remotely located intermittent generation sources and battery back-up, plus the need for more natural gas peaking capacity and massive transmission, substation, and transformer investment to integrate these technologies into the power grid. Those emissions are significant and may offset or eliminate the benefits that EPA calculates.

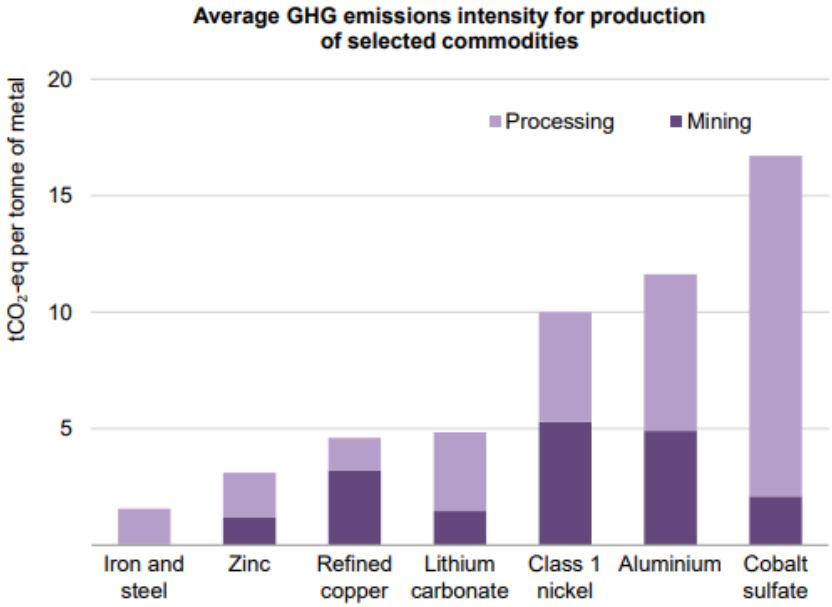
The mining sector will also need to grow significantly to meet ZEV demand as anticipated, and required, by the Proposed Rule. Mining is an energy- and environmental resource-intensive activity. Critical minerals for electric batteries such as lithium and copper are particularly vulnerable to water stress given their high-water usage.[208] 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 ZEV technology penetration rate required under the EPA's proposal poses significant challenges for

[205] IEA Report 2022.
[206] DRIA at 7-36.
[207] EPA, "2020 National Emissions Inventory (NEI) Data," *available at* https://www.epa.gov/air-emissions-inventories/2020-national-emissions-inventory-nei-data.
[208] *See* EIA 2022 Report.

the timely and widespread implementation of best practices to be developed, implemented, and ensure oversight mechanisms are working.[209]

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 8**, mining and processing several minerals and metals used for ZEV production are carbon intensive.

Figure 8: [210]



Source: INTERNATIONAL ENERGY ADMINISTRATION

The process for extracting and processing critical minerals can be responsible for approximately 20 percent of the lifecycle GHG emissions from battery production.[211] EPA failed to weigh any of these consequences appropriately in the Proposed Rule.

EPA's Proposal unreasonably relies on comparing ICEV's and ZEV's performance based on EPA's own 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 EPA's estimates of potential environmental benefits. EPA has cherry-picked the data underlying its analysis to boost the estimated environmental benefits from EVs compared to ICEVs by a significant percentage. EPA's proposal is based on performance data estimates of ICEV fuel economy using EPA's "5-cycle method", i.e., Federal Test Procedure-75

[209] 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/.
[210] IEA Report 2022 at 17.
[211] 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.

("FTP") at regular and cold temperatures, Highway Fuel Economy Test ("HWFET") and High-Speed Driving (US06) and Use of Air Conditioning (SC03). EPA's proposal is also based on performance data estimates of ZEV fuel economy that (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). *See* AFPM Comments on the Department of Energy Petroleum-Equivalent Fuel Economy Calculation and Petition for Rulemaking, 88 Fed. Reg. 21525 (April 11, 2023) (Attachment 3)

These discrepancies are unreasonable and arbitrary. If EPA'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 impacts. EPA must account for these differences and environmental impacts.

Another critical aspect of the Proposed Rule not comprehensively considered is that recycling of the battery and related electrical components of ZEVs is in a state of infancy and poses unique materials handling and safety challenges. EPA should consider the environmental profiles of both ZEVs and ICEVs in light of the production, operation, and disposal of the vehicle (its useful life). 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 EPA in the Proposed Rule:

- Battery packs could contribute 250,000 metric tons of waste to landfills for every 1 million retired ZEVs.[212]
- 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."[213]
- 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.[214]
- 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.

---

[212] 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-gas/wells-toconsumer/fuels-and-refining/fuels/vehicle-technology-studies.
[213] 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.
[214] IEA Report 2022.

- 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.[215]

- 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.[216]

- 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.[217] 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.[218]

- 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.[219]

- 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.[220]

- Whether sufficient recycling capacity can be permitted and constructed to facilitate the Proposal.

EPA must, therefore, conduct a full LCA to compare all environmental impacts to reasonably conclude that the Proposal will decrease environmental impacts rather than merely shift them.

2. The Proposal's costs are vastly understated

EPA estimates that the Proposed Rule will cost $26 billion dollars but will produce between $200–$220 billion in net discounted benefits.[221] EPA's conclusion is built on a shaky foundation of understated and hidden costs that when properly accounted for reveal that the costs of the Proposed Rule far exceed its benefits.

---

[215] 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-production-scrap-to-be-main-source-of-recyclable-material-this-decade.
[216] Id.
[217] 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
[218] IEA Report 2022.
[219] Benchmark Minerals Intelligence, *supra* at n. 105.
[220] Letter from Carolyn Hoskinson, Director, EPA Office of Resource Conservation and Recovery, "Lithium Battery Recycling Regulatory Status and Frequently Asked Questions," (May 24, 2023).
[221] Proposed Rule at 29,361-62.

EPA assumes that significant ZEV sales would occur in the absence of the Proposed Rule but fails to acknowledge that the aggressive level of OEM investments are being bade in direct response to anticipated increases in fuel economy requirements.[222], EPA excludes the vehicle costs associated with these ambitious automaker commitments that are linked to EPA standards. This is improper. In conducting the cost-benefit analysis EPA estimates that the rule will result in a 67 percent ZEV penetration rate and incorporates the emissions reductions associated with each of these vehicles. EPA cannot include the benefits of these ZEVs and exclude their costs.

While we have not had sufficient time to fully analyze EPA's cost analyses, we have been able to identify several significant deficiencies, each of which understates the true costs of the Proposal: (1) EPA significantly understated the costs of batteries required by the rule; (2) EPA understated the costs of ZEVs by focusing only on their purchase price and ignoring the impacts of manufacturers' emissions trading and cross-subsidization strategies; (3) EPA's analysis of operating costs and other costs of ownership is incomplete; and (4) EPA misstates the costs of EVSEs and completely ignores the costs of grid upgrades that will be necessitated under the Proposed Rule. We discuss each of these deficiencies below.

i. Battery costs

We start with a discussion of EPA's analysis of battery costs because it has significant impacts on ZEV production, operating, and disposal costs. EPA "substantially underestimates the costs of batteries,"[223] providing an inadequate analysis and ignoring the cost and long-term affordability of battery production. In the DRIA, EPA states that "despite recent short-term fluctuations in price, the price of lithium is expected to stabilize at or near its historical levels by the mid- to late-2020s, suggesting that the elevated battery costs being reported today will not persist."[224]

This analysis misses the mark. Between January 2021 and March 2022, the cost of lithium increased by 738 percent.[225] 2022 battery costs were $153 per kWh,[226] and cost reduction curves have already begun to flatten out. Indeed, battery costs rose 7 percent in 2022. With EPA's and other developing nations' push to electrify transportation and the concomitant need to deploy utility-scale batteries, the demand for lithium (and other critical minerals) is expected to grow exponentially. Even so, EPA assumes declining battery costs will reach $120 per kWh in 2032.[227]

---

[222] ALLIANCE FOR AUTOMOTIVE INNOVATION "Auto Innovators Statement on Final EPA GHG Rule" (December 20,2021 available at *https://www.autosinnovate.org/posts/press-release/statement-final-epa-ghg-rule*
[223] AAI Comments at iv.
[224] DRIA at 2-51.
[225] *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.
[226] Dept. of Energy, "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.
[227] DRIA at 2-46 (resulting 75kWh battery).

EPA's reliance on an ICCT study to justify its estimate of falling battery costs is misplaced. ICCT ignored literature that PHEVs depreciate with certain models and makes losing greater value than others, like Tesla, especially those with long-range features. A May 2023 CBS article highlighted a statement from Kelley Blue Book, an automotive research company, that PHEVs generally depreciate faster than ICEVs.[228] Kelley Blue Book said that three-year-old PEVs hold 63 percent of their value compared to 66 percent for ICEVs.[229] Additionally, ICCT's battery cost curve does not account for the potential of rising PEV-related metal prices which can cause the price of battery packs to increase, as seen in 2022 and 2023. If ICCT's estimates of PEV battery pack costs were revised to be higher, PEVs are likely to be priced at a substantial premium compared to ICEVs.

While prices have since declined, price volatility should be expected to continue. Despite these very public findings, EPA asserts that "battery costs have continued to decline."[230] EPA points to the IRA as a mechanism to reduce battery prices, yet this law simply extended the existing battery subsidy and even limited its applicability through domestic sourcing and income requirements. Thus, EPA is relying on an existing program for the proposition that it will lower battery prices in the future. EPA is simultaneously ignoring that the increase in demand for batteries will raise their price.

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 because 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 in the near term. For example, most lithium contracts are written as long-term agreements, which are based on Fastmarkets' lithium index and a discount, and sometimes with a floor/ceiling mechanism to hedge against pricing volatility.

Ultimately, the volatility of material pricing will directly affect whether certain battery projects even materialize. And if they do, OEMs will need to increase their prices to ensure a steady supply. Morgan Stanley estimates ZEV makers will need to increase prices by 25 percent to account for rising battery prices.[231] EPA must consider these data and correct this aspect of its cost-benefit analysis.

Moreover, the minerals used for EV batteries are also essential to many components of a lower-carbon energy system beyond EV 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-

---

[228] Joe D'Allegro, What to know about buying a used electric vehicle as more hit the auto sales market, CNBC (May 21, 2023), https://www.cnbc.com/2023/05/21/what-to-know-about-buying-a-used-ev-as-more-hit-the-car-market.html. See also AAA Survey Shows EV Owners Should Be Concerned About Depreciation (insideevs.com).

[229] Id.

[230] Proposed Rule at 29,188.

[231] 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.

conductors, medical applications, and even bank notes. Without substantial increases in new mining capacity (or massive shifts toward recycling), competition for these minerals will materially stiffen with increased electrification and the shift in 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. By contrast, the U.S. is much less reliant on foreign sources of petroleum energy sources. In fact, the U.S. has been a net exporter of gasoline and diesel since late 2009. And much of our petroleum imports come from friendly countries such as Canada.

EPA's proposal may impose additional costs of economic risk to individuals and small business owners who will be asked to depend on increasingly expensive infrastructure necessary to provide on-the-go fuel.[232] Durable and reliable EVs are therefore critical to ensuring that projected emissions reductions are achieved by this proposed program and costs of ownership are properly presented. EPA further states that it is proposing new battery durability requirements for light-duty and medium-duty ZEVs and PHEVs but this doesn't alter EPA's concession that it is relying on other programs, like California's, to implement battery durability and a suite of other customer assurance provisions to ensure customer demand.[233] EPA should consider inclusion of durability requirements in this proposal as 150 miles of range for singular battery life and 24,000-mile range of use (or two years) are well below the period of use for a comparable ICEV with a full tank of fuel and will impact consumers as there is not enough data with these technologies.

ii. EV Purchase Price

EPA assumes in MY 2032, there will be a $3500-$6100 price gap between EVs and ICEVs, with ICEVs costing less.[234] EPA's purchase price incorrectly assumes that every ZEV will be eligible for the maximum federal purchase incentive.[235] EPA asserts the relatively slight increase in the incremental cost of manufacturing a rule-compliant vehicle (Table 13-46 of the DRIA provides an average increase of $1,164 by 2032) is based, in part, on the assumption battery manufacturers are eligible for the IRA's ten percent Production Tax Credit for modules manufactured in the U.S. It is arbitrary and capricious for EPA to ignore the likelihood that battery raw materials will not be mined in the U.S. or available for import from credit-qualifying countries, given Section I.A.1 of these comments illustrates China's dominance in processing critical minerals needed for ZEV batteries and the manufacture of ZEV batteries. Consequently, it is unrealistic for the Agency to assume ZEV purchases will be eligible for the full incentive.

EPA's Proposal fails to evaluate how government credits are embedded in vehicle pricing. For example, neither federal or state governments, or 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 price. There is increasing evidence that regulations which mandate EV 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.[236] Cox Automotive found that "in

[232] 88 Fed. Reg. 4,296 (Jan. 24, 2023) (EPA Final Rule re Control of Air Pollution from New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards).
[233] Proposed Rule at 29,284.
[234] DRIA at 4-20, Table 4-77
[235] AAI Comments at ii-iv.
[236] 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

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 and in December 2022, they offered 90.[237] This is unacceptable. EPA and its sister agencies cannot create credits and then claim they do not affect vehicle price solely because they have not sought to quantify them.

Tellingly, EPA never estimates the annual price of a comparable ZEV and ICEV, for each year in which EPA proposes standards. EPA's bias towards EVs is demonstrated by EPA's statement that its OMEGA modeling "now incorporates a consumer choice element. This means that the impacts of, for example, a $40,000 BEV versus a $35,000 ICE vehicle of similar utility (i.e., a 14 percent increase for the BEV) is a much different consideration than a $6,000 incremental BEV cost versus a $1,000 incremental ICE cost (a 500 percent increase for the BEV)."[238] In other words, EPA set up its model to show the consumer ***price*** (not the actual real-world cost) of EVs have a lower percentage cost increase than the incremental absolute ***cost*** of switching from ICEVs to ZEVs.

Moreover, although the incremental vehicle manufacturing cost in EPA's High Battery Cost sensitivity is higher (Table 13-140 of the DRIA provides an average increase of $1,547 by 2032 for medium duty vehicles) than the Proposed Rule, EPA does not quantify how much of the increase in incremental cost is due to battery raw material prices. Finally, as part of its ZEV cost assessment EPA relies on data as old as 2017 but does not appear to account for the inflation of cost components in recent years. EPA should make it clear how it is accounting for not just typical inflation to normalize dollars in a similar year, but also the significant changes in supply chains in recent years that have led to significantly higher costs for ZEV parts and materials compared to older data points that EPA references.

EPA also assumes the increased supply of ZEVs—resulting from OEMs' planned production expansions and offering of more ZEV models, charging infrastructure, purchase incentives, and lower battery prices—will lead to lower ZEV prices.[239] EPA ignores that battery prices have begun to rise due to limited supply of minerals.[240] While there are some affordable EVs, these EVs typically have a range below 200 miles on a full charge.[241] If consumers want longer range EVs, they will pay a considerable purchase price as seven of the top ten, range-

---

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/Bradbury-Prepared-Statement-for-17-May-2023-Oversight-Hearing.pdf

[237] *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-automakers-have-all-but-abandoned-the-budget-market-a68862f0 (last visited May 24, 2023).

[238] *See* RIA page 2-42, https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P10175J2.pdf.

[239] DRIA at 4-23.

[240] BLOOMBERGNEF "Lithium-ion Battery Pack Prices Rise for First Time to an average of $151/kWh" (Dec. 6, 2022) *available at* https://about.bnef.com/blog/lithium-ion-battery-pack-prices-rise-for-first-time-to-an-average-of-151-kwh/

[241] *See* Sebastian Blanco, *List of EVs Sorted by Range* (Sept. 1, 2022), www.jdpower.com/cars/shopping-guides/list-of-evs-sorted-by-range.

rated EVs cost anywhere from $74,800 to $110,295.[242] EPA's analysis also fails to account for the increased vehicle sales tax and property tax associated with the higher purchase price of ZEVs (even after myriad subsidy programs).

EPA's cost benefit analysis is implicitly built around much longer battery life than is currently achieved, as EPA does not factor in battery replacement costs or the environmental implications of additional battery production, recycling, and disposal. EPA cannot have it both ways – either the batteries are remarkably durable, or the costs of this Proposed Rule are dramatically understated. Even with massive direct and indirect subsidies, EVs 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.[243] The price disparity has not improved, with the average price of light-duty EVs near $66,000 in August 2022 and continuing to rise.[244]

iii. EPA Must Consider Automobile Manufacturer Cross-Subsidies in Determining the Costs of the Proposal

While the purchase price differential between comparable ICEVs and ZEVs 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.[245] Additionally, the Proposed Rule will force manufacturers to sell an increasing percentage of ZEVs each year that goes far beyond the consumer demand for the product at its true cost. To ensure compliance with the ZEV mandate under the Proposal, 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, ZEV mandates would fail.

---

[242] *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/.

[243] 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.

[244] Andrew J. Hawkins, EV prices are going in the wrong direction (The Verge Aug. 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).

[245] *See* PCMag, Profit vs. the Planet, (Sept. 26, 2022), Profit vs. the Planet: Here's Why US Automakers Are All-In on Electric Vehicles | 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.").

While opaque, the magnitude of ZEV cross-subsidies is significant.[246] Ford's decision to report EV financial information separately beginning in 2023 provides an additional glimpse into the magnitude of cross-subsidization. Ford lost approximately $58,000 for each ZEV car it sold during the quarter.[247] This reported per-vehicle loss is more than an order of magnitude greater than EPA's estimates of the price differential between the two technologies. While cross-subsidization, tax credits, emissions trading, and other EV subsidies may hide the true costs of a ZEV mandate from consumers, EPA has a duty to quantify and present those costs that are attributable to the Proposed Rule. Pursuant to Executive order 12866:

> EPA is to "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.[248]

Ignoring actual ZEV production costs, including credit trading costs, is arbitrary and capricious.

EPA ignores this real-world regulatory compliance pricing scheme. EPA should quantify and explain this issue of central relevance to the Proposed Rule even if it may undermine the Administration's stated goal of electrifying the transportation fleet. As noted above, E.O. 12866 requires EPA 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 CAA section 202(a), which requires "appropriate consideration to the cost of compliance." EPA has instead understated the costs of this Proposal.

Astonishingly, EPA makes no attempt to account for these real-world costs, nor to communicate to the public that, as the Proposal mandates a higher percentage of ZEV sales, the cross-subsidies must be paid for by a shrinking number of ICEV buyers and, therefore, must

---

[246] EPA'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-powell-altfuels_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/cafe_pic/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 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.

[247] *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).

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

significantly increase the average price of EVs. As EV prices rise, their sales and ICEV fleet turnover will slow, reducing environmental benefits and creating a significant drag on the economy.

iv. Total cost of ownership

EPA's proposal also vastly underestimates the cost of ownership for ZEV owners by assuming ZEVs achieve real-world fuel economy that is equivalent to EPA's test methods. They do not and it is not close. This error significantly undermines EPA's estimates of costs for both ZEV owners and associated power infrastructure and charging infrastructure requirements. As noted in the environmental benefits discussion above, EPA's proposal is based on performance data estimates of ICEV fuel economy using EPA's "5-cycle method." If EPA'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 ZEV owner costs for electricity and ZEV maintenance and battery replacement. EPA must account for these real costs.

EPA's total cost of EV ownership incorrectly assumes each vehicle type of all new ICEV and ZEV will travel the same miles each year.[249] EVs have less range, 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."[250] Studies show that the average electric car is driven 9,059 miles per year, compared with 12,758 miles for ICEVs.[251] By overestimating VMT, EPA compounds all other errors in its assumptions that all work in favor of ZEVs and to the detriment of ICEVs.

Another way that EPA justifies lower EV ownership costs is by failing to fully account for current state excise tax policies and insurance that establish higher costs for ICEV owners and lower costs for ZEV owners. Insurance premiums for PEVs are typically higher than comparable ICEVs because of higher repair and parts cost. 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.[252] 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.[253]

Should EPA mandate that most new vehicles will be ZEVs, it will become increasingly untenable for ICEV owners to either further subsidize ZEV owners by paying higher excise taxes, or for states to suffer a shortfall in revenue collections by continuing to give preferential treatment to ZEV owners. EPA must acknowledge these significant costs necessarily must increase for ZEV owners as EPA mandates higher ZEV sales.

Finally, EPA's total cost of ownership analysis assumes dramatically lower retail fuel costs for ZEVs (around 60 percent less) than liquid fuels.[254] Real-world data squarely contradicts EPA's

---

[249] DRIA at 4-20, Table 4-7 (e.g., EPA assumes EV and ICEV sedans/wagons will both travel 15,700 miles per year).
[250] *See* Sebastian Blanco, *List of EVs Sorted by Range* (Sept. 1, 2022), www.jdpower.com/cars/shopping-guides/list-of-evs-sorted-by-range.
[251] iSeeCars, *The Most and Least Driven Electric Cars* (May 22, 2023), https://www.iseecars.com/most-driven-evs-study.
[252] How Much Does Electric Car Insurance Cost? - ValuePenguin.
[253] Electric Cars vs Gas Cars Cost in Each State | Self Financial.
[254] DRIA at 4-20, Table 4-7.

cost assumptions on EV charging. 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 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.[255] This is astonishing given that gasoline prices in California are the second highest in the nation, averaging approximately $4.01 per gallon of gasoline in 2021. 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 New England are finding it is costing more to charge up than fill up, paying $0.28 per kilowatt hour (double the price of the national average) in the fall of 2022.[256] EPA must revise its analysis to account for realistic electricity prices.

Finally, charging pricing has been unpredictable, with some stations charging by the minute instead of charging for electricity consumed.[257] 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.[258] 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.[259]

v. Costs to upgrade electricity generation, transmission, and distribution

For EPA to achieve its GHG reduction aspirations in this Proposed Rule, all three of these challenges must be met: (1) sufficient materials to manufacture the required EVs, chargers, and grid upgrades, (2) consumer willingness to substitute ZEVs for ICEVs currently for sale, and (3) a low-carbon power generation grid capable of reliably supplying energy for this mode of transportation. Combined with other issues, such as a disorderly transformation of the generation base as conventional units are replaced with intermittent resources, raises questions of the grid's ability to reliably meet consumer demand on a regional basis. Despite these challenges, EPA incredibly assumes no increase in the cost of electricity to consumers (whether EV owners or others) associated with the proposed rulemaking. EPA underestimates the cost of electricity to all

---

[255] 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#page=117.

[256] Irina Ivanova, https://www.cbsnews.com/moneywatch?ftag=CNM-16-10abg0dFor some electric vehicle owners, recharging now more costly than filling up, CBS News Money Watch, Feb. 13, 2023. Available at Electric cars 2023: In some parts of the U.S., recharging now more costly than filling up - CBS News.

[257] 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/electric-vehicle-charger-pricing.

[258] *Id*.

[259] Id.

consumers, including EV owners, and omits the cost of grid upgrades and distributed energy resources have been excluded from these estimates.[260]

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.[261] 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 IOP 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.[262] 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. We agree with and support the Proposed Rule's acknowledgement that "a recent study found power needs as low as 200 kW could trigger a requirement to install a distribution transformer."[263] Other anecdotal evidence discussed within an RMI report highlights the expensive mistakes that can emerge from insufficient planning and engagement in details.[264]

EPA incorrectly assumes that ZEV owners will pay the national average residential electricity price to charge their vehicles. EPA fails to consider that the majority of ZEVs in the U.S. are located in utility service territories with some of the highest electricity rates in the country and that the average EV owner currently pays a much higher price to charge their ZEV 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 electricity. For example, California, which has roughly 40 percent of all registered ZEVs in the U.S., has a residential electricity rate that is roughly double the national average. Considering that EPA is modeling its rule after a California-like approach to mandate ZEVs, it would be more appropriate for EPA to assume similar real-world costs (at a minimum, given California's temperate climate). Moreover, EPA fails to consider that mandating such a high ZEV sales rate will necessarily require exponential increases in commercial ZEV charging at rates that are currently three, four or five times 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. Instead, EPA uses a residential rate for electricity and does not consider peak power or time of use charges. 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 9**.

---

[260] U.S. Department of Energy, National Renewable Energy Laboratory, "The 2030 National Charging Network: Estimating U.S. Light-Duty Demand for Electric Vehicle Charging Infrastructure." June 2023. https://driveelectric.gov/files/2030-charging-network.pdf.

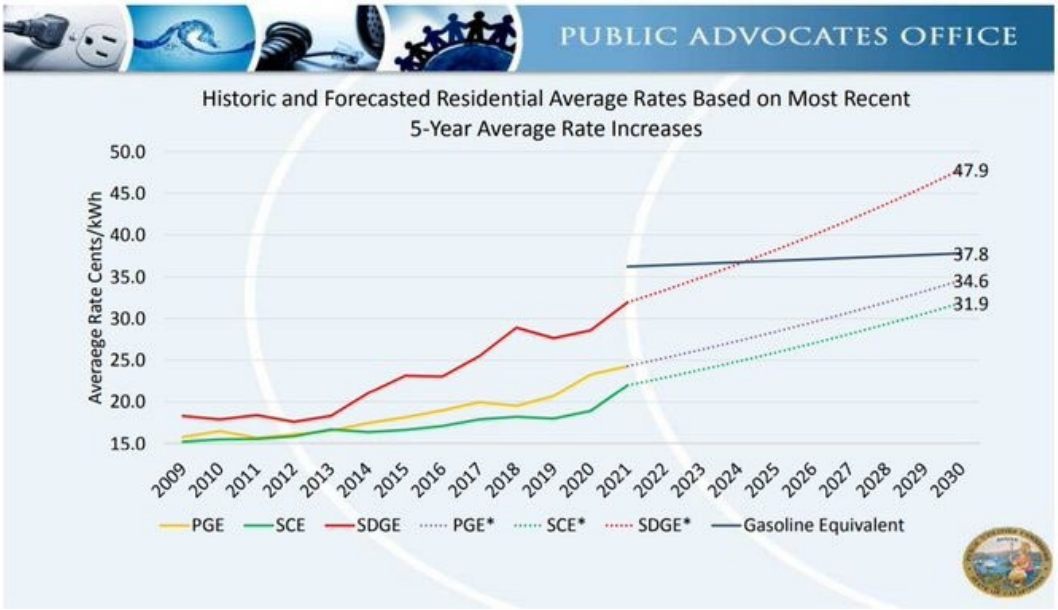
[261] Dan Shreve and Wade Schauer, *Deep decarbonization requires deep pockets* (June 2019), https://www.decarbonisation.think.woodmac.com/.

[262] 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.

[263] DRIA at 5-35.

[264] Alessandra R. Carreon, et al., RMI, "Increasing Equitable EV Access and Charging" (2022) *available at* https://rmi.org/insight/increasing-equitable-ev-access-charging/.

Figure 9:



Source: Michael Shellenberger, Twitter (citing California Public Advocate's Office data), *April 27, 2021*).

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.[265]

EPA must revise its analysis to account for realistic electricity prices. The proposed ZEV mandate will require an enormous investment in power generation and distribution, resulting in nationwide increases in electricity bills that EPA has not considered. Of course, considering the additional trillions of dollars in costs would paint a clear picture that the costs of forced electrification far exceed even the inflated benefits EPA presented in the Proposed Rule.

vi. Charging infrastructure costs

EPA vastly underestimates the cost to build the required charging infrastructure. Even as new ZEVs are ready to enter into production, auto industry representatives have acknowledged the necessary infrastructure for electric vehicles continues to lag.[266] 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.[267] In 2022, 51 percent of all new chargers were added in *2 percent* of U.S. counties, with California adding

[265] 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.org/2021/08/equity-transition-electric-vehicles/ (accessed June 29, 2023).
[266] ALLIANCE FOR AUTOMOTIVE INNOVATION, "Get Connected Electric Vehicle Quarterly Report" (Fourth Quarter 2022).
[267] ALLIANCE FOR AUTOMOTIVE INNOVATION, "Get Connected Electric Vehicle Quarterly Report" (Fourth Quarter 2022).

25 percent of the 2022 new charging capacity and 160 counties adding only one charger.[268] 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.[269]

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.[270] 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.[271] There is lower investment into charging systems outside of major metro markets.[272] 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.[273]

EPA also did not include any cost of power distribution upgrade needed for EVSE installation, citing large uncertainty. While uncertainty may exist, EPA cannot assume there is no cost associated with this required upgrade. 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:
>
> o $22–$72 billion for privately accessible Level 1 and Level 2 charging ports

---

[268] Id.
[269] Id.
[270] 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.
[271] 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).
[272] 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-charging-infrastructure-america-needs.
[273] 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).

o $27–$44 billion for publicly accessible fast charging ports

o $5–$11 billion for publicly accessible Level 2 charging ports.[274]

Clearly, these cost estimates are vastly higher than the $7 billion in costs that EPA claims is needed over an even longer time frame. Given a general linear relationship between ZEV charging infrastructure costs and the number of registered ZEVs, it is reasonable to estimate (using the DOE numbers) a cost adder for charging infrastructure to each ZEV of (at least) $1,606 to $3,848. These costs are not shown by EPA and EPA's failure to account for them is arbitrary and unreasonable. Moreover, note that DOE's estimate excludes "the cost of grid upgrades and distributed energy resources."[275]

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 ZEVs by 2030—in line with federal targets—McKinsey estimates that America would require 1.2 million public EV chargers and 28 million private EV chargers by that year.[276] All told, the country would need almost 20 times more chargers than it has now."[277] EPA must address charger investment and reliability by more than just referencing EV subsidies in recent legislation.

However, building more charging stations is not enough. "Electricity purchased at a public charger can *cost five to ten times more than electricity at a private one*."[278] Lower-income consumers cannot afford to install solar photovoltaics, which proponents claim will allow ZEVs to be charged at home with emissions-free electricity.[279] Those who cannot afford private charging will end up paying vastly more for a re-charge than the wealthy. 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.

vii. Costs to maintain road infrastructure

EPA fails to account for infrastructure impacts from increased operation of heavier ZEVs on the road including road and bridge deterioration and commensurate reduced funding for infrastructure from fuel tax collections. These excluded costs are known to EPA and must be included in EPA's analysis—another example of EPA's failure to address a major aspect of the proposal.

EPA must, therefore, conduct a full cost analysis to compare *all* costs that must be incurred in order to achieve the environmental benefits EPA is claiming in the Proposal. EPA cannot

---

[274] National Renewable Energy Laboratory, *The 2030 National Charging Network: Estimating U.S. Light-Duty Demand for Electric Vehicle Charging Infrastructure*, June 26, 2023, at vii. Available at https://www.nrel.gov/docs/fy23osti/85654.pdf.
[275] Id.
[276] McKinsey, "Building the Electric Vehicle Charging Infrastructure America Needs," (Apr. 18, 2022), *available at* America's electric-vehicle charging infrastructure | McKinsey; *see also* S&P Global, "EV Chargers: How Many Chargers DO We Need?, (Jan. 9, 2023) (millions of chargers are needed).
[277] *Id*.
[278] *Id*.
[279] 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.

rationally claim an environmental benefit from its Proposal without also accounting for all the costs needed to bring about those environmental benefits.

V. 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 reduce the carbon intensity of, and criteria emissions from, the transportation sector. Unfortunately, the concurrent comment periods for this rule and EPA's proposed heavy-duty vehicle GHG emissions standards are insufficient to provide fully informed comments on either proposal.

Although AFPM was one of several entities requesting that EPA extend the comment period for both rules, the agency declined, claiming that its pre-publication release of material meant that the public in fact had 83 days to comment on the Proposed Rule and 66 days to comment on the heavy-duty GHG rule.[280] Contemporaneously with these proposals were two related rules addressing electric vehicles: (1) DOE published a proposal to revise its regulations regarding calculating a value for the petroleum-equivalent fuel economy of EVs for use in determining compliance with the CAFE program;[281] and (2) the IRS proposed regulations regarding the IRA's New Clean Vehicle Credit. The table below illustrates that in the span of 88 days (April 11 – July 5), interested parties were required to analyze 531 pages of proposed rules in the Federal Register and more than 30,000 pages of supporting material to understand the basis for each proposed rule. The page estimate excludes the voluminous amount of data supporting EPA's two proposed vehicle rules.

[280] June 2, 2023, letter from Joseph Goffman, EPA Principal Deputy Assistant Administrator, responding to Patrick Kelly, AFPM; *see also* letters from Alliance for Automotive Innovation, National Automobile Dealers Association, Hyundai-Kia America Technical Center, Inc., Hyundai Motor America, and National Center for Public Policy Research, *available at* https://www.epa.gov/regulations-emissions-vehicles-and-engines/proposed-rule-multi-pollutant-emissions-standards-model.
[281] 88 Fed Reg. 21,525, 21,526 (Apr. 11, 2023).

Proposed Rule	No. of Federal Register Pages	Publication Date	Comments Due	Comment Period (including pre-publication days)	Estimated Pages of Supporting Documents
Petroleum-Equivalent Fuel Economy Calculation	15	April 11, 2023	June 12, 2023	61 days	More than 500
Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles—Phase 3 ("HDV Rule")	236	April 27, 2023	June 16, 2023	66 days	More than 20,000
Proposed Rule (Light-Duty Vehicles—Multi-Pollutant) ("LD/MD Rule")	263	May 5, 2023	July 5, 2023	83 days	More than 10,000
30D New Clean Vehicle Credit	17	April 17, 2023	June 16, 2023	60 days	~30

EPA's refusal to grant additional time to respond to the Proposal and the heavy-duty GHG rule 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.[282]

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." Even counting the handful of additional days afforded by EPA's pre-publication release of the preambles, this period is not sufficient to adequately address the sweeping scope of EPA's proposals to force electrification of the nation's transportation fleet. Considerable time is required simply to read and respond to the sheer volume of material covered in each rulemaking docket, particularly given EPA's evident lack of rigor and discipline in its citation and characterization of underlying sources. As illustrated in these comments, our review identified numerous instances in which examination of sources cited by EPA as support for its conclusions indicated that characterization of these sources is inaccurate, incomplete, or misleading. Thus, to meaningfully respond to EPA's proposal, the public must fact-check EPA's

[282] Around the same time AFPM's extension request was denied, EPA saw fit to grant an extension of time to submit comments on the "Commercial Sterilization Facilities NESHAP." *See* EPA Docket EPA-HQ-OAR-2019-0178-0154.

work. There are 1,040 footnotes in the text of the HDV rule preamble and 908 in the LD/MDV rule. Assuming it takes an average of one hour to identify, locate or acquire and read the underlying reference work cited, and draft a meaningful comment in response, that equates to 130 eight-hour workdays that would be required just to fact-check the HD rule (65 days if one assumes this work takes only half an hour per cite on average). For the LD/MDV rule, which would equate to 113.5 eight-hour workdays (or 57 based on assuming 30 minutes per citation). This analysis does not include the time required to verify sources cited in the DRIAs, much less the 1,420 supporting and related materials posted to the HDV docket and the 429 posted to the LD/MDV docket.

Further, the short and concurrently running comment periods on these closely related rules are exacerbated by EPA's unduly narrow identification of industries affected by this rule. Under the heading "Does this action apply to me," EPA limits its identification of affected industries to entities with direct compliance obligations: motor vehicle manufacturers, commercial importers of vehicles and vehicle components, alternative fuel vehicle convertors, and medium duty engine & vehicle manufacturers.[283] Although EPA notes that "this table is not intended to be exhaustive…other types of entities could also be affected," EPA 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.

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, EPA has unreasonably constrained the number and types of entities that will find out about these proposed actions in time to comment. EPA appears to be counting on closing the comment period before consumers, retailers, farmers, fleet operators, bio and renewable fuel producers, small businesses, emergency response providers, local governments, or any of the host of other interests who will be affected by the profound changes in how light and medium duty vehicles are sold or even realize what is at stake. This sort of gamesmanship is at odds with EPA's responsibility under the Administrative Procedures Act and the Due Process clause of the U.S. Constitution.

VI. EPA's Consideration of Fuel Controls

EPA requested comment on potential changes to fuel controls to address PM emissions in the existing fleet. EPA specifically stated that it "has not undertaken sufficient analysis to propose changes to fuel requirements under CAA section 211(c) in this rulemaking and considers such changes beyond the scope of this rulemaking."[284] Since EPA has declared it is not actually proposing to change fuel controls in this Proposal, AFPM respectfully asserts that it cannot provide detailed comments on this issue at this time; however, we are more than willing to work with the Agency on this issue.

As noted above, AFPM sought a brief extension to the comment period, which EPA denied.[285] AFPM does not have adequate time to thoroughly review and comprehend EPA's supporting materials, conduct additional research into the unrealistic assumptions and conclusions embedded in the Proposed Rule, and provide informed comment on each aspect of a rule that has significant implications for our industry and the nation while also reviewing, researching, and providing comments on potential changes to fuel controls.

---

[283] Proposed Rule at 29,184.
[284] Proposed Rule at 29,397.
[285] See Section V.

That said, at an extremely high level, we would have significant concerns about the adverse impacts this would have on the supply of gasoline and the minuscule PM benefits that might be achieved. For example, EPA's assessment must include the significant impacts to refineries and the gasoline pool such potential measures would entail. The potential fuel controls measures would cut a significant amount of the gasoline pool that is not contributing to PM generation. This would translate into both economical and logistical impacts (*e.g.*, alternate disposition, or blending into diesel pool) that impacts costs to consumers. EPA should consider the significant contribution to PM from tire wear and entrained road dust, which account for a majority of the total $PM_{2.5}$ emissions associated with traffic.[286] EPA also must revise its flawed methodologies. For instance, the ASTM D7096 simulated distillation by gas chromatography (SimDis) proposed to either calculate PMI or to set high boiling point limits is not adequately precise to use as a control method and would generate significant errors. We also question the Agency's legal authority to move forward with these fuel controls, which have no environmental benefit for new motor vehicles.

Please contact the undersigned to explore these issues in greater detail. AFPM is happy to bring its members' technical expertise to this complex issue to help inform EPA's decision-making in this area.

* * *

In sum, AFPM urges EPA to rescind the Proposed Rule where EPA has no Congressional authority to redefine the automotive sector by mandating electrification under the guise of more stringent emissions standards. At the very least, EPA should reconsider the Proposed Rule considering these comments and the significant challenges facing electrification that were left unanalyzed and severely underestimated by EPA. We thank you for your consideration of these comments and are available for future discussion should you have questions.

Sincerely,

Leslie Bellas

Leslie Bellas
Vice President
Regulatory Affairs
American Fuel & Petrochemical
Manufacturers

[286] *See* https://www.epa.gov/air-emissions-inventories.