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U.S. Environmental Protection Agency
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Washington, DC 20460

Environmental Protection Agency (EPA), Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles, Docket ID No EPA-HQ-OAR-2022-08295, 88 Fed. Reg. 29184 (May 5, 2023)

To Whom It May Concern:

Pursuant to the Environmental Protection Agency's (EPA*)* proposed *Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles*, 88 Fed. Reg. 29184 (May 5, 2023*),* Tesla, Inc. (Tesla) submits the following comments in response to the agency's proposal. Tesla further notes that it is a member of the Zero Emission Transportation Association (ZETA) and incorporates by reference the comments submitted by the organization.[1]

Given the acceleration of public health and welfare impacts associated with climate change, it is incumbent upon the EPA to recognize the crucial role battery electric vehicle (BEV) technology plays today and how widespread commercial availability of BEVs in the U.S. today should inform the implementation of a more stringent finalized standard as part of this rulemaking. In designing new standards that increasingly depend upon achieving reductions of tailpipe conventional criteria pollutant emissions and ever-enhanced efficiency to reduce greenhouse gas emissions, it is fully appropriate for the agency to recognize that while the industry may be nearing the limits of incumbent internal combustion technologies -- or those additional gains may occur at ever greater costs per gram of pollutant reduction -- alternative technologies are increasingly available with competitive cost and performance capabilities. As provided below, the rapid pace of light-duty vehicle electrification strongly supports efforts to address the significant public health and community impacts of air pollution associated with the current light-duty vehicle fleet. This transformative technology has been amply demonstrated, is being rapidly deployed, and has significantly decreasing competitive costs. Tesla believes it is essential for EPA to establish stringent longer-term light-duty multi-pollutant emission standards that actively embrace a more rapid transition to BEVs. Such standards are well within EPA's long-standing and well-established authority and are compelled by the record before the agency. Accordingly, Tesla encourages the agency to finalize multi-pollutant light-duty standards that are more stringent than the preferred proposed emission reduction standards.

[1] Zero Emission Transportation Association (ZETA) is the first industry-backed coalition of its kind advocating for 100% of vehicles sold by 2030 to be electric vehicles (EVs). Achieving this goal will create hundreds of thousands of new jobs, secure American global EV manufacturing leadership, dramatically improve public health, and significantly reduce carbon pollution; See https://www.zeta2030.org/

For the reasons described herein, Tesla supports the proposed Alternative 1 with added stringency so that the final performance standards achieves a fleet BEV penetration rate greater than 69% in MY 2032.[2] Alternative 1 is estimated to provide greater CO2 emissions reduction of -51% from no action by 2050 compared to -46% under EPA's proposal, and the additional stringency will result in even greater emission reductions.[3] Accordingly, Tesla asserts the EPA should amend its proposal with a more stringent version of Alternative 1 and take, *inter alia*, the following additional steps to increase the performance and overall stringency of the proposed standards:

- Eliminate off-cycle crediting for all types of vehicles;
- Revisit the plug-in hybrid electric vehicle (PHEV) utility factor to accurately reflect real world emissions;
- Amend the proposal to create parity in promoting motor vehicle air conditioning (MVAC) efficiency adoption;
- Maintain the existing zero emissions upstream approach for BEVs;
- Eliminate credit multipliers for all vehicles; *and*
- Ensure BEVs continue to be accounted for, and participate in, the NMOG + NOx reduction standard.

Tesla also supports increasing the stringency of standards through MY 2035 in a manner that is consistent with the 100% ZEV sales achieved in California's Advanced Clean Car II (ACC II).[4] However, recognizing that there are some uncertainties within the marketplace, in the final rule EPA should clearly denote that such an extension for MY 2033-35 is intended to be severable from the rest of the proposal and provide a rationale for this severability.[5]

Tesla's proposed changes will significantly reduce emissions, result in increased deployment of the best available emissions reduction technology - BEVs[6] - consistent with the emissions reduction technology requirements of the Clean Air Act standard setting mandate under section 202, and ensure the Administration is meeting it statutory mandate to protect the public health and welfare. Foundationally, the primary dynamics that have driven progress in the development of EPA's program in the past and its fundamental architecture remain and, if anything, have become even clearer and more imperative, including: the ongoing need to achieve significant additional emissions reductions from the motor vehicle sector, including for conventional pollutants and greenhouse gases; the increasingly capable role of advanced vehicle technologies, led by zero-emissions BEVs, in providing those reductions; the benefits to the automotive industry of achieving a uniform national program integrating California-led and Federal authorities and operating seamlessly across EPA, the Department of Transportation (DOT), and state authorities; and the importance of regulatory stability to the industry -- and of standards of sufficiently long duration -- to foster the significant investment needed to cement this transformation to advanced technology vehicles. The continuation and amplification of these trends provide a sound legal basis for an even more stringent set of standards than EPA's current proposal.

I. Introduction

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[2] See, 88 Fed. Reg. 29332-33, Table 96.
[3] Id., at 29348 (comparing Tables 135 and 136).
[4] 88 Fed. Reg. at 29239; See also, California Air Resources Board (CARB), Advanced Clean Cars II Regulations: All New Passenger Vehicles Sold in California to be Zero Emissions by 2035 *available at* https://ww2.arb.ca.gov/our-work/programs/advanced-clean-cars-program/advanced-clean-cars-ii
[5] See generally, Administrative Conference of the U.S., Severability in Agency Rulemaking (June 29, 2018) *available at* https://www.acus.gov/recommendation/severability-agency-rulemaking
[6] See, 40 C.F.R. §1037.150(f) (*Electric vehicles.* Tailpipe emissions of regulated pollutants from electric vehicles . . . are deemed to be zero.).

Tesla's mission is to accelerate the world's transition to sustainable energy. Moreover, Tesla believes the world will not be able to solve the climate change crisis without directly reducing air pollutant emissions - including carbon dioxide and other greenhouse gases - from the transportation and power sectors.[7]

To accomplish its mission, Tesla designs, develops, manufactures, and sells high-performance fully electric vehicles and energy generation and storage systems, installs, and maintains such systems, and sells solar electricity.[8] Consistent with this effort, recently, Tesla was ranked as the world leader in the transition to vehicle electrification.[9]

Tesla currently produces and sells four fully electric, zero emissions light-duty vehicles (ZEVs): the Model S sedan, the Model X sport utility vehicle (SUV), the Model 3 mid-sized sedan, and the Model Y mid-sized SUV. As an EV-only manufacturer, as the EPA recognized in its *2022 Automotive Trends Report*, Tesla had by far the lowest carbon dioxide emissions (0 g/mi) and highest fuel economy (124 miles per gallon equivalent) of all large vehicle manufacturers in MY 2021.[10] Additionally, in December 2022, Tesla initiated delivery of its Tesla Semi Class 8, day cab truck[11] and will start commercial production of its Cybertruck[12] (medium-duty passenger pickup truck) later in 2023.

Tesla is also deeply committed to ensuring the U.S. remains a leader in advanced manufacturing. All Tesla vehicles sold in U.S. are manufactured in the U.S. In 2023, the Tesla Model Y ranked as the most American-made car, based on overall contributions to the U.S. economy, the Model 3 ranked just below as the second most American made car on the market, and Model X and Model S followed as numbers three and four respectively.[13] The National Highway Traffic Safety Administration (NHTSA) similarly confirms that 100% of the vehicle, engine, and transmission assembly in each Tesla vehicle sold in the U.S. occurs in the U.S.[14] In addition, Tesla's U.S.

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[7] See, Tesla, Master Plan Part 3 (Apr. 5, 2023) *available at* https://www.tesla.com/ns_videos/Tesla-Master-Plan-Part-3.pdfhttps://www.tesla.com/ns_videos/Tesla-Master-Plan-Part-3.pdf

[8] See, Tesla, Impact Report 2022 (Apr. 24, 2023) *available at* https://www.tesla.com/ns_videos/2022-tesla-impact-report-highlights.pdf

[9] See, ICCT, The Global Automaker Rating 2022: Who Is Leading the Transition to Electric Vehicles? (May 31, 2023) *available at* https://theicct.org/publication/the-global-automaker-rating-2022-may23/

[10] EPA, The 2022 EPA Automotive Trends Report, Greenhouse Gas Emissions, Fuel Economy, and Technology Since 1975 (Dec. 2022) at 10, 13 *available at* https://www.epa.gov/automotive-trends/download-automotive-trends-report#Full%20Report

[11] See, Tesla, Tesla Semi Delivery Event (Dec. 1, 2022) *available at* https://livestream.tesla.com/https://livestream.tesla.com/; See generally, Tesla, Semi: The Future of Trucking *available at* https://www.tesla.com/semihttps://www.tesla.com/semi

[12] Tesla, Cybertruck, *available at* https://www.tesla.com/cybertruckhttps://www.tesla.com/cybertruck

[13] Cars.com, 2023 Cars.com American-Made Index: Which Cars Are the Most American? (June 21, 2023) *available at* https://www.cars.com/articles/2023-cars-com-american-made-index-which-cars-are-the-most-american-467465/; See also, Cars.com, Cars.com's American-Made Index Adds Tesla to Exclusive List of Multiyear Chart-Toppers, Model Y Nabs No. 1 (June 21, 2022) *available at* https://www.cars.com/articles/cars-coms-american-made-index-adds-tesla-to-exclusive-list-of-multiyear-chart-toppers-model-y-nabs-no-1-451081/; Cars.com, Tesla Model 3 Snags No. 1 Spot on Cars.com's 2021 American-Made Index®; First All-Electric Vehicle to Top the List in Its 16-Year History (June 23, 2021) *available at* https://www.multivu.com/players/English/8915151-cars-com-tesla-model-3-2021-american-made-index/; American University, Kogod School of Business, 2021 Made in America Index (Oct. 15, 2021) (Finding in 2021, each of Tesla's vehicles - the Model S, 3, X and Y - ranked in the top 10 and Tesla was the only manufacturers to have representation from its entire portfolio in the top 10.) *available at* https://kogod.american.edu/autoindex/2021

[14] NHTSA, Technical Support Document: Proposed Rulemaking for Model Years 2024-2026 Light Duty Vehicle Corporate Average Fuel Economy Standards (Aug. 2021) at 96, Table 2-6 *available at* https://www.nhtsa.gov/sites/nhtsa.gov/files/2021-08/CAFE-NHTSA-2127-AM34-TSD-Complete-web.pdf

supply chain continues to expand and spans across more than 40 states, including Alabama, Georgia, Ohio, Indiana, and Michigan.[15]

In the U.S., Tesla conducts vehicle manufacturing and assembly operations of vehicles, its advanced 4680 lithium-ion battery cells, and battery packs at its factories in Fremont, CA. [16] It also produces Megapack, a utility-scale grid storage battery, at its factory in Lathrop, CA. [17] In 2021, Tesla's investment in California helped deliver $10.4 billion ($28.5 million per day) to California's gross state product.[18]

At Gigafactory Texas in Austin, TX, Tesla produces the Model Y crossover, and will produce Cybertruck (starting in 2023) and manufacture Tesla's new, advanced 4680 lithium-ion battery cell, cathode, and battery packs. Upon completion, Gigafactory Texas will invest over $10B in factory development and create at least 10,000 new jobs.[19]

In Sparks, NV at Gigafactory Nevada, Tesla produces its Class 8 truck, the Semi, electric drive trains and manufactures advanced battery packs and energy storage products. Since 2014, a total of $17.1 billion in economic output has been generated as a result of the Gigafactory's operations.[20] On January 2023, Tesla announced a $3.6B expansion of the facility in large part to scale manufacturing of the Semi.[21]

At Gigafactory New York in Buffalo NY, Tesla produces its DC-fast charging (DCFC) equipment for the Tesla Supercharger network, solar energy products, power electronics and supports Tesla autonomous vehicle program. Tesla also manufactures its 750-kW Semi charger in Buffalo. To date, Tesla's cumulative investment and spend in New York State has reached over $1.3B.[22]

Tesla also manufacturers, builds, and services highly automated, high-volume manufacturing machinery at its facility in Brooklyn Park, MN,[23] and operates a tool and die facility in Grand Rapids, MI.[24]

Collectively, Tesla's U.S. facilities support over 70,000 employees and are responsible for billions of dollars of U.S. investment and economic activity each year. See *Figure 1: Tesla Global Delivery Volume and Job Growth* (showing Tesla's rapid growth in worldwide vehicle delivery and employment levels from 2012-2022).

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[15] See e.g., AutoNews, Suppliers Starting to Set Stage for Tesla in Texas (Sept. 6, 2021) *available at* https://www.autonews.com/suppliers/tesla-suppliers-starting-set-stage-texas-gigafactory

[16] See, Inside EVs, Tesla 4680 Cell Production Ramping Quickly, Won't Impact Cybertruck (Oct. 20, 2022) *available at* https://insideevs.com/news/617588/tesla-4680-cell-ramp-wont-impact-cybertruck-other-models/

[17] Tesla, Megapack *available at* https://www.tesla.com/en_eu/megapackhttps://www.tesla.com/en_eu/megapack

[18] IHS Markit, The Economic Contributions of Tesla to the California Economy, 2018–2021 (October 2022) (detailing Tesla's positive economic impact in California) *available at* https://www.tesla.com/blog/teslas-california-footprint

[19] See e.g., Austin-American Statesmen, Elon Musk says hiring for Tesla's Austin factory could hit 10,000 workers, (March 31, 2021) *available at* https://www.statesman.com/story/business/2021/03/31/elon-musk-says-teslas-austin-site-hire-ten-thousand-2022/4826859001/; See also, Reuters, Musk says Tesla's Texas factory is $10 bln investment over time (Dec. 15, 2021) *available at* https://www.reuters.com/technology/musk-says-teslas-texas-factory-is-10-bln-investment-over-time-2021-12-16/

[20] See, Governor of Nevada's Office of Economic Development, Tesla, New Application Pursuant to Senate Bill No. 1 (2014 Special Session) (March 2, 2023) at 4 *available at* https://goed.nv.gov/wp-content/uploads/2023/02/3-A.-Tesla-Inc.-Board-Packet-PG-1-19.pdf

[21] Reuters, Tesla plans $3.6 bln Nevada expansion to make Semi truck, battery cells (Jan. 25, 2023) *available at* https://www.reuters.com/markets/deals/tesla-invest-over-36-bln-nevada-build-two-new-factories-2023-01-24/#:~:text=Jan%2024%20(Reuters)%20%2D%20Tesla,its%20new%204680%20battery%20cell.

[22] Tesla, Riverbend Report Annual Report to Empire State Development (Feb. 1, 2023); See also, Buffalo Business First, Tesla workforce grew 16% since end of 2021 in Buffalo (Feb. 8, 2023) *available at* https://www.bizjournals.com/buffalo/news/2023/02/08/tesla-reports-job-growth-in-buffalo.html

[23] See, Tesla, Perbix *available at* https://www.tesla.com/perbixhttps://www.tesla.com/perbix

[24] See, Tesla, Manufacturing: Build a Sustainable Future *available at* https://www.tesla.com/manufacturing

Importantly, Tesla is not only a manufacturer but is also continuing to grow its large network of retail stores, vehicle service centers, and electric vehicle charging stations to accelerate and support the widespread adoption of electric vehicles.[25] Tesla operates the country's largest and most reliable public EV charging network. Since 2012, Tesla has invested heavily in siting, building, and operating charging infrastructure. In 2013, Tesla had just eight Supercharger Stations in North America. Today, Tesla owns and operates the largest DCFC network in the world, known as the Tesla Supercharging network.[26]

The Tesla Supercharger network reliably serves quick charging needs to BEV drivers on road trips with limited time to charge, and without access to charging at home or at the workplace.[27] As of April 2023, there are more than 4,900 Supercharger locations globally and more than 45,000 Supercharger stalls. In the U.S., there are approximately 2,000 Supercharger locations and more than 21,000 Supercharger stalls capable of charge rates up to 250 kW. Superchargers are located in all fifty States, the District of Columbia, and Puerto Rico, representing approximately 60% of the DCFC plugs operational today in the U.S. In February 2023, in conjunction with the White House, Tesla announced it will open at least 3,500 Superchargers in the U.S. to non-Tesla vehicles.[28] Further, recently Ford announced it will be adopting the North America Charging Standard (NACS) and will partner with Tesla to allow Ford vehicles – including BEV like Mach-E and the F-150 Lightning – to utilize the Tesla Supercharger network.[29] Similarly, General Motors,[30] Volvo,[31] Polestar[32] and Rivian[33] have announced that they will also be adopting the NACS standard and several electric vehicle charging

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[25] See generally, 86 Fed. Reg 43726, 43799 (Aug. 10, 2021) ("Electrification of the vehicle fleet is likely to affect both the number and the nature of employment in the auto and parts sectors and related sectors, such as providers of charging infrastructure.").

[26] See, Tesla, Supercharger *available at* https://www.tesla.com/supercharger

[27] Tesla, Impact Report 2022 at 70 (showing Tesla Supercharger network 2022 uptime reliability at 99.95%).

[28] See, President Joe Biden (@POTUS) on Twitter (February 15, 2023) *available at* https://twitter.com/POTUS/status/1625983221279125504?s=20https://twitter.com/POTUS/status/1625983221279125504?s=20

[29] Ford, Ford EV Customers to Gain Access To 12,000 Tesla Superchargers; Company to Add North American Charging Standard Port in Future EVs (May 25, 2023) *available at* https://media.ford.com/content/fordmedia/fna/us/en/news/2023/05/25/ford-ev-customers-to-gain-access-to-12-000-tesla-superchargers--.html

[30] GM, General Motors Doubles Down on Commitment to a Unified Charging Standard and Expands Charging Access to Tesla Supercharger Network (June 8, 2023) *available at* https://www.prnewswire.com/news-releases/general-motors-doubles-down-on-commitment-to-a-unified-charging-standard-and-expands-charging-access-to-tesla-supercharger-network-301846599.html

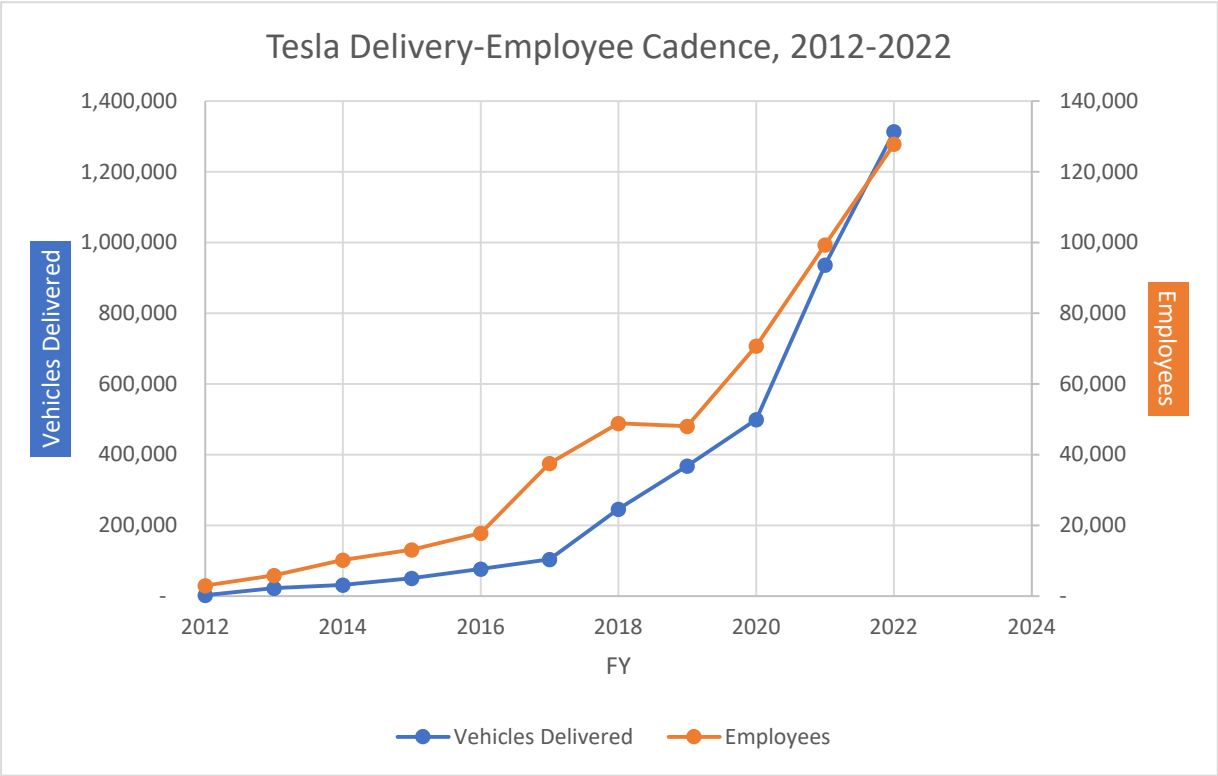
[31] Car & Driver, Volvo Is Latest Automaker to Agree to Adopt Tesla's Charge Port (June 27, 2023) *available at* https://www.caranddriver.com/news/a44350518/volvo-electric-vehicles-tesla-charging-2025/

[32] Businesswire, Polestar will adopt North American Charging Standard to enable access to Tesla Supercharger network in USA and Canada (June 29, 2023) *available at* https://www.businesswire.com/news/home/20230629093526/en/Polestar-will-adopt-North-American-Charging-Standard-to-enable-access-to-Tesla-Supercharger-network-in-USA-and-Canada

[33] Rivian, Rivian Accelerates Electrification through Adoption of North American Charging Standard and Access to Tesla's Supercharger Network for Rivian Drivers (June 20, 2023) *available at* https://www.businesswire.com/news/home/20230620267452/en/Rivian-Accelerates-Electrification-through-Adoption-of-North-American-Charging-Standard-and-Access-to-Tesla%E2%80%99s-Supercharger-Network-for-Rivian-Drivers

manufacturers, including ABB,[34] Flo,[35] and BTC Power[36] also announced that they would be supplying NACS capable chargers moving forward. Numerous charging providers have also followed suit.[37]

Figure 1: Tesla Global Delivery Volume and Job Growth



II. Rapid Electrification of the Light-Duty Vehicle Sector Is Necessary to Protect the Public Health and Welfare

Tesla supports EPA's efforts to accelerate light-duty vehicle electrification as it is essential for reducing greenhouse gas (GHG) and criteria pollutants and addressing the rapidly escalating climate crisis. Regardless of the application, EPA has long considered BEVs to be the most effective mobile source pollution mitigating technology, stating over a decade ago, "From a vehicle tailpipe perspective, EVs are a game-changing technology."[38] Additionally, study after study shows BEVs are a superior technology for reducing air pollution

[34] ABB, ABB E-Mobility is Adding North American Charging Standard (NACS) as an Option to Our Products (June 9, 2023) *available at* https://twitter.com/ABBNorthAmerica/status/1667139962830041091https://twitter.com/ABBNorthAmerica/status/1667139962830041091

[35] FLO, FLO Stations to Offer North American Charging Standard (NACS); Supports Broader Use (June 8, 2023) *available at* https://www.flo.com/news/flo-stations-to-offer-north-american-charging-standard-nacs-supports-broader-use/ /

[36] BTC Power, BTC POWER To Introduce North American Charging Standard (NACS) Compatibility For Enhanced EV Charger Accessibility (June 20, 2023) *available at* https://btcpower.com/blog/btc-power-to-introduce-north-american-charging-standard-nacs-compatibility-for-enhanced-ev-charger-accessibility/

[37] See, EV Station, Tesla NACS Charger Adoption Tracker *available at* https://evstation.com/tesla-nacs-charger-adoption-tracker/

[38] 77 Fed. Reg.62624, 62815 (Oct. 15, 2012); See also, IPCC, AR6 Climate Change 2022: Mitigation of Climate Change (April 4, 2022) at 2-78 (Electric vehicles (EVs) powered by clean electricity can reduce GHG emissions and such policies are

and GHG emissions over their lifetime.[39] On a well to wheels analysis including upstream emissions, the U.S. Department of Energy (DOE) has repeatedly found BEVs to be far superior in emission performance than internal combustion engine (ICE) technology.[40] For example, a Tesla Model 3 or Model Y charging on the U.S. grid has average lifecycle emissions almost 3.5 times less than an average premium ICE vehicle.[41] As a result, over a 17-year lifetime, a Tesla vehicle driver can avoid emitting over 55 tons of CO2e.[42]

Moreover, as the carbon intensity of domestic electricity generation continues to decline, BEV emission performance becomes better and better over time.[43] In short, consistent with Clean Air Act Section 202(a), BEVs represent a completely designed system to fully prevent and control air pollution.[44]

As the agency highlights, light-duty vehicles are major emitters of climate-warming GHGs, stating:

> The transportation sector is the largest U. S. source of GHG emissions, representing 27.2 percent of total GHG emissions. Within the transportation sector, light-duty vehicles are the largest contributor, at 57.1 percent, and thus comprise 15.5 percent of total U.S. GHG emissions, even before considering the contribution of medium-duty Class 2b and 3 vehicles which are also included under this rule.[45]

As EPA has already determined, vehicle GHG emissions endanger public health and welfare.[46] Since the issuance of the Endangerment Finding continued peer-reviewed scientific analysis has further elucidated the level of GHG emission reduction needed to adequately protect the public welfare.[47] In finalizing the requisite level of emissions reduction in the new light-duty standards, the agency should look first toward the consensus UNFCCC

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important for spurring adoption of such vehicles and GHG emission reductions); at 10-41 (BEVs manufactured and operated can lower emission by 85% compared to ICE vehicles) *available at* https://report.ipcc.ch/ar6wg3/pdf/IPCC_AR6_WGIII_FinalDraft_FullReport.pdf (last visited Sept. 12, 2022).

[39] See e.g., McKinsey, Battery 2030: Resilient, sustainable, and circular (Jan. 16, 2023) (In the worst case scenario, with no low-carbon electricity, total life-cycle emissions for BEVs are about 50 percent lower in Europe and 72 percent lower in the United States compared with ICE vehicles) *available at* https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/battery-2030-resilient-sustainable-and-circular?stcr=032392E457A548838A737BD614EB8B24&cid=other-eml-alt-mip-mck&hlkid=38d0ad0585af40979275683ed8a9d167&hctky=10204926&hdpid=b8cb9677-a52c-48a1-b6ae-ded25e562aac; Environmental Research Letters, Mapping electric vehicle impacts: greenhouse gas emissions, fuel costs, and energy justice in the United States (Jan. 11, 2023) (finding that over 90% of vehicle-owning U.S. households would see reductions in both GHGs and transportation energy burden by adopting an EV) *available at* https://iopscience.iop.org/article/10.1088/1748-9326/aca4e6?utm_source=cbnewsletter&utm_medium=email&utm_term=2023-01-14&utm_campaign=Daily+Briefing+12+01+2023; ICCT, A global comparison of the life-cycle greenhouse gas emissions of combustion engine and electric passenger cars (July 20, 2021) *available at* https://theicct.org/publications/global-LCA-passenger-cars-jul2021 ; National Academies of Science, Accelerating Decarbonization of the U.S. Energy System (Feb. 2, 2021) at 97 ("Further, light-duty trucks and buses should be electrified, particularly in urban areas. Over the next decade, the United States needs to ensure that electric vehicles become the predominant share of new purchases."); *available at* https://www.nap.edu/read/25932; Environment International, Assessing the health impacts of electric vehicles through air pollution in the United States (Nov. 2020) *available at* https://www.sciencedirect.com/science/article/pii/S016041202031970X

[40] See, Department of Energy, Alternative Fuels Data Center, Emissions from Hybrid and Plug-In Electric Vehicles *available at* https://afdc.energy.gov/vehicles/electric_emissions.htmlhttps://afdc.energy.gov/vehicles/electric_emissions.html

[41] Tesla, Impact Report 2022 at 31-34.

[42] Tesla, Impact Report 2022 at 22, 149.

[43] See e.g., IPCC, AR 6, Working Group III, Climate Change 2022: Mitigation of Climate Change (April 4, 2022) at 98 *available at* https://www.ipcc.ch/report/ar6/wg3/

[44] 42 U.S.C. §7521(a).

[45] 88 Fed. Reg. at 29816-17.

[46] 74 Fed. Reg. 66496 (Dec. 15, 2009) (Endangerment Finding).

[47] See, 88 Fed. Reg. at 29208.

and IPCC goal of limiting global warming to below 1.5 degrees Celsius compared to pre-industrial levels as its baseline.[48] The U.S. has adopted an international commitment to put policies in place consistent with this protective aim.[49] To meet this new target the U.S. has committed to achieve a 50-52 percent reduction from 2005 levels in economy wide GHG pollution in 2030.[50] This commitment is part of the national effort to prevent significant domestic impacts from climate change[51] and embodies near term action commensurate with meeting this benchmark.[52] Further, EPA recognizes the need to promulgate regulations that "would contribute toward the goal of holding the increase in the global average temperature to well below 2 °C above pre-industrial levels, and subsequently reduce the probability of severe climate change related impacts including heat waves, drought, sea level rise, extreme climate and weather events, coastal flooding, and wildfires."[53]

As part of this effort, numerous studies have highlighted that electrifying the light-duty fleet as rapidly possible will enable the U.S. to meet its commitment and equitably contribute to emissions reductions that adequately protect the country's health and welfare.[54] For example, a central component of the U.S. long-term climate strategy in transportation is the "rapid expansion of zero-emission vehicles—in as many applications as possible across light-, medium-, and heavy-duty applications."[55] Moreover, the American Lung Association (ALA) found that the environmental benefits from electrifying the transportation sector in the form of avoided climate

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[48] See generally, UNFCCC, Key aspects of the Paris Agreement *available at* https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement/key-aspects-of-the-paris-agreement

[49] The United States of America Nationally Determined Contribution Reducing Greenhouse Gases in the United States: A 2030 Emissions Target (April 21, 2021) at 23. *available at* https://unfccc.int/sites/default/files/NDC/2022-06/United%20States%20NDC%20April%2021%202021%20Final.pdf ("As noted above, the United States' NDC is consistent with the Paris Agreement temperature goal of holding the increase in the global average temperature to well below 2 degrees Celsius above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5 degrees Celsius above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change (Article 2.1(a)").

[50] White House: FACT SHEET: President Biden Sets 2030 Greenhouse Gas Pollution Reduction Target Aimed at Creating Good-Paying Union Jobs and Securing U.S. Leadership on Clean Energy Technologies (April 22, 2021) *available at* https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-president-biden-sets-2030-greenhouse-gas-pollution-reduction-target-aimed-at-creating-good-paying-union-jobs-and-securing-u-s-leadership-on-clean-energy-technologies/

[51] See, President Biden, Executive Order 14008, Tackling the Climate Crisis at Home and Abroad, 86 Fed. Reg. 7619 (Feb. 1, 2021). *available at* https://www.federalregister.gov/documents/2021/02/01/2021-02177/tackling-the-climate-crisis-at-home-and-abroad

[52] See, Nature, Realization of Paris Agreement pledges may limit warming just below 2 °C (April 13, 2022) *available at* https://www.nature.com/articles/s41586-022-04553-z?utm_source=newsletter&utm_medium=email&utm_campaign=newsletter_axiosgenerate&stream=top
(Limiting warming not only to 'just below' but to 'well below' 2 degrees Celsius or 1.5 degrees Celsius urgently requires policies and actions to bring about steep emission reductions this decade, aligned with mid-century global net-zero CO_2 emissions.)

[53] 88 Fed. Reg. at 29199.

[54] See e.g., IPCC, AR 6, Working Group III, Climate Change 2022: Mitigation of Climate Change (April 4, 2022) at 1109 *available at* https://www.ipcc.ch/report/sixth-assessment-report-working-group-3/ (highlighting among other scenarios full light duty vehicle electrification being the most promising low-carbon pathway to meet a 1.75°C goal); See also, UNFCCC, Nationally determined contributions under the Paris Agreement; Synthesis report by the secretariat (Feb. 26, 2021) at 32 *available at* https://unfccc.int/documents/268571https://unfccc.int/documents/268571 (In terms of specific technologies that Parties intend to use for achieving their adaptation and mitigation targets, the most frequently identified were energy efficient appliances and processes, renewable energy technologies, *low- or zero-emission vehicles* and hydrogen technologies) (emphasis added).

[55] United States Executive Office of the President, The Long-Term Strategy of The United States Pathways to Net-Zero Greenhouse Gas Emissions by 2050 (Nov. 2021) at 31. *available at* https://www.whitehouse.gov/wp-content/uploads/2021/10/US-Long-Term-Strategy.pdf

change impacts, as expressed as the social cost of carbon,[56] could surpass $113 billion in 2050 as transportation systems combust far less fuel and our power system comes to rely on cleaner, non-combustion renewable energy.[57]

A number of studies show that the light-duty sector must rapidly decarbonize beginning this decade to meet the U.S. commitments. Further, the need for the rapid deployment of light-duty BEVs is even more critical given the lengthening time it takes to turn over the light-duty fleet. Currently, the average age of light-duty vehicles on the road in the U.S. is now at an all-time high of 12.5 years compared to two decades ago when the average age was 9.7 years.[58] To meet the goal of limiting global warming for below 1.5 degrees C the passenger fleet must primarily be composed of BEVs by 2050.[59] Given the aging vehicle fleet, this requires vehicles sales consisting of 100% BEVs in the early 2030s.[60] Other studies have similarly highlighted BEV sales need to reach 95% by 2035 to meet the 1.5 degree C target.[61] Still others have found that in order to meet net-zero emission by 2050 60% of vehicle sales must be BEVs in 2030 with no new ICE vehicle sales occurring after 2035.[62]

In addition to light-duty vehicles being one of the largest sources of GHG pollutants that negatively impact public health, they are also one of the largest sources of criteria and air toxic pollutants, including particulate matter (PM) and nitrogen oxides (NO_X). To that end, Tesla fundamentally agrees with the agency that:

> In 2023, mobile sources will account for approximately 54 percent of anthropogenic NOX emissions, 5 percent of anthropogenic direct PM2.5 emissions, and 19 percent of anthropogenic volatile organic compound (VOC) emissions. Light and medium-duty-vehicles will account for

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[56] See, White House, Technical Support Document: Social Cost of Carbon, Methane, and Nitrous Oxide Interim Estimates under Executive Order 13990 (Feb. 2021). *available at* https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf

[57] American Lung Association, The Road to Clean Air Benefits of a Nationwide Transition to Electric Vehicles (2020) at 6 *available at* https://www.lung.org/clean-air/electric-vehicle-report/electric-vehicle-report-2020#:~:text=The%20%22Road%20to%20Clean%20Air,diesel%20power)%20and%20toward%20electric

[58] Axios, Gas-powered cars won't die off any time soon (May 15, 2023) *available at* https://www.axios.com/2023/05/15/ev-electric-vehicles-gas-trucks-suvs-cars-aging?utm_source=newsletter&utm_medium=email&utm_campaign=newsletter_axiosgenerate&stream=top

[59] Dimanchev, et al. The 4Ds of Energy Transition: Decarbonization, Decentralization, Decreasing Use and Digitalization, Electric Vehicle Adoption Dynamics on the Road to Deep Decarbonization (July 15, 2022) (highlighting that published pathways indicate that the passenger vehicle fleet must be primarily comprised of zero-emission vehicles by 2050, in a future consistent with keeping global warming below 2 or 1.5 °C. With the average lifetime of internal combustion cars in the U.S. is 16 years, achieving a ZEV share consistent with 1.5°C pathways would require a combination of a relatively early ban by around 2030 and an average non-ZEV lifetime shorter than 10 years.) *available at* https://onlinelibrary.wiley.com/doi/10.1002/9783527831425.ch8 (last visited Sept 12, 2022).

[60] Id.

[61] Bloomberg New Energy Finance, Net-Zero Road Transport By 2050 Still Possible, As Electric Vehicles Set To Quintuple By 2025 (June 1, 2022) (finding that be on n track for a net-zero global fleet by 2050, zero-emission vehicles need to represent 61% of global new passenger vehicle sales by 2030, 93% by 2035, and the last ICE vehicle of any segment needs to be sold by 2038.) *available at* https://about.bnef.com/blog/net-zero-road-transport-by-2050-still-possible-as-electric-vehicles-set-to-quintuple-by-2025/?utm_source=Email&utm_campaign=596500&utm_medium=Newsletter&utm_content=BNEFMonthInReviewJune&tactic=596500&pchash=

[62] International Energy Agency (IEA), World Energy Outlook 2022, An updated roadmap to Net Zero Emissions by 2050, How do we get to net zero emissions by 2050? (Oct. 27, 2022) *available at* https://www.iea.org/reports/world-energy-outlook-2022/an-updated-roadmap-to-net-zero-emissions-by-2050#abstract; See generally, ICCT, Emissions reduction benefits of a faster, global transition to zero-emission vehicles (March 2022) *available at* https://theicct.org/wp-content/uploads/2022/03/Accelerated-ZEV-transition-wp-final.pdf?utm_source=ICCT+mailing+list&utm_campaign=01b4a8f70d-lately_from_feb2018_COPY_01&utm_medium=email&utm_term=0_ef73e76009-01b4a8f70d-510835924

approximately 20 percent, 19 percent, and 41 percent of 2023 mobile source NOX, PM2.5, and VOC emissions, respectively.[63]

These emissions contribute to poor air quality in many urban areas, including areas with vulnerable populations, and increased vulnerability and susceptibility for adverse health effects related to air pollution in children.[64]

The widespread adoption of BEVs is leading to significant benefit from the elimination of tailpipe pollutants and slashing of ambient levels of air pollutants that have been linked to hundreds of thousands of early deaths annually around the world from cardiovascular and respiratory diseases, cancer, and other illnesses.[65] Indeed, the public health, climate, and economic benefit from much more stringent, BEV-based GHG emission standards cannot be understated. Air pollution is estimated to cause over 200,000 premature deaths in the U.S. each year; with more than half are caused by transportation emissions.[66] Recent findings indicate that the U.S. health care costs of air pollution and climate change exceed $800 billion per year.[67] Air pollution impacts with pollutants like PM2.5 that are associated with the transportation sector not only cause premature mortality, cardiovascular disease and respiratory disease but also can affect neurological disorders.[68] Other studies suggest that exacerbation of air pollution and heat exposure related to climate change may be significantly associated with risk to pregnancy outcomes in the U.S.[69]

These negative effects of air pollution disproportionately harm the most vulnerable populations, including children, the elderly, and residents in low-income and disadvantaged communities.[70] Indeed, two-thirds of Americans who live near high-volume roads are people of color and the median household income in these places is roughly 20% below the national average.[71] Repeatedly, peer reviewed, government and inter-governmental studies point to electrification as key to addressing criteria air pollutants, improving air quality, and lower the risk of respiratory illness.[72]

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[63] 88 Fed. Reg. at 29186.
[64] Id., at 29211.
[65] PNAS, The other benefit of electric vehicles (Jan. 11, 2023) *available at* https://www.pnas.org/doi/10.1073/pnas.2220923120
[66] Atmospheric Environment, Air pollution and early deaths in the United States. Part I: Quantifying the impact of major sectors in 2005 (Nov. 2013) *available at* https://www.sciencedirect.com/science/article/abs/pii/S1352231013004548; See also, PNAS, Fine-scale damage estimates of particulate matter air pollution reveal opportunities for location-specific mitigation of emissions (April 8, 2019) *available at* https://www.pnas.org/doi/10.1073/pnas.1816102116 (Over 100,000 premature death just from PM 2.5).
[67] Medical Society Consortium, The Costs of Inaction: The Economic Burden of Fossil Fuels and Climate Change on Health in the United States (May 20, 2021) *available at* https://subscriber.politicopro.com/f/?id=00000179-8a79-de79-a9ff-ae7dbc420000&source=email
[68] The Lancet, Long-term effects of $PM_{2\cdot5}$ on neurological disorders in the American Medicare population: a longitudinal cohort study (Oct. 19, 2020). *available at* https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(20)30227-8/fulltext#.X44Xfg2Mloo.twitter
[69] Bekkar, et al. JAMA Open Network, Association of Air Pollution and Heat Exposure with Preterm Birth, Low Birth Weight, and Stillbirth in the USA Systematic Review (June 18, 2020). *available at* https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2767260
[70] U.N. Environmental Programme, Young and old, air pollution affects the most vulnerable (Oct. 16, 2018). *available at* https://www.unep.org/news-and-stories/blogpost/young-and-old-air-pollution-affects-most-vulnerable#:~:text=Since%20children%20are%20still%20growing,of%20conditions%20such%20as%20asthma
[71] Union of Concerned Scientists, Delivering Opportunity: How Electric Buses and Trucks Can Create Jobs and Improve Public Health in California," (Oct. 11,2016), at 10. *available at* https://www.ucsusa.org/resources/delivering-opportunity
[72] See e.g., International Panel on Climate Change (IPCC), AR 6 Climate Change 2022: Impacts, Adaptation and Vulnerability (Feb. 28, 2022) at 7-120 *available at* https://report.ipcc.ch/ar6wg2/pdf/IPCC_AR6_WGII_FinalDraft_FullReport.pdf; USGCRP, National Climate Assessment 4, Volume II, Chapter 29 at Box 29.2 *available at* https://nca2018.globalchange.gov/chapter/29/https://nca2018.globalchange.gov/chapter/29/ (In transportation, for example, switching away from petroleum to potentially lower GHG fuels, such as electricity and hydrogen, is projected to

Indeed, one recent report estimates that wide-spread transportation electrification across the U.S. translates into $72 billion in avoided health effects. Electrification would save approximately 6,300 lives per year and avoid more than 93,000 asthma attacks, and 416,000 lost workdays annually due to significant reductions in transportation-related pollution.[73] Other studies have found dramatic localized air quality and public health benefits can result from vehicle electrification.[74]

In short, electrifying the light-duty duty sector will provide significant improvements in air quality and benefits to all Americans through reduced GHG, NO_X, PM, and other air pollutant emissions. Tesla believes it is essential for EPA to establish stringent longer-term light-duty multi-pollutant emission standards that actively embrace a more rapid transition to BEVs. A failure of the agency to finalize a performance standard that substantially puts the light-duty sector on a path to full electrification by at least 2035 and sufficiently reduces U.S. emissions commensurate with the country's commitment to holding global warming to well below 2 degrees Celsius would not meet the legal benchmark of the Clean Air Act to protect the nation's public health and welfare.

III. The Current and Rapidly Evolving State of Vehicle Electrification

In general, EPA appropriately recognizes the acceleration of electrification technology being developed and deployed throughout the auto industry.[75] Indeed, the agency points toward the numerous manufacturer statements announcing BEV production goals that encompass the timeframe of the proposed standard. These announcements have continued to expand during the process of this rulemaking with Toyota, Hyundai, JLR, and Subaru, among others, announcing new commitments on BEVs.[76] Correctly, EPA utilizes these public

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reduce local air pollution. In California, drastic GHG emissions reductions have been estimated to improve air quality and reduce local particulate matter emissions associated with freight transport that disproportionately impact disadvantaged communities").

[73] American Lung Association, The Road to Clean Air Benefits of a Nationwide Transition to Electric Vehicles (March 31, 2022) at 5-6 *available at* https://www.lung.org/getmedia/99cc945c-47f2-4ba9-ba59-14c311ca332a/electric-vehicle-report.pdf; See also, ZETA, Medium- and Heavy Duty Electrification: Weighing the Opportunities and Barriers to Zero Emission Fleets (Jan. 26, 2022) at 8-9 *available at* https://fs.hubspotusercontent00.net/hubfs/8829857/ZETA-WP-MHDV-Electrification_Opportunities-and-Barriers_Final3.pdf?utm_medium=email&_hsmi=201943899&_hsenc=p2ANqtz-8eoZgga7znbaZR7rKv1BaBniH18i3bFI9C8FLIYVA9UYMBZ-H5_7edvGf11_aMiDLUt4tVYShiR--I9VYfDXozCMAQgQ&utm_content=201943899&utm_source=hs_email

[74] See e.g., Texas A&M, Tailpipe Emission Benefits of Medium- and Heavy-Duty Truck Electrification in Houston, TX (Apr 14, 2021) *available at* https://carteehdata.org/library/document/tailpipe-emission-benefit-7ea6 (Finding that by electrifying 40% of the predominantly diesel-fueled MHDVs in the eight-county area, Texans could avoid 21 tons per day of NO_X — over a quarter of the 80 tons per day emitted by greater Houston's on-road traffic. This could be achieved by electrifying a little over 60,000 MHDVs, about 1% of all the vehicles in greater Houston. By comparison, it would take 3.8 million light duty vehicles to achieve the same amount of NO_X reductions. Electrification of MHDVs is the quickest way to take the biggest bite out of greater Houston's NO_X emissions.)

[75] See generally, 88 Fed. Reg. at 29187-29195.

[76] See e.g., Toyota, Toyota Unveils New Technology That Will Change the Future of Cars (June 13, 2023) available at https://global.toyota/en/newsroom/corporate/39288520.html?utm_source=newsletter&utm_medium=email&utm_campaign=newsletter_axiosgenerate&stream=top; Reuters, Hyundai Motor Group to invest $18 bln in South Korean EV industry by 2030 (Apr. 11, 2023) (expanding annual EV production in Korea to 1.51 million units and global volume to 3.64 million units by 2030 *available at* https://www.reuters.com/business/autos-transportation/hyundai-motor-group-invest-18-bln-ev-industry-skorea-by-2030-2023-04-11/; Reuters, Jaguar Land Rover boosts investment to catch up in EV race (Apr. 20, 2023) (Investing $19 billion over the next five years in BEVs) *available at* https://www.reuters.com/business/autos-transportation/jaguar-land-rover-plans-invest-15-bln-pounds-electric-push-2023-04-19/?utm_source=newsletter&utm_medium=email&utm_campaign=newsletter_axiosgenerate&stream=top; Electrek, Subaru suddenly breaks electric following tripled annual profits, promises 4 crossover EVs in US (May 11, 2023*) available at* https://electrek.co/2023/05/11/subaru-electric-tripled-annual-profits-promises-4-crossover-ev-us/

commitments in its analysis of the industry, and they reflect manufacturers' ability to meet stringent multi-pollutant emissions standards.[77]

Nonetheless, EPA's proposed standards are set at a level less stringent than the depth and pace of electrification technology deployment that has already occurred and will be accelerated through market forces and numerous other state and federal policies. BEV deployment, like other technologies, will follow a S curve leading to a much more rapid pace of adoption between now and when the proposed regulations take hold. Indeed, many manufacturers have rapidly placed innovative technology across major portions of their new vehicle offerings in only a few model years.[78] BEV technology will continue to follow similar paths, and deployment has already been shown to outperform the traditional S curve.[79]

Since the release of the proposed rule, figures indicate that in Q1 2023 the U.S. recorded the highest BEV sales increase (64%) ever.[80] Continuing this rapid growth has led to estimates that by 2024 every third commercially newly registered car could be an electric vehicle.[81] This increase is consistent with other projects of rapid BEV sales growth. Some analysts predict that by 2026 60% of new models will be BEVs and PHEVs.[82] Others suggest recent forecasts, like those of IEA, still significantly underestimate the pace of electrification.[83] Still other analysts project that BEVs could account for 90% of sales by 2027.[84]

Further, California's recent adoption of the ACC II rule, setting a 100 percent zero-emission vehicle (ZEV) sales standard by 2035, will also accelerate BEV adoption. As EPA recognizes, a number of states have already adopted ACC II and the list is growing.[85] New research assessing the impact of additional states adopting California's standards (accounting for the IRA's tax credits) finds that adoption by California and 16 other states

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[77] See generally, BNEF, Zero Emission Vehicle Factbook: A BloombergNEF Special Report for COP 27 (Nov. 2022) (finding automakers have collectively committed to sell around 43 million EVs per year by 2030, and automakers with planned phase-outs of combustion engines now account for 30% of the global auto market.) available at https://assets.bbhub.io/professional/sites/24/2022-COP27-ZEV-Transition_Factbook.pdf?utm_source=newsletter&utm_medium=email&utm_campaign=newsletter_axiosgenerate&stream=top. It should be note that even this figure from less than a year ago is already outdated.

[78] See e.g., Hula, et al, Analysis of Technology Adoption Rates in New Vehicles, *SAE International* (April 1, 2014) *available at* https://www.epa.gov/sites/default/files/2016-10/documents/2014-01-0781_0.pdf

[79] Ark Investment, Electric Vehicles Are Outperforming the Traditional S-Curve Dynamics (July 2, 2019) *available at* https://ark-invest.com/articles/analyst-research/ev-growth-outperforming-the-traditional-s-curve-dynamics/

[80] Strategy& (PwC), Electric Vehicle Sales Review Q1-2023: From 2024, every third commercially registered car could be an electric vehicle (May 15, 2023) *available at* https://www.strategyand.pwc.com/de/en/industries/automotive/electric-vehicle-sales-review-2023-q1.html

[81] Id.

[82] Automotive News, Car Wars study: By 2026, 60% of new models will be EV, hybrid (June 30, 2022) (citing a Bank of America Merrill Lynch Car Wars study predicting automakers will launch roughly 245 new models over the next four years.) *available at* https://www.autonews.com/sales/car-wars-study-2026-60-new-models-will-be-ev-hybrid?utm_source=dont-miss&utm_medium=email&utm_campaign=20220630&utm_content=hero-headline

[83] Sustainability by the Numbers, Electric cars are the new solar: people will underestimate how quickly they will take off (May 8, 2023*) available at* https://hannahritchie.substack.com/p/ev-iea-projections?utm_source=cbnewsletter&utm_medium=email&utm_term=2023-05-09&utm_campaign=Daily+Briefing+09+05+2023

[84] Ark Invest, Sales of Gas-Powered Vehicles Could Collapse 85% In the Next Five Years (Nov. 21, 2022) *available at* https://ark-invest.com/newsletters/issue-343/

[85] 88. Fed. Reg. at 29344; Bloomberg Law, More States Join California's Push to Phase Out Gas Cars by 2035 (May 16, 2023) *available at* https://news.bloomberglaw.com/environment-and-energy/more-states-join-californias-push-to-phase-out-gas-cars-by-2035

would accelerate electric vehicle adoption, cut 1.3 gigatons of carbon emissions (equivalent to closing 13 coal plants), create 300,000 new jobs, save households $230 per year, and prevent 5,000 deaths in 2050.[86]

IV. Tesla Has Demonstrated BEVs Cost Reductions Accompany Scale

As EPA recognizes, "zero and near-zero emission technologies are more feasible and cost-effective now than at the time of prior rulemakings."[87]. To address this Tesla has been a leader in reducing the costs of high-performance BEVs. A Tesla Model 3's starting price is $40,240 and, inclusive of individual qualification with the current U.S. 30D tax credit, can reach an equivalent price of $32,740.[88] As recently reported, the Model 3 sells for now sells for $4,930 less than the average new vehicle sold in the U.S.[89] Tesla has further outlined a pathway to reducing the production cost of its next generation vehicle by 50%.[90] As evidenced by the popularity of its Model Y and Model 3 vehicles, Tesla has also demonstrated that increases in production volumes can reduce BEV costs to levels favoring them in the marketplace and facilitating broad consumer acceptance.[91]

Tesla also agrees with the agency that there is an "emerging consensus that purchase price parity is likely to occur by the mid-2020s for some vehicle segments and models, and for a broader segment of the market on a total cost of ownership (TCO) basis."[92] Indeed, this parity has already been reached by Tesla. The Tesla Model 3 has a TCO better than a Toyota Corolla.[93] Numerous other studies have found that on a TCO basis BEVs are already competitive with ICE vehicles and overall cheaper to own.[94] In short, there is a compelling case to be made that BEV costs already favor their adoption over ICE vehicles in the marketplace.

A. Battery Costs Declines and Improved Efficiency Will Further Lower BEV Costs

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[86] Energy Innovation, Nationwide Impacts Of California's Advanced Clean Cars II Rule (April 9, 2023) *available at* https://energyinnovation.org/publication/nationwide-impacts-of-californias-advanced-clean-cars-ii-rule/

[87] 88 Fed. Reg. at 29188.

[88] Tesla, Model 3 *available at* https://www.tesla.com/model3

[89] Bloomberg, Tesla Undercuts Average US Car by Almost $5,000 in EV Shakeout (Feb. 21, 2023) *available at* https://www.bloomberg.com/news/articles/2023-02-21/tesla-undercuts-average-us-car-by-almost-5-000-in-ev-shakeout#xj4y7vzkg

[90] Tesla, 2023 Investor Day Presentation (March 1, 2023) at 31-73, 119-131, 158 *available at* https://digitalassets.tesla.com/tesla-contents/image/upload/IR/Investor-Day-2023-Keynote; Tesla, Impact Report 2022 at 64.

[91] 88 Fed. Reg. at 29312; See also, Bloomberg, Tesla and BYD Post Record Sales on Surge in Electric-Car Demand (July 3, 2023) *available at* https://www.bloomberg.com/news/articles/2023-07-02/tesla-sets-a-new-delivery-record-as-price-cuts-yield-results

[92] 88 Fed. Reg. at 29190; See also, IPCC AR 6 Working Group III, Climate Change 2022: Mitigation of Climate Change (April 4, 2022) at 1079 (stating BEVs are quickly reaching cost parity with ICEVs).

[93] Tesla 2023 Investor Day Presentation at 159; Tesla Impact Report 2022 at 63.

[94] Energy Innovation, Most Electric Vehicles Are Cheaper to Own Off the Lot Than Gas Cars (May 13, 2022) available at https://energyinnovation.org/wp-content/uploads/2022/05/Most-Electric-Vehicles-Are-Cheaper-Off-the-Lot-Than-Gas-Cars-From-Day-One.pdf?utm_source=newsletter&utm_medium=email&utm_campaign=newsletter_axiosgenerate&stream=top; Atlas Public Policy, Total Cost of Ownership Analysis (Feb. 2022) available at https://atlaspolicy.com/wp-content/uploads/2022/01/Total-Cost-of-Ownership-Analysis.pdf; ICCT, Assessment of Light-Duty Electric Vehicle Costs and Consumer Benefits in the United States in the 2022–2035 Time Frame (Oct. 18, 2022) available at https://theicct.org/publication/ev-cost-benefits-2035-oct22/; Pickup & SUV Talk, Ford F-150 deep dive: The cost of owning gas vs. electric trucks (Aug. 25, 2022) *available at* https://pickuptrucktalk.com/2022/08/ford-f-150-deep-dive-the-cost-of-owning-gas-vs-electric-trucks/
DOE VTO, FOTW #1251, August 15, 2022: Electric Vehicles Have the Lowest Annual Fuel Cost of All Light-Duty Vehicles (Aug. 15, 2022) *available at* https://www.energy.gov/eere/vehicles/articles/fotw-1251-august-15-2022-electric-vehicles-have-lowest-annual-fuel-cost-all

Consistent with vehicle price reduction, BEV battery prices continue to decline in rapid fashion. As DOE has recently documented, the energy density of lithium-ion batteries Increased by more than eight times between 2008 and 2020, allowing for BEVs to travel the same distance with a smaller battery pack, thus saving space, weight, and manufacturing costs.[95] Similarly, DOE has found that BEV battery pack cost dropped 90% since 2008.[96]

Moreover, almost all analysts project profound reductions in battery costs by 2030. For example, UBS reports that leading manufacturers are estimated to reach battery pack costs as low as $67/kWh between 2022 and 2024.[97] Recently, others have also projected costs significantly lower than EPA's past projections. BNEF's has estimated that pack prices go below $100/kWh on a volume-weighted average basis by 2024, hit $58/kWh in 2030,[98] and could achieve a volume-weighted average price of $45/kWh in 2035.[99] The National Academies of Sciences found high-volume battery pack production would be at costs of $65-80/kWh by 2030[100] and DNV-GL has predicted costs declining to $80/kWh in 2025.[101] The IPCC recently concluded similarly.[102] These cost estimates all were projected before the Inflation Reduction Act (IRA) passed Congress. The IRA adds a significant new element to battery cost reduction as Section 45X provides domestically manufactured cells and finished batteries a production tax credit of $45/kWh.[103] This new policy has accelerated significant new domestic battery production capacity that will generate further cost reductions.[104] Indeed, the 45X production tax credit is

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[95] DOE VTO, FOTW #1234, April 18, 2022: Volumetric Energy Density of Lithium-ion Batteries Increased by More than Eight Times Between 2008 and 2020 (Apr. 18, 2022). *available at* https://www.energy.gov/eere/vehicles/articles/fotw-1234-april-18-2022-volumetric-energy-density-lithium-ion-batteries

[96] DOE, FOTW #1272, January 9, 2023: 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

[97] UBS, EVs Shifting into Overdrive: VW ID.3 teardown – How will electric cars re-shape the auto industry? (March 2, 2021) at 60 *available at* https://www.ubs.com/global/en/investment-bank/in-focus/2021/electric-vehicle-revolution.html

[98] BNEF, Electric Vehicle Outlook 2021 (June 9, 2021) *available at* https://bnef.turtl.co/story/evo-2021/

[99] BNEF, Hitting the Inflection Point: Electric Vehicle Price Parity and Phasing Out Combustion Vehicle Sales in Europe (May 5, 2021) *available at* https://www.transportenvironment.org/sites/te/files/publications/2021_05_05_Electric_vehicle_price_parity_and_adoption_in_Europe_Final.pdf

[100] NAS, Assessment of Technologies for Improving Light-Duty Vehicle Fuel Economy – 2025-2035 (March 31, 2021) *available at* https://www.nap.edu/resource/26092/Briefing Slides Public Release Final 20210331.pdf

[101] DNV-GL, Tesla's Battery Day and the Energy Transition (Oct. 26, 2020) *available at* https://www.dnvgl.com/feature/tesla-battery-day-energy-transition.html?utm_campaign=GR_GLOB_20Q4_PROM_ETO_2020_Tesla_Battery_Article&utm_medium=email&utm_source=Eloqua

[102] IPCC, AR 6, Working Group III, Climate Change 2022: Mitigation of Climate Change (April 4, 2022) at 10-32 *available at* https://report.ipcc.ch/ar6wg3/pdf/IPCC_AR6_WGIII_FinalDraft_FullReport.pdf (For example, according to IEA, battery pack costs could be as low as 80 USD per kWh by 2030 (IEA 2019a). In addition, there are clear trends that now vehicle manufacturers are offering vehicles with bigger batteries, greater driving ranges, higher top speeds, faster acceleration, and all size categories (Nykvist et al. 2019). In 2020 there were over 600,000 battery-electric buses and over 31,000 battery-electric trucks operating globally (IEA 2021a).)

[103] Inflation Reduction Act, P.L. 117-169 (Aug. 16, 2022) at Section 13502.

[104] DOE, FOTW #1271, January 2, 2023: Electric Vehicle Battery Manufacturing Capacity in North America in 2030 is Projected to be Nearly 20 Times Greater than in 2021 (Jan. 2, 2023) *available at* https://www.energy.gov/eere/vehicles/articles/fotw-1271-january-2-2023-electric-vehicle-battery-manufacturing-capacity; Argonne National Lab, Assessment of Light-Duty Plug-in Electric Vehicles in the United States, 2010 – 2021 (Nov. 2022) *available at* https://publications.anl.gov/anlpubs/2022/11/178584.pdf

predicted to cut one-third to one-half off the total cost of any BEV battery with both cells and pack built in the U.S.[105]

In general, Tesla believes the agency's cost assumptions are far too high and are not supported by the record in that they do not fully consider the documented and projected rapid decline in battery cell and pack costs, as well the significant BEV range increases achieved through other efficiencies. From 2017 -2022, the Model 3 powertrain evolved with a 20% lighter drive unit, 25% less rare earth minerals, a 75% smaller powertrain factory, and a 65% cheaper powertrain factory.[106] While the agency's proposal suggests that vehicle battery size will grow, Tesla requests the EPA take into account that it has consistently increased range without increasing battery size.[107] For example, the Model Y All-Wheel Drive (AWD) achieves 4.0 EPA miles/kWh, which makes it the most efficient electric SUV ever made.[108] More profoundly, Tesla is hard at work on battery cell innovations. Tesla has announced and documented a path toward battery cell production that it expects will lower kWh battery costs by over 50%.[109]

Finally, the agency's assessment should further recognize the technology forcing created by finalization of the proposed regulations by factoring in battery cost reductions that will likely be seen during the MY 2027-32 period as well, including LFP applications[110] and sodium ion batteries.[111] In some forecasts, LFP is viewed at rapidly growing to capture up to 47% of the EV market by 2026 resulting in dramatically lower battery pack prices.[112] Indeed, battery technologies entering the commercialization phase such as silicon anodes, solid state batteries, and sodium-ion batteries are predicted to improve performance and costs and alter current material supply chains.[113] The current regulatory impact statement only makes glancing reference to these technologies and the record is deficient in this respect.[114]

V. EPA's Proposal for the MY 2027 and Beyond Multi-Pollutant Standards Should Be Strengthened

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[105] Car and Driver, U.S.-Made EVs Could Get Massively Cheaper, Thanks to Battery Provisions in New Law (Feb. 3, 2023*) available at* https://www.caranddriver.com/news/a42749754/us-electric-cars-could-get-cheaper-inflation-reduction-act-section-45x/

[106] Tesla, 2023 Investor Day Presentation (March 1, 2023) at 51.

[107] See, Tesla, Model S Long Range Plus: Building the First 400-Mile Electric Vehicle (June 15, 2020) (discussing Model S Long Range Plus vehicles having an official EPA-rated range of 402 miles, representing a nearly 20% increase in range when compared to a 2019 Model S 100D with the same battery pack design) *available at* https://www.tesla.com/blog/model-s-long-range-plus-building-first-400-mile-electric-vehicle; Tesla, The Longest-Range Electric Vehicle Now Goes Even Farther (April 23, 2019) *available at* https://www.tesla.com/blog/longest-range-electric-vehicle-now-goes-even-farther

[108] Tesla 2023 Investor Day Presentation at 50; Tesla Impact Report 2022 at 36-37.

[109] Tesla, Battery Day Presentation (Sept. 22, 2020) *available at* https://tesla-share.thron.com/content/?id=96ea71cf-8fda-4648-a62c-753af436c3b6&pkey=S1dbei4

[110] See, EPA, Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles, Draft Regulatory Impact Analysis (Draft RIA) at 28; See also, CleanTechnica, Designwerk Offers LFP Battery Cells for The HIGH CAB Semi Lowliner (April 25, 2023) *available at* https://cleantechnica.com/2023/04/25/designwerk-offers-lfp-battery-cells-for-the-high-cab-semi-lowliner/

[111] See, Draft RIA at 35; See also, Bloomberg, Silicon Valley Startup Charts a Path to Cheaper Batteries (Feb. 22, 2023) *available at* https://www.bloomberg.com/news/articles/2023-02-22/silicon-valley-startup-charts-a-path-to-cheaper-ev-batteries?cmpid=BBD022223_hyperdrive&utm_medium=email&utm_source=newsletter&utm_term=230222&utm_campaign=hyperdrive

[112] Ark Invest, Lithium Iron Phosphate Could Take 47% of the Battery Market By 2026 (July 29, 2022) *available at* https://ark-invest.com/articles/analyst-research/lithium-iron-phosphate-batteries/

[113] BloombergNEF, Electric Vehicle Outlook 2023, Executive Summary (June 8, 2023) at 9 *available at* https://about.bnef.com/electric-vehicle-outlook/https://about.bnef.com/electric-vehicle-outlook/

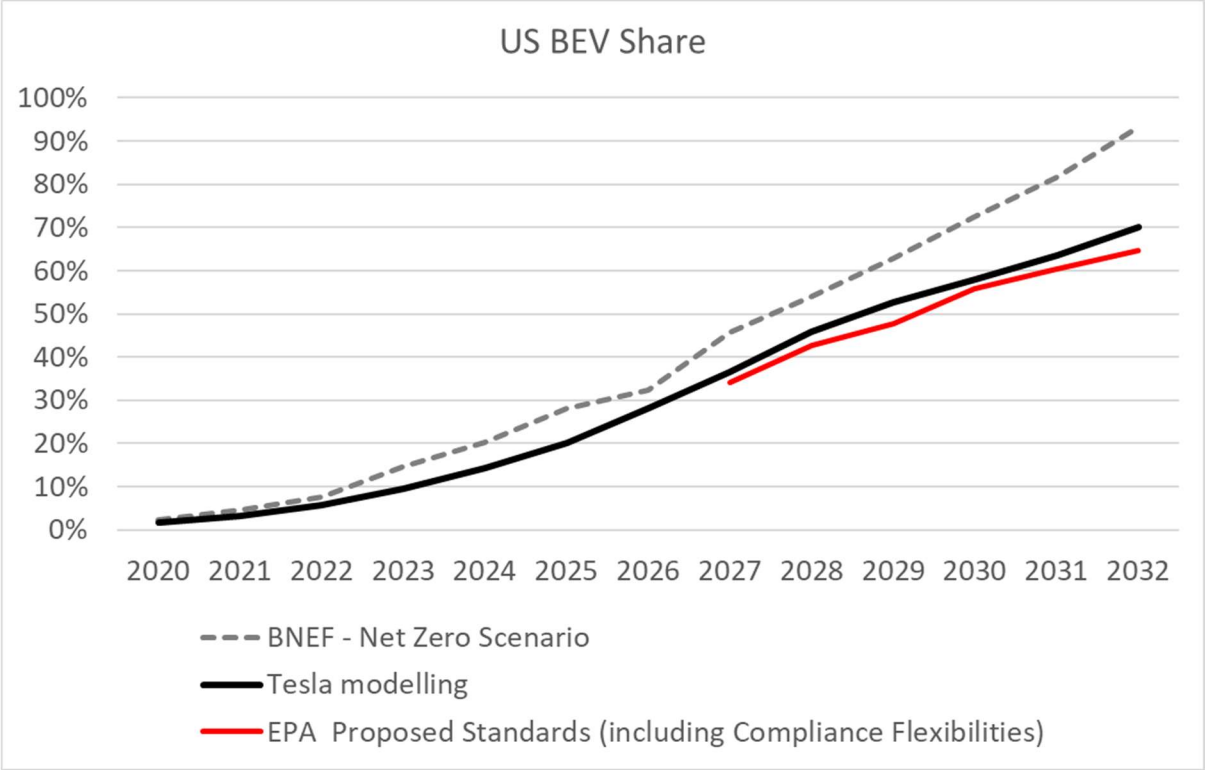
[114] See generally, IEA, Trends in batteries (2023) (analyzing other battery chemistries) *available at* https://www.iea.org/reports/global-ev-outlook-2023/trends-in-batteries

Tesla welcomes the EPA's proposal to reduce GHG emission standards across the light- and medium- fleet and to adjust the footprint-based standards curves to reduce incentives to upsize vehicles.[115] Further, Tesla encourages the agency to quickly implement more stringent emissions standards for light- duty vehicles, and to finalize standards well-before the end of the calendar year.

Tesla believes that more stringent standards can appropriately set the pathway to encourage widespread deployment of BEVs and establish a fleet-wide light-duty vehicle standard of 0 g/mi CO2 starting in MY 2030 (i.e., 100% EV sales by 2030). While the agency has not proposed this level of stringency, several factors favor EPA's ability to set a standard that is more stringent than the proposed Alternative 1. Further, Tesla encourages EPA to design these multipollutant standards so that the remaining combustion-fired portion of the fleet is not allowed to have its emissions backslide either by diluting the overall fleet emissions level targets and continuing a technologically antiquated and environmentally harmful pathway, or by relaxing the emissions reduction progress that ICE vehicles will be required to achieve.

First, Tesla modelling points toward a significant overcompliance with the existing MY 2023-26 standards. Tesla's internal modeling projects 28% ZEV sales in MY 2026. See *Figure 2 – Projected U.S. BEV Market Share*. This represents an 11% over EPA's earlier predicted MY 2026 ZEV sales level (17%) resulting from the amendments to the MY 2023-26 standards.[116] Indeed, there are 206 different BEVs announced for the market in 2027. See *Figure 3 – BEV Model Availability in the U.S.* Thus, this expected overcompliance carries into future model years as Tesla projects business as usual BEV market share sales to be above those projected by EPA under its proposal. See *Figure 2 – Projected U.S. BEV Market Share*.

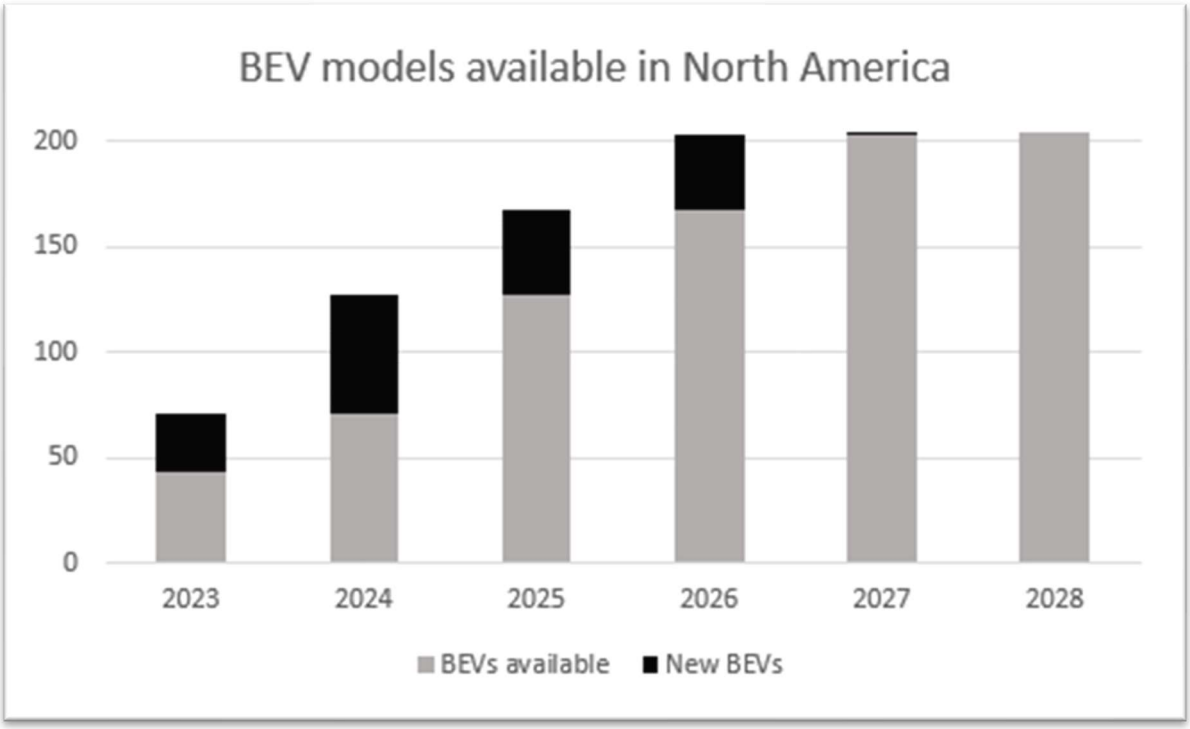
Figure 2 – Projected U.S. BEV Market Share



[115] 88 Fed. Reg. at 29196.

[116] EPA, EPA Finalizes Greenhouse Gas Standards for Passenger Vehicles, Paving Way for a Zero-Emissions Future (Dec. 20, 2021) *available at* https://www.epa.gov/newsreleases/epa-finalizes-greenhouse-gas-standards-passenger-vehicles-paving-way-zero-emissions

Figure 3 – BEV Model Availability in the U.S.



Second, the overcompliance with the existing standards should be a precursor to the EPA's modelling of the proposed alternatives. The agency's own modelling shows significant overcompliance with both the proposed standard and Alternative 1 in MY 2032. EPA indicates the proposed standard results in a cumulative credit surplus of over 36.8M Mg representing almost 1.6M BEVs that will not be sold.[117] See *Figure 4. EPA's Projected Credit Surpluses in MY 2032.*

Similarly, the agency finds that Alternative 1 still results in a credit surplus of over 18.5M Mg.[118] As provide in Figure 4, this credit surplus represents the credit value of approximately 1.3M BEVs that would not be sold over the 2027-32 period.[119] See *Figure 4. EPA's Projected Credit Surpluses in MY 2032.* This oversupply of credits in My 2032 indicates that manufacturers have the capability to comply with a standard that is more stringent than Alternative 1.

[117] Draft RIA at 13-13, Table 13-23. See EPA, The 2022 EPA Automotive Trends Report (Dec. 2022) at 79 (calculation utilizing conversion table to back out production Annual Implied Missing BEVs = (Net credits * 1,000,000) / (Tesla Annual 2027-2032 Weighted g/mi Target * Weighted VMT)).
[118] Id., at 13-17, Table 13-30.
[119] See, footnote 117.

Figure 4. EPA's Projected Credit Surpluses in MY 2032

	2027	2028	2029	2030	2031	2032	2027-32	*Notes*
Est. BEV target (g/mi)	161	140	118	108	98	87		
EPA Proposed Standards								
Credit surplus/deficit	-2,657,934	4,903,857	11,511,560	16,023,002	4,877,793	2,219,523	36,877,801	*Table 13-23*
Equivalent BEVs	-76,456	162,607	453,095	687,091	230,517	118,606	**1,575,460**	
EPA Alternative 1								
Credit surplus/deficit	-31,764,987	-1,002,599	4,211,404	34,980,115	8,379,664	3,769,259	18,572,856	*Table 13-30*
Equivalent BEVs	-913,724	-33,245	165,761	1,500,001	396,010	201,420	**1,316,223**	

Third, the agency's production modelling underestimated BEV production levels on several fronts. Foremost, the modeling significantly underestimates Tesla vehicle sales and projects them out at less 100,000 vehicles per year. See *Figure 5. EPA's Under Projections of Tesla's Implied U.S. Sales MY 2027-2032.* This under projection is inexplicable, unjustified, and needlessly undermines the stringency of the rule, as the Tesla Model Y was just recognized as the world's best-selling vehicle, and second to only the Ford F-150 in the U.S.[120] In 2022, Tesla's U.S. sales already approached 500,000 vehicles.[121] Further, at Tesla's 2022 shareholder meeting, the company has established a goal of producing 20M vehicles globally by 2030.[122] While this goal does not speak to Tesla's annual U.S. sales, the agency's modelling already vastly underestimates Tesla's current and future sales. This data should be updated to recognize both Tesla's current market status and the ambition of Tesla's future ramp of U.S. sales during the MY 2027-2032 timeframe. To address this under projection, Tesla has confidentially provided production and sales estimates to EPA. See *Appendix I, submitted as CBI.*

Figure 5. EPA's Under Projections of Tesla's Implied U.S. Sales MY 2027-2032

	2027	2028	2029	2030	2031	2032
EPA Proposed Standards (Table 13-18/19) - Projected GHG Targets (Mg)						
PC	2,216,521	1,937,768	1,679,457	1,537,450	1,425,760	1,253,596
LT	433,602	377,300	322,947	293,310	267,304	234,225
EPA Proposed Standards (Table 13-1/2) - Projected GHG Targets						
PC	137	119	101	92	84	74
LT	173	150	126	116	105	93
Implied vehicle sales						
PC	82,857	83,394	85,158	85,584	86,925	86,757
LT	11,097	11,136	11,348	11,195	11,271	11,151
Total Tesla volumes	**93,954**	**94,530**	**96,506**	**96,779**	**98,196**	**97,908**

[120] See, Yahoo Finance, Tesla Model Y was the best-selling car worldwide in the first quarter (May 30, 2023) *available at* https://finance.yahoo.com/news/tesla-model-y-was-the-best-selling-car-worldwide-in-the-first-quarter-154909234.html; Inside EVs, Tesla Model Y Second Only To Ford F-150 As Best-Selling Vehicle In US (June 19, 2023) ("Data from *Experian* picked up by *Automotive News* show that Tesla's best-selling model doubled registrations to 127,541 in the first four months of 2023 over last year. Remarkably, the Model Y was the second most popular vehicle of any kind in the US after only the Ford F-150 pickup truck, which posted almost 240,000 sales during the period.") *available at* https://insideevs.com/news/672690/tesla-model-y-second-only-ford-f-150-best-selling-vehicle-us/

[121] See, GoodCarBadCar.Com, Tesla Sales Figures – US Market (showing 2022 sales at 540,000) *available at* https://www.goodcarbadcar.net/tesla-us-sales-figures/

[122] See, Tesla Impact Report 2022 at 64; See also, Reuters, Analysis: Musk's bold goal of selling 20 million EVs could cost Tesla billions (Aug. 30, 2022) *available at* https://www.reuters.com/technology/musks-bold-goal-selling-20-mln-evs-could-cost-tesla-billions-2022-08-30/

Fourth, the agency has not included projected U.S. sales volumes, and ramp of such sales, from a number of emerging BEV-only manufacturers, including Rivian, Lucid, VinFast. Nio, and Fisker. Estimates of the combined U.S. sales from these BEV manufacturers range from almost 234,000 vehicles in 2026 to just under 340,000 in 2032. See *Figure 6. Projected North American BEV-Only OEM Sales (Non-Tesla)*. Combined with the aforementioned severe under projections of Tesla sales, this oversight further results in the agency significantly underestimating the projected volume of BEV sales, under calculating the potential buildup of the overall credit bank available for compliance and, when correctly considered, leads to supporting increasing the stringency of the proposal.

Figure 6. Projected North American BEV-Only OEM Sales (Non-Tesla)

NA Sales for BEV-only OEMS	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2023-32
Fisker Inc.	1,830	30,677	40,035	50,202	63,593	74,841	74,841	74,841	74,841	74,841	560,542
Lucid Motors	6,134	24,404	57,163	103,868	131,005	154,381	154,381	154,381	154,381	154,381	1,094,479
NIO Inc.	1,921	7,177	10,005	10,559	15,314	18,046	18,046	18,046	18,046	18,046	135,206
Rivian Automotive	30,805	38,714	38,334	66,720	76,568	90,230	90,230	90,230	90,230	90,230	702,291
VinFast	4,400	10,660	23,784	28,600	33,540	39,525	39,525	39,525	39,525	39,525	298,609
Total NA Sales	45,090	111,632	169,321	259,949	320,020	377,023	377,023	377,023	377,023	377,023	2,791,127
Estimated US Sales*	**40,581**	**100,469**	**152,389**	**233,954**	**288,018**	**339,321**	**339,321**	**339,321**	**339,321**	**339,321**	**2,512,014**

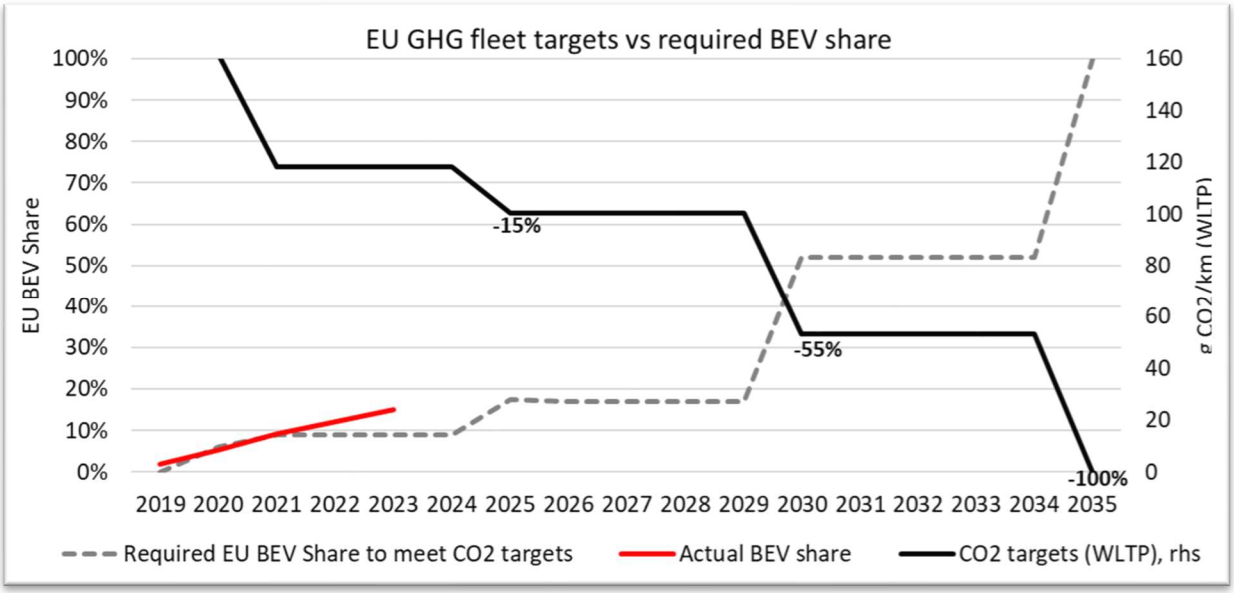
** Assume US Sales are 90% of North American forecast*

Source: EV Volumes North American sales forecasts 2023-2028

Fifth, despite the proposal being a significant advancement in BEV deployment and GHG reductions, the end results are still that the U.S. falls short of the standards set in other major vehicle markets. Indeed, other regions and countries have implemented and/or proposed performance standards that establish decarbonization trajectories that are markedly more aggressive than the EPA's proposal. Despite being the world's second largest vehicle market, the U.S. still lags dramatically behind other countries in both EV fleet penetration and the stringency of the performance standards that advance the deployment of advanced technology vehicles. Even Alternative 1 results in EV deployment levels below those of the GHG emission standards established in the E.U. and China.[123] See *Figure 7. E.U. GHG Fleet Targets and Required BEV Market Share*. As the only U.S.-based manufacturer of BEVs that exports its vehicles abroad, Tesla believes that increasing the stringency of the current performance-based light-duty standards commensurate with other markets is also essential to ensuring U.S. manufacturers' ability to compete abroad and build greater export markets. Ensuring stringent long-term U.S. standards will create further stability and an investment environment that propels domestic manufacturers like Tesla to invest continually in technology and to expand manufacturing for both the U.S. and foreign EV markets. Finalizing a standard that is more stringent than Alternative 1 is a necessary precondition to ensuring the U.S. market remains competitive.

[123] See, ICCT, Infrastructure and Supply Chains Won't Hold Up EPA's Proposed Light And Medium-Duty Vehicle Standards (Apr. 26, 2023) *available at* https://theicct.org/infrastructure-and-supepas-proposed-ldv-mdv-standards-apr23/

Figure 7. E.U. GHG Fleet Targets and Required BEV Market Share



Taken together, these elements all point toward the record basis for the EPA to finalize a light-duty performance standard more stringent than Alternative 1. To that end, Tesla encourages the agency to amend the proposed grams/mi emission standards to exceed the stringency levels (10 g/mi lower than the proposed standard) proposed in Alternative 1 to ensure that BEV deployment reaches levels consistent with firmly establishing U.S. leadership in mobile source GHG emission reductions.

B. Legal Authority

The Clean Air Act (CAA), and Section 202(a), is directed at protecting public health and welfare. *See* 42 U.S.C. § 7401 (identifying the Act's purpose as to "protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population."); 42 U.S.C. § 7521(a)(1) (providing that the Administrator shall prescribe and from time to time revise "standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines, which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare."). The Proposed Rule recognizes that the purpose of adopting standards under CAA section 202 is to address air pollution that may reasonably be anticipated to endanger public health and welfare. Indeed, as EPA notes, "Since the earliest days of the CAA, Congress has emphasized that the goal of section 202 is to address air quality hazards from motor vehicles, not to simply reduce emissions from internal combustion engines to the extent feasible."[124] As courts have recognized, given the overriding goal of the statute to protect public health and welfare, EPA may "plac[e] primary significance on the 'greatest degree of emission reduction achievable,'" and consider other factors such as "cost . . . energy and safety factors as important but secondary factors."[125]

[124] 88 Fed. Reg. at 29233.
[125] *Husqvarna AB v. EPA*, 254 F.3d 195, 200 (D.C. Cir. 2001).

Further, there should be no doubt, in view of recent amendments to the Clean Air Act and Congressional ratification accomplished by the IRA,[126] that EPA has ample authority to address the regulation of greenhouse gas pollutants, from motor vehicles, through electrification, and in the light-duty sector.[127]

Tesla believes that this proposed rule -- in substance and structure -- is firmly in the mainstream of long and well-established agency motor vehicle emissions standard setting activities, and well within industry expectations and the agency's authorities. Indeed, the agency has deployed fleet averaging approaches for decades to provide manufacturers flexibility while increasing the stringency of motor vehicle emissions standards.[128] And it has addressed GHG emissions and criteria pollutants in doing so since 2010.[129] EPA's action has been rooted in the Clean Air Act's textual recognition that EPA is to set and revise standards controlling emissions from vehicles, "whether such vehicles and engines are designed as complete systems or incorporate devices to prevent or control such pollution."[130]

In addition, EPA has, for example, repeatedly expressed its own understanding that GHG standards should be viewed as a strategy to help control criteria pollutants to address National Ambient Air Quality Standards (NAAQS) nonattainment, as well as to address the climate crisis. EPA has previously explained that "[c]limate change is expected to increase regional ozone pollution, with associated risks in respiratory illnesses and premature death."[131] Whether through its impact on reducing atmospheric temperatures that contribute to the formation of ozone, or through its direct impact on air quality by lowering or eliminating *altogether* tailpipe emissions of smog-forming pollutants and PM, enhanced BEV recognition in the development of these requirements will have a significant impact on achieving air quality targets.[132]

Furthermore, the seemingly sharp former distinctions between regulatory strategies to address criteria pollutant emissions and GHG emissions have continued to erode in view of the appropriate control strategies and technologies and the increasingly smaller margins for improvement from conventional ICE emissions. States have noted that zero emission vehicles (ZEVs) produce no tailpipe emissions, reduce brake wear PM emissions, and have lower upstream emissions to contribute to their State Implementation Plan (SIP) strategies.[133] EPA's 2017 Tier 3 standards, for example, achieved reductions of methane (CH_4) and nitrous oxide (N_2O), each of which are GHGs that were part of EPA's endangerment finding.[134]

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[126] Pub. L. No. 117-169, 136 Stat. 1818 (2022).

[127] See, Greg Dotson and Dustin J. Maghamfar, The Clean Air Act Amendments of 2022: Clean Air, Climate Change, and the Inflation Reduction Act, 53 ELR 10017 at 10019, 10032 (2023) (discussing Clean Air Act sec. 137 and other revisions) *available at* https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4338903

[128] See, e.g., 45 Fed. Reg. 79382-83 (Nov. 28, 1980); *Nat. Res. Defense Council v. Thomas,* 805 F.2d 410, 425-26 (D.C. Cir. 1986).

[129] 75 Fed. Reg. 25324 (May 7, 2010) (Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Final Rule for MY 2011 and later).

[130] 42 U.S.C. § 7521(a)(1).

[131] Endangerment Finding, 74 Fed. Reg. at 66525 ("There is now consistent evidence from models and observations that 21st century climate change will worsen summertime surface ozone in polluted regions of North America compared to a future with no climate change."); (While ozone "is a local or regional air pollution problem, the impacts of global climate change can nevertheless exacerbate this local air pollution problem.")

[132] Nonattainment for conventional pollutants such as NOx is also significantly affected by upstream fuel impacts from refinery emissions that are reduced or eliminated by a conversion to zero emissions vehicles. See California Air Resources Board, Analysis in Support of Comments on the SAFE Rule at 69, *available at* https://www.edf.org/sites/default/files/CARB_Detailed_Comments_on_SAFE_NPRM.pdf.

[133] See e.g., CARB, Staff Report: Initial Statement of Reasons (Oct. 22, 2019) at 5, Table ES-1: Expected Emission Reductions of Proposed ACT Regulation Calendar Year (NOx (tpd) PM2.5 (tpd) WTW GHG (MMT/yr.) 2031 5.0 0.16 0.4 2040 16.9 0.46 1.7 (Proposed Rule)) *available at* https://ww3.arb.ca.gov/regact/2019/act2019/isor.pdf

[134] 79 Fed. Reg. at 23445.

EPA has previously recognized the importance of this harmonization. In promulgating its Tier 3 motor vehicle emissions standards, for example, the agency noted:

> The Tier 3 program addresses interactions with the 2017 LD GHG rule in a manner that aligns implementation of the two actions, to achieve significant criteria pollutant and GHG emissions reductions while providing regulatory certainty and compliance efficiency. As vehicle manufacturers introduce new vehicle platforms for compliance with the GHG standards, they will be able to design them for compliance with the Tier 3 standards at the same time.[135]

Given the continuing need for emissions reductions in both the criteria pollutant and the GHG arenas and the increasing capabilities presented by advanced technologies, the multi-pollutant standards EPA is proposing are fully expected by automotive manufacturers, appropriate, and essential. Indeed, the Supreme Court has broadly defined emissions "standards" under the Clean Air Act as including instances where fleet ZEV standards were sought to be enforced.[136] The Court explained that:

> The criteria referred to in §209(a) relate to the emission characteristics of a vehicle or engine. To meet them the vehicle or engine must not emit more than a certain amount of a given pollutant, must be equipped with a certain type of pollution-control device, or must have some other design feature related to the control of emissions.[137]

Certainly zero emissions technology capabilities are such a design feature, and should be factored into the overall fleet performance that manufacturers must meet.

Likewise, other courts have held that full ZEV programs are appropriately considered to be standards under the Clean Air Act:

> To be sure, the ZEV sales requirement does not impose precise overall quantitative limits on levels of emissions, as do the classification system and fleet averages. It mandates only that a specified percentage of the cars sold by a manufacturer in any model year be ZEVs. Nevertheless, the ZEV sales requirement must be considered a standard 'relating to the control of emissions.' ZEV, after all, stands for 'zero-emission vehicle,' and a requirement that a particular percentage of vehicle sales be ZEVs has no purpose other than to effect a general reduction in emissions.[138]

If such a percentage designation of zero emissions vehicle targets is permissible under the Clean Air Act, EPA's approach merely incorporating consideration of that technology is *a fortiorari* an appropriate emissions standard setting exercise of authority.

Nor is it a particularly large conceptual leap from EPA's well-established embrace of overall fleet emissions averages,[139] a practice which has long departed from strict pollutant-by-pollutant numerical limits, to the concept of addressing such emissions at the federal level by recognizing the possibility that an increasingly large proportion of BEVs may become part of a manufacturer's compliance strategy and should be factored into the overall level of permissible emissions. As technology has evolved, the overriding Clean Air Act statutory command to set standards that reflect the greatest degree of emission reduction achievable through the application of such available technology, is fully consistent with this approach.

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[135] 79 Fed. Reg. at 23417.
[136] *Engine Mfrs. Ass'n v. S. Coast Air Quality Mgmt. Dist.,* 541 U.S. 246, 258 (2004).
[137] Id.
[138] *Am. Auto Mfrs. Ass'n v. Cahill,* 152 F.3d 196, 200 (2d Cir. 1998); *Ass'n of Int'l Auto. Mfrs. v. Comm'r*, 208 F.3d 1, 6 (1st Cir. 2000)
[139] See, e.g., 79 Fed. Reg. at 451 (EPA adoption of sales-weighted fleet averages for its Tier 3 emissions regulations).

Further, as a growing number of states seek to adopt more robust ZEV requirements, enhancing the ZEV contribution to the establishment of multi-pollutant standards has the potential to significantly enhance nationwide regulatory and market uniformity. Tesla, as do many other manufacturers, strongly supports furthering as much national uniformity as is possible while still acknowledging California and the Section 177 States' innovation and leadership.[140]

Furthermore, the time frames for which these standards are being now proposed and will be set are ones that are perfectly appropriate under the Act. As we have repeatedly noted in comments to the Agency, auto manufacturers have acknowledged that, "integrating technologies that improve fuel economy across multiple product lines requires several years of lead time and a substantial investment of capital and engineering resources."[141] Further, "once a vehicle redesign incorporating a new vehicle technology is planned, [i]t takes a significant amount of time to retool a factory and smoothly validate the tooling and processes to mass produce a replacement technology."[142] It is critical that the rules be set now, which will provide the regulatory certainty that companies need to make these investments.

VI. Stringency and Specific Aspects of the Proposal

For the U.S. to meet its decarbonization goals and to mitigate the public health and welfare impacts from climate change, EPA's proposal should be amended to meet increasingly more stringent regulatory requirements that incentivize all vehicle manufacturers to rapidly scale up delivery of high-quality BEVs.

The Clean Air Act is designed to be "technology-forcing" and light- and medium-duty manufacturers are poised to meet significant new emission reduction performance standards.[143] The Clean Air Act is "intended to be a 'drastic remedy to . . . a serious and otherwise uncheckable problem.' . . . Subsequent legislative history confirms that the technology-forcing goals of the 1970 amendments are still paramount in today's Act."[144] As courts have recognized in the specific context of CAA section 202(a)(1) and as the preamble to the proposal appropriately acknowledges, "Congress intended the agency to project future advances in pollution control capability. It was 'expected to press for the development and application of improved technology rather than be limited by that which exists today.'"[145]

Consistent with this approach, EPA appropriately states "While standards promulgated pursuant to CAA section 202(a) are based on application of technology, the statute does not specify a particular technology or technologies that must be used to set such standards; rather, Congress has authorized and directed EPA *to adapt its standards to emerging technologies.*"[146] Furthermore, as the agency recognizes, "This forward-looking regulatory approach keeps pace with real-world technological developments and comports with Congressional intent."[147]

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[140] See 42 U.S.C § 7507.
[141] Brief of the Association of Global Automakers and the Alliance Of Automobile Manufacturers in Opposition, *Coalition for Responsible Regulation v. EPA,* No. 12-1253 (Sup, Ct,, July 22, 2013) at 4 *available at* http://www.edf.org/sites/default/files/12-1253-Brief-in-Opposition-Auto-Manufacturers.pdf
[142] Id., at 5, *quoting* 75 Fed. Reg. 25324, 25468.
[143] *Union Elec. Co. v. EPA*, 427 U.S. 246, 258 (1976); *Train v. NRDC*, 421 U.S. 60, 90 (1975).
[144] *Whitman v. American Trucking Ass'n,* 531 U.S. 457, 491-92, (Breyer, J. concurring), *citing Union Elec.* 427 U.S. at 256.
[145] *NRDC v. EPA*, 655 F.2d 318, 328 (D.C. Cir. 1981).
[146] 88 Fed. Reg. at 29187 (emphasis added).
[147] Id., at 29232.

Accordingly, to meet strictures and pathway established under section 202, in addition to adopting Alternative 1 with increased stringency, Tesla also asserts that the following amendments to the proposal will result in a more "forward-looking" performance standard providing greater protection to the public health and welfare.

A. EPA Should Fully Eliminate Off-Cycle Credits Staring in Model Year 2027

In the proposal, EPA takes steps to phasedown the amount of allowed off-cycle credits with a declining cap on such credits from MY 2027 through MY 2030, reducing the menu of eligible credits, eliminating the five-cycle pathway, and allowing only ICE vehicles to generate off-cycle credits.[148] While sunsetting off-cycle credits is directionally positive, the agency should instead eliminate all off-cycle credit generation starting in MY 2027.

While reduced, continuing off-cycle crediting creates asymmetry in the regulation favoring ICE vehicles, diverts research and development investment away from the best emissions reduction technology of electrification, and unnecessarily weakens the stringency of the standard.

Ongoing utilization of off-cycle credit in only ICE and PHEV vehicles creates a disparity in the type of vehicles that are rewarded for deploying efficiency technology. Originally created in 2010, the off-cycle menu credits consisted almost entirely of technologies (i.e., Active Engine Warmup, Active Transmission Warmup, Engine Stop Start) applicable ***only*** for use on ICE vehicles. Subsequently, in its 2012 rules, EPA moved forward the timeline for generating these credits from a proposed MY 2017 to MY 2014. As a result, the off-cycle program has its origins in technologies now over thirteen years old. Despite being an antiquated part of the standard, EPA now proposes extending crediting rewards to manufacturers for deploying these technologies for what amounts to another eight model years. This means ongoing off-cycle credits will reduce the stringency of the proposed standard by rewarding many now commonly deployed efficiency technologies that provide, at best, negligible real-world emissions, or technology advancement benefits.

Moreover, previous analysis has shown that manufacturers reliance on off-cycle credits diverts investment and deployment away from the most efficient vehicle technologies. Continuing these credit rewards old technology and, to the extent new technologies are deployed to generate off-cycle credits, focuses critical research and development budgets on tweaking legacy ICE and PHEV platforms rather than directing these budgets to full electrification and greater emissions reductions. In extending the off-cycle program and limiting it to ICE and PHEV vehicles, EPA's proposal half-heartedly confronts this built-in bias toward legacy technology. Especially at a time when manufacturers should be further developing next generation BEV technology and eliminating legacy technology, the agency should not maintain such perverse incentives and should eliminate all off-cycle crediting starting in MY 2027.[149]

B. EPA Rightfully Proposes Revisiting PHEV Utility Factors

While the agency proposes limiting the remaining off-cycle credit generation based on PHEVs fleet utility factor, as discussed above, this still would inequitably favor a legacy technology at the expense of full vehicle electrification.[150] Nevertheless, EPA is appropriately revisiting the PHEV Fleet Utility Factor because PHEV compliance to date has significantly underestimated CO2 emissions by overestimating their use of electricity.[151] Reducing the PHEV utility factor is appropriate and overdue.

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[148] Id., at 29248-929252

[149] See generally, Bloomberg Hyperdrive, Carmakers Start to Starve Combustion Models Out of Existence (July 11, 2022) *available at* https://www.bloomberg.com/news/articles/2022-07-08/carmakers-start-to-starve-combustion-models-out-of-existence?cmpid=BBD070822_hyperdrive&utm_medium=email&utm_source=newsletter&utm_term=220708&utm_campaign=hyperdrive

[150] 88 Fed. Reg. at 29251.

[151] Id., at 29252.

PHEVs have consistently been overrewarded compared to their actual emissions reduction performance.[152] In a 2020 study, the International Council on Clean Transportation (ICCT) found that real-world PHEV fuel consumption and emissions were about 2-4 times higher than certified levels.[153] According to ICCT, one of the main reasons for this is that, "For private cars, the average utility factor (UF)—an expression for the portion of kilometers driven on electric motor versus kilometers driven on combustion engine—is 69% for New European Drive Cycle (NEDC) type approval but only around 37% for real-world driving. For company cars, an average UF of 63% for NEDC and approximately 20% for real-world driving was found."[154] Essentially, PHEV drivers utilize ICE engines for travel far more than electric drive when operated in real world conditions. Similarly, Transport and Environment found that emissions from three of the most popular PHEVs in the EU were 28-89% higher than certified levels even under ideal test conditions (e.g., fully charged battery).[155] Other studies suggest hybrids offer little benefit compared to ICE vehicles.[156] The California Air Resources Board (CARB) has also recognized these concerns by calling out excessive PHEV cold start emissions.[157] In sum, Tesla supports the agency revisiting the PHEV Fleet Utility Factor.

C. EPA Rightfully Ends the A/C Leakage Crediting

Reducing short-lived climate pollutant emissions, such as HFC-134a, is a critical step toward mitigating climate change. Accordingly, Tesla supports EPA's actions to prohibit high GWP (> 150) refrigerants such as HFC 134a in new light-duty A/C systems post MY-2025.[158] As the proposal recognizes, the transition to lower GWP refrigerants is rapidly underway and all manufacturers can be compliant before the implementation of the proposed standards go into effect. Accordingly, the agency has correctly eliminated the A/C leakage credit.

D. EPA Should Create Parity on A/C Efficiency Crediting

The EPA's decision to limit voluntary A/C efficiency credits to only ICE vehicles is bad policy.[159] In proposing this limitation, the agency runs the risk of creating a disincentive for manufacturers of BEVs to continue to improve and deploy the most efficient cooling systems. The agency instead should consider a technology neutral approach allowing the crediting of all vehicles and increasing the stringency of the overall standard consistent with the additional level of credit generation that will accumulate with BEV A/C efficiency credit generation eligibility.

E. EPA's Continuation of Its Zero Upstream Emissions Approach is Appropriate

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[152] See e.g., Guardian, Major plug-in hybrid cars pollute more than official measures suggest (Feb. 7, 2023) *available at* https://www.theguardian.com/environment/2023/feb/08/major-plug-in-hybrid-cars-pollute-more-than-official-measures-suggest

[153] ICCT, Real-World Usage of Plug-In Hybrid Electric Vehicles: Fuel Consumption, Electric Driving, and CO2 Emissions (Sept. 27, 2020) *available a*t https://theicct.org/publication/real-world-usage-of-plug-in-hybrid-electric-vehicles-fuel-consumption-electric-driving-and-co2-emissions/

[154] Id., at 1.

[155] Transportation & Environment, Fixing the PHEV loophole (Dec. 2021) *available at* https://www.transportenvironment.org/wp-content/uploads/2022/02/2022_TE_position_PHEV_UF_timeline.pdf;See also, CleanTechnica, Plugin Hybrid Cars Pollute 200–400% More Than Official Ratings (Feb. 13, 2022) *available at* https://cleantechnica.com/2022/02/11/phevs-pollute-2-4x-more-than-official-ratings-lets-fix-the-eu-loophole/

[156] See e.g., Impact Living, Study on the consumption of plug-in hybrid vehicles in Valais topography (Jan. 11, 2022) *available at* https://impact-living.ch/wp-content/uploads/2022/01/Consommation-vehicules-hybrides-rapport-publie-IMPACT-LIVING-canton-Valais-11-01-22.pdf

[157] CARB, Advanced Clean Cars (ACC) II Workshop Presentation at 27 (May 6, 2021) *available at* https://ww2.arb.ca.gov/sites/default/files/2021-05/acc2_workshop_slides_may062021_ac.pdf

[158] 88 Fed. Reg. at 29247.

[159] 88 Fed. Reg. at 29239.

Tesla agrees with the agency's decision to continue its approach of not requiring net upstream emissions accounting for BEVs in these standards.[160] As described supra, BEVs represent the best emission reduction technology and have by far the lowest climate impact of any vehicle technology, and, in this regard, should not be treated differently than ICE vehicles. To date, EPA has not gone outside the tailpipe to account for upstream petroleum production or petroleum refinery emissions in setting ICE vehicles emission standards. Instead, the agency has historically sought to addresses these dangerous emissions through separate stationary source regulations.[161] Similarly, in addressing electricity as a vehicle fuel, emissions from electric generating units are otherwise addressed through stationary source regulation.[162] Accordingly, Tesla agrees that "If EPA deviated from this tailpipe emissions approach by including upstream accounting, it would appear appropriate to do so for all vehicles, including gasoline-fueled vehicles."[163]

F. Credit Multipliers Decrease BEV Deployment and Should Not Be Extended or Renewed

Tesla supports the continuing elimination of advanced technology multipliers to ensure overall program integrity. Firmly establishing a one-for-one credit ratio is a more rational and transparent compliance mechanism and creates actual BEV vehicle deployment, thereby enabling deeper emission reduction targets.[164]

Tesla asserts that providing credit multipliers can unnecessarily dampen actual deployment of BEVs and lead to backsliding on emission reductions. This is true regardless of the technology to which a multiplier may be attached and is not applicable just to BEVs. Accordingly, Tesla also supports the agency's proposed elimination of the medium-duty credit multipliers for all ZEVs after MY 2026.[165] Indeed, considering the high level of the current medium-duty multiplier, rather than serve as an incentive, the multiplier is likely to further delay manufacturers from deploying large amounts of medium-duty BEVs in the U.S. until 2027.

G. Tesla Supports EPA's Proposed Changes to the Medium Duty Definition

Tesla supports the agency's proposed definitional changes around medium-duty passenger vehicles.[166] As more electrification takes place across the passenger vehicle fleet, the definitional changes will allow the agency to recognize the increased weight associated with such electrification while ensuring that passenger vehicles are appropriately subject to more stringent passenger-vehicle emissions standards.

H. EPA's Proposed Durability Standards Are Reasonable

Building consumer assurance is a key factor towards achieving significantly higher levels of BEV penetration. Tesla agrees with EPA that consumers should have access to information regarding the state of battery health (SOH), especially those considering the purchase of a used BEV or when filing a warranty claim. As further noted, durability monitoring can ensure emission reduction benefits are met and provide integrity to credit trading.

In providing such information, Tesla has favored a SOH monitor based upon battery capacity because it is directly proportional to vehicle range, depends on the least test conditions, can easily be run with an onboard

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[160] Id., at 29252.
[161] See e.g. EPA, Petroleum Refinery Sector Rule (Risk and Technology Review and New Source Performance Standards) *available a*t https://www.epa.gov/stationary-sources-air-pollution/petroleum-refinery-sector-rule-risk-and-technology-review-and-new; EPA, Clean Air Act Standards and Guidelines for Petroleum Refineries and Distribution Industry *available at* https://www.epa.gov/stationary-sources-air-pollution/clean-air-act-standards-and-guidelines-petroleum-refineries-and
[162] EPA, Greenhouse Gas Standards and Guidelines for Fossil Fuel-Fired Power Plants *available at* https://www.epa.gov/stationary-sources-air-pollution/greenhouse-gas-standards-and-guidelines-fossil-fuel-fired-power
[163] 88 Fed. Reg. at 29252.
[164] Id., at 29197.
[165] Id., at 29244-45.
[166] Id., at 29278-79.

diagnostic procedure, and can be verified with simple measurement equipment. Nonetheless, Tesla recognizes and participated in proceedings developing the UN GTR 22 and agrees with EPA's general adoption of the GTR 22 and a SOH monitor communicating the battery's state of certified energy (SOCE) based upon usable battery energy (UBE).[167] Tesla also supports the agency's decision to not require a state of certified range (SOCR) monitor as development of an accurate SOCR monitor is far more difficult and burdensome than developing an SOCE monitor.[168] Accurate SOCR monitoring would require, among other things, customizing road load test for each vehicle that can be programmed on the dynamometer. Such a testing burden would add significant cost to BEV deployment. Consistent with implementation of an SOH monitor and accuracy testing, Tesla believes the flexibility provided in the monitoring family definition provides assurances to manufacturers that deployment of similar monitors across different vehicle lines does not create any undue or repetitive SOCE testing burdens and cost.

Imposing specific minimum durability performance requirements on BEVs provides no emissions reduction benefit. BEVs do not emit tailpipe (or evaporative) criteria pollutants and changes in battery durability and retained range do not alter this fact. Unlike emission controls in ICE vehicles, BEVs are also not vulnerable to defeat devices and tampering.[169] Requiring durability standards can cause greater tailpipe emissions by harming the rate of BEV uptake through imposition of substantial new costs and designs with reserved battery capacity. Tesla respectfully submits that any speculative benefit from consumer assurance provisions such as minimum performance requirements must be balanced against increased up-front costs on BEVs, which are likely to slow consumer uptake and thereby increase emissions. Moreover, as the DOE has documented, BEV range continues to accelerate as the technology is deployed.[170] As BEV range increases, the loss of incremental battery capacity over time (due to expected degradation) will matter less to consumers.

Nonetheless, Tesla believes the proposed minimum performance requirement (MPR) for the SOH are set at reasonable and achievable levels.[171] Further, the decision not to implement a MPR for Class 2b and 3 will facilitate greater early adoption in those segments. For testing purposes, defining the battery family definition is best served by allowing manufacturers to utilize the criteria mentioned in the proposed regulation such as maximum specified charging power, method of battery thermal management, battery (cathode) chemistry and the net power of the electrical machines.[172] This is far preferred over defining the families based on battery capacity which would create multiple families for the same vehicles with the same battery types and chemistry but different battery capacity. While establishing a 90 percent pass requirement for battery family monitor exceed the passage rates set in the ACC II durability provisions, Tesla agrees with the agency's flexible approach allowing manufacturer to use good engineering judgment in determining the statistically adequate and representative in-use vehicle data for testing.[173]

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[167] Id, at 29285.
[168] Id., at 29288
[169] See e.g.\, Reuters, Stellantis unit to pay $5.6 million to resolve California emissions probe (Oct. 13, 2022) *available at* https://www.reuters.com/business/autos-transportation/stellantis-unit-pay-56-million-resolve-california-emissions-probe-2022-10-13/; Reuters, U.S. Supreme Court rejects Volkswagen appeals over emissions tampering (Nov. 15, 2021) *available at* https://www.reuters.com/business/autos-transportation/us-supreme-court-rejects-volkswagen-appeals-over-emissions-tampering-2021-11-15/; Washington Post, Why Carmaker Cheating Probes Stay in High Gear: QuickTake Q&A (Jan. 10, 2018) *available at* https://www.washingtonpost.com/business/why-carmaker-cheating-probes-stay-in-high-gear-quicktake-qanda/2018/01/10/318b6d5a-f632-11e7-9af7-a50bc3300042_story.html?utm_term=.2315e81e50b4
[170] U.S. DOE, FOTW #1290, May 15, 2023: In Model Year 2022, the Longest-Range EV Reached 520 Miles on a Single Charge (May 15, 2023) *available at* https://www.energy.gov/eere/vehicles/articles/fotw-1290-may-15-2023-model-year-2022-longest-range-ev-reached-520-miles
[171] 88 Fed. Reg. at 29285, Table 64.
[172] Id., at 29288. Tesla notes EPA should provide further guidance of the definition of "net power of electrical machines."
[173] See 13 CCR § 1962.4 (d)

Finally, EPA should not encourage manufacturers to overcome the durability threshold by creating larger batteries with hidden capacity that can slowly be accessed as the battery degrades. Encouraging this approach is fundamentally flawed. BEV customers, just like other light-duty vehicle customers, will have guarantees of performance from the manufacturer. Hidden capacity is adding cost for more performance than what the customer sought in their vehicle, will unnecessarily raise BEV prices, and dampen deployment of the best emissions reduction technology currently available. Encouraging full access to the battery (with reliable SOCE monitoring) allows for maximum utility of deployed products over the entire life - something that is fundamental to the Tesla customer experience and should be incorporated into good public policy. Accordingly, Tesla supports the agency in not requiring over capacity declarations.[174] Requiring reserve capacity declarations could have the perverse effect of communicating unwarranted battery upsizing as beneficial and incent consumers to choose less efficient vehicles-.

I. The Proposed Battery and Component Warranty Should Be Adjusted

Under EPA's proposal, manufacturers would be required to warrant a battery and associated powertrain components are free from defects in materials and workmanship which cause the deterioration of the battery SOH to less than 80% UBE for eight years or 80,000 miles, whichever occurs first, starting MY 2027.[175]

Tesla supports a minimum warranty requirement as it may eliminate low-lifetime battery pack designs and deployment. Tesla notes that the proposed 80% UBE level exceeds the industry norm. If EPA chooses to exceed the current industry standard, most, if not all, OEMs would be unable to avoid significant warranty costs and liability without significant additional costs to each vehicle. These additional warranty costs will be passed on to customers and increase BEV cost, again dampening BEV uptake.

Currently, Tesla warrants a Model 3 real-wheel drive vehicle for 8 years or 100,000 miles, whichever comes first, with minimum 70% retention of battery capacity over the warranty period.[176] As noted, most other OEMs offer similar warranty coverage.[177] Other Tesla vehicle models extend the warranty to either 120,000 or 150,000

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[174] 88 Fed. Reg. at 29286.

[175] Id.

[176] Tesla, New Vehicle Limited Warranty *available at* https://www.tesla.com/support/vehicle-warranty

[177] See e.g., 2022 Ford F-150 Lightning, What is the warranty on the F-150 Lightning? ("Eight years or 100,000 miles (whichever occurs first), with retention of 70% or more of the original High Voltage Battery capacity over that period") *available at* https://www.ford.com/support/how-tos/owner-resources/f-150-lightning/f-150-lightning-product-frequently-asked-questions/#5 ; 2022 Ford Mach-E (" Battery is covered for 8 years or 100,000 ;miles, whichever comes first, retaining a minimum of 70% of its original capacity over that period."); Chevrolet, Living Electric: A simple smart way to drive ("Certain electric propulsion components for Bolt EV and Bolt EUV are covered for 8 years or 100,000 miles*") *available at* https://www.ford.com/suvs/mach-e/; Volkswagen, The all-new 2021 Volkswagen ID.4 electric SUV ("The high-voltage battery is warranted for eight years or 100,000 miles, whichever occurs first, for defects in material and workmanship and for net capacity loss below 70%, and can also be transferred to a subsequent owner throughout the remainder of its duration.") *available at* ; https://media.vw.com/assets/documents/original/13020-2021ID4ReleaseFINAL.pdf; Audi, E-tron "(8 year/100K miles (whichever occurs first) high-voltage battery limited warranty coverage on MY21 Audi E-tron vehicles. Battery capacity decreases with time and use. Warranty coverage may not return battery capacity to an "as new" condition with 100% net capacity. See owner's literature or dealer for limited warranty details.") *available at* https://www.audiusa.com/us/web/en/inside-audi/sustainability/e-tron-innovation/layer/battery_limited_warranty_coverage.html ; See generally, MyEV.com, Evaluating Electric Vehicle Warranties (last visited Feb. 9, 2022) *available at* https://www.myev.com/research/buyers-sellers-advice/evaluating-electric-vehicle-warranties#:~:text=Like%20other%20vehicle%20types%2C%20an,components%2C%20comprehensive%20and%20powertrain%20coverage.&text=Importantly%2C%20federal%20regulations%20mandate%20that,eight%20years%20or%20100%2C000%20miles; U.S. Department of Energy, Fact #913: February 22, 2016 The Most Common Warranty for Plug-In Vehicle Batteries is 8 Years/100,000 Miles (Feb. 22, 2016) *available at* https://www.energy.gov/eere/vehicles/fact-913-february-22-2016-most-common-warranty-plug-vehicle-batteries-8-years100000

miles.[178] The proposed escalating liability to 80% of the SOH of the battery pack will be a consequential requirement and likely add significant costs.

[CBI – [redacted].] Battery pack replacement is much more expensive than ICE replacement of an emissions control system or transmission. For example, estimates place battery pack replacement and labor in the range from a high end of around $16,000[179] to $5,500.[180] Regardless, if 35% of vehicles were to fail warranty, it represents an average added cost of between $5,600 and $1,925 per car. These figures also do not take into consideration the significant new investment manufacturers will need to make in remanufacturing facilities that seek to repurpose the exchanged battery packs.

Accordingly, Tesla advocates warranty thresholds more consistent with the industry standard and adoption of a standard of 8-year, 80,000 miles warranty with 70% UBE. Battery technology and capacity retention may improve, and Tesla is actively pursuing ways to improve lifetime capacity while also decreasing cost, increasing range and, fast charge performance attributes necessary for the widescale adoption of BEVs.[181] However, estimating the precise trajectories of this research and development and technological breakthroughs and deployment more than five years out is extremely difficult and should not serve as a basis for an overly prescriptive warranty requirement.

J. BEVs Continue to Be the Most Effective NMOG+ NOx Emission Reduction Technology

An overarching goal of the proposed emission standards regime should be to continue to design them in a manner that incents, accelerates, and rewards the deployment of the best performing vehicles. As noted previously, BEVs represent the best vehicle technology for eliminating tailpipe criteria air pollutants. Tesla believes that the agency should continue to recognize BEVs for this best- in-class performance and the emission reduction contributions. Accordingly, Tesla supports EPA's decision to maintain ZEVs in the baseline of the NMOG + NOx emissions standards.[182] Failure to continue this approach would unfairly penalize BEVs by eliminating their NMOG credit generation and the incentive for ZEV adoption that averaging, banking, and trading creates.

VII. Lead Time and Rapid Deployment Mean Other Factors Are Not Barriers to More Stringent Standards

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[178] Id.

[179] See, Recurrent, Costs of Electric Car Battery Replacement *available at* https://www.recurrentauto.com/research/costs-ev-battery-replacement

[180] Consumer Report, Pay Less for Vehicle Maintenance with an EV (Sept. 26, 2020) *available at* https://www.consumerreports.org/car-repair-maintenance/pay-less-for-vehicle-maintenance-with-an-ev/

[181] Tesla also continues to make significant investments in advancing EV, solar, and battery storage technology with over $1.1B dedicated to research and development in 2021 alone. See Tesla, SEC Form 10-K (Jan. 26, 2022) at 39 *available at* https://www.sec.gov/Archives/edgar/data/1318605/000156459021004599/tsla-10k_20201231.htm;
See also, InsideEVs, Tesla Spends Least On Ads, Most On R&D: Report (Mar. 25, 2022)(reporting that Tesla spends $2,984 per car on R&D and that such spending is three times the industry average and higher than Chrysler, Ford, and GM's R&D budgets combined) *available at* https://insideevs.com/news/575848/tesla-highest-research-development-no-ads/?utm_source=feedburner&utm_medium=email

[182] 88 Fed. Reg. at 29257.

While Section 202(a) directs the agency to have the proposed emission standards take effect after such period found necessary to permit the development and application of the requisite technology, these considerations must take place under the same technology forcing context utilized in assessing the vehicle technology. Under this rubric, any assessment of BEV charging infrastructure adequacy should not, based upon the extensive record available to the agency, dampen the agency's move forward with a more a stringent standard. First and foremost, all levels of light-duty BEV charging utilize proven and demonstrably effective technology that have been applied for years. Second, economics dictate that increased build out of charging infrastructure follows deployment of BEVs, as without adequate vehicles on the road investment in such infrastructure risks becoming a stranded asset. Third, new charging technologies and solutions will continue to develop.[183]

At the outset, nothing in the statute directs EPA to give great weight to infrastructure or similar considerations in evaluating whether a standard can be implemented in a time period the Administrator finds sufficient "to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period."[184] This is in contrast to other portions of the statute, which specifically direct the agency to consider, for example, "the impact of renewable fuels on the infrastructure of the United States, including deliverability of materials, goods, and products other than renewable fuel, and the sufficiency of infrastructure to deliver and use renewable fuel."[185]

In any event, deployment of adequate charging infrastructure is already, and will be, available commensurate with the rate of BEV uptake supported by more stringent rules than the agency proposes. EPA's analysis of this issue should focus on when the standards come into effect: to the extent EPA has authority to consider infrastructure issues, it would be under its authority to have the regulation take effect "after such period as the Administrator finds necessary to permit the development *and application* of the requisite technology,"[186] which necessarily entails a predictive judgment about what the infrastructure capacities would be in the future (including in response to the proposed rule), rather than being limited to the status quo. For example, in the past EPA has considered whether technology would "would be perfected early enough to allow its mass production and installation."[187]

While the proposal focuses its attention on non-residential charging, the agency should more robustly recognize the role of residential charging.[188] In the U.S. there are approximately 82 million single family homes most of which are a capable of providing Level 1 and 2 BEV charging.[189] As DOE indicates 80% of EV charging is done at home due to the convenience and low cost of residential charging and strategies for addressing the increase in electricity demand are readily available.[190] Further, as the EPA notes, the IRA's extension of the Alternative Fuel Refueling Property Tax Credit through Dec 31, 2032, will support individual home owners investment in significantly expanding residential charging.[191]

Additionally, the agency unduly dampens the rate of Level 3 charging deployment by utilizing cost estimates for DCFC installation that are dramatically higher than Tesla's experience. Tesla has established the lowest cost in

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[183] See, S&P Global, EV Chargers: How many do we need? (Jan. 9, 2023) (discussing battery swapping, wireless charging, and increased deployment of DC wallbox solutions) *available at* https://press.spglobal.com/2023-01-09-EV-Chargers-How-many-do-we-need
[184] 42 U.S.C. § 7521(a)(2).
[185] 42 U.S.C. § 7545(*o*)(2)(B)(ii)(IV).
[186] 42 U.S.C. § 7521(a)(2) (emphasis added).
[187] *NRDC v. EPA*, 655 F.2d 318, 324 (D.C. Cir. 1981).
[188] See, 88 Fed. Reg. at 29307; Draft RIA at 5-22 thru 5-39.
[189] See, Statista, U.S. Single family homes - statistics & facts (Feb. 20, 2023) *available at* https://www.statista.com/topics/5144/single-family-homes-in-the-us/#topicOverview
[190] See e.g., NREL, Incorporating Residential Smart Electric Vehicle Charging in Home Energy Management Systems (April 7, 2021) *available at* https://www.nrel.gov/docs/fy21osti/78540.pdf
[191] See, Draft RIA at 5-26.

the industry and shown the costs to be more than 50% below current industry averages.[192] EPA utilizes a mid-range DCFC cost of $153,000 per charging port for a 250 kW DCFC port. In comparison, Tesla costs are under $40,000 per deployed DCFC port.[193] This overestimation of the cost of deployment indicates that the agency underestimates the volume of DCFC that can be deployed based on expected investment levels. Importantly, EPA should recognize, as Tesla's figures exemplify, that non-utility ownership of BEV charging stations is associated with significantly reduced cost of installation.[194] Further, charging technology, like vehicle technology, is also maturing as more suppliers and manufacturing facilities are coming online and the cost of installation will continue to decline.[195]

A. Rapid and Expansive Investment in Charging Infrastructure Supports Stringent Multi-Pollutant Light-Duty Emission Standards

As EPA notes, investments in BEV charging infrastructure have grown rapidly in recent years and will continue to accelerate.[196] Moreover, a number of new Congressionally enacted policies will also facilitate greater and rapid deployment of charging infrastructure sufficient to support more robust light-duty standards.[197] The Bipartisan Infrastructure Law (IIJA) bipartisan infrastructure and investment and jobs act invests $7.5 billion to build out the first-ever national network of EV chargers. IIJA also created the Charging and Fueling Infrastructure Discretionary Grant Program to deploy publicly accessible charging and fueling infrastructure and provides for $2.5 billion over five years for the program.[198] At the end of March 2023, FHWA issued a notice of funding opportunity to solicit applications for grants totaling up to $700 million to deploy charging and alternative fueling infrastructure projects. Half of the $700 million is allocated for electric vehicle and other infrastructure located on public roads or in other publicly accessible locations, while the other half is allocated for charging and alternative fueling infrastructure located along designated alternative fuel corridors.

In addition to the federal investments in charging facilitated by the IIJA, the IRA's Section 30C provides significant tax incentives for the deployment of private capital into charging infrastructure for both light and heavy-duty vehicles.[199] It allows for up to $100,000 for each charger with no limit on how many chargers a fleet can purchase and install at one site; this will drive significant new private investment. Similarly, tax incentives for building efficiency will also benefit EV charging installations.[200] PWC recently predicted that the BEV charging

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[192] Tesla, 2023 Investor Day Presentation (March 1, 2023) at 97 – 101.
[193] Id., at 97; See also, See Grid Strategies/Electric Serving Customers Best: The Benefits of Competitive Electric Vehicle Charging Stations (May 2023) at Table 3 (showing calculations for average cost per EV charging port by company) *available at* https://www.electricadvisorsconsulting.com/wp-content/uploads/2023/05/The-Benefits-of-Competitive-EV-Charging-Stations.pdf
[194] See, Grid Strategies/Electric Serving Customers Best: The Benefits of Competitive Electric Vehicle Charging Stations (May 2023) at Table 3 (showing calculations for average cost per EV charging port by company) *available at* https://www.electricadvisorsconsulting.com/wp-content/uploads/2023/05/The-Benefits-of-Competitive-EV-Charging-Stations.pdf
[195] See, 2023 Tesla Investor Day Presentation at 99 (showing a 40% Improvement in Per kWh Costs between Q1 2021 and Q4 2022); See also, ABB, ABB expands US manufacturing footprint with investment in new EV charger facility (Sept. 14, 2023) *available at* https://new.abb.com/news/detail/94725/abb-expands-us-manufacturing-footprint-with-investment-in-new-ev-charger-facility; See also, Tritium, Tritium Celebrates the Opening of Its First Global EV Fast Charger Manufacturing Facility in the United States (Aug. 23, 2022) *available at* https://tritiumcharging.com/tritium-celebrates-the-opening-of-its-first-global-ev-fast-charger-manufacturing-facility-in-the-united-states/
[196] 88 Fed. Reg. at 29194.
[197] 88 Fed. Reg. 29195; Draft RIA at 5-25 thru 5-26.
[198] Infrastructure Investment and Jobs Act, P.L 117-58 (Nov. 15, 2021), Section 11401.
[199] Id. at Section 13404.
[200] See Credit Suisse, Treeprint: US Inflation Reduction Act - A Tipping Point in Climate Action, at (2022) *available at* https://www.credit-suisse.com/about-us-news/en/articles/news-and-expertise/us-inflation-reduction-act-a-catalyst-for-climate-action-202211.html

market will grow ten-fold by 2030.[201] Another new analysis establishes BEV charger annual installed capacity will overtake distributed solar for the first time in 2023 and will reach 41 GW by 2027 and the BEV charging infrastructure market will reach US $20 billion by 2027, led by the residential Level 2 (US $6.5 billion) and public DC fast-chargers (US $5.6 billion) segments.[202] Further, the International Energy Agency (IEA), in its 2022 Trends in Charging Infrastructure study, reported that already "the United States counts about 22,000 fast chargers, of which nearly 60% are Tesla superchargers."[203] Notably, Tesla plans to double the size of our Supercharging network in the next 18-24 months.[204] Other automakers are following in Tesla's footsteps and entering into EV charging partnerships and investments as well.[205] Similarly, fossil fuel companies are reorienting investment around BEV infrastructure.[206] Investment in charging infrastructure will be further enhanced by state rebates and incentive programs. Numerous incentives that will also facilitate new charging infrastructure have been established and enacted.[207]

B. Utility Rate Design Reform Will Spur Greater Infrastructure Investment

Additionally, utility investment in grid infrastructure to support EV charging will accrue over the next several years, as evidenced by active proceedings in many jurisdictions.[208] As part of this investment, addressing utility demand charges will also play a role in facilitating the expansion of charging infrastructure.[209] The combination of low load factors with high demand charges can result in uneconomic operation of charging stations and

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[201] PWC, The US electric vehicle charging market could grow nearly tenfold by 2030: How will we get there? (2023) *available at* https://www.pwc.com/us/en/industries/industrial-products/library/electric-vehicle-charging-market-growth.html

[202] Wood MacKenzie US Distributed Energy Resource market to almost double by 2027 (June 20, 2023) *available at* https://www.woodmac.com/press-releases/us-distributed-energy-resource-market-to-almost-double-by-2027/

[203] IEA, Trends in charging infrastructure (2022) *available at* https://www.iea.org/reports/global-ev-outlook-2022/trends-in-charging-infrastructure

[204] TechCrunch, Tesla agrees to double supercharger network, open to all EVs under Biden's $7.5B charging plan (Feb. 15, 2023) (discussing other charging investments as well) *available at* https://techcrunch.com/2023/02/15/tesla-agrees-to-double-supercharger-network-open-to-all-evs-under-bidens-7-5b-charging-plan/

[205] See e.g., Bloomberg, Jeep Maker Stellantis Sets Up EV Charging Unit to Soothe Range Anxiety (June 27, 2023) *available at* https://www.bloomberg.com/news/articles/2023-06-27/jeep-maker-stellantis-sets-up-ev-charging-unit-to-soothe-range-anxiety#xj4y7vzkg; Bloomberg, Car-Charging Investment Soars, Driven by EV Growth and Government Funds (Aug. 16, 2022) *available at* https://www.bloomberg.com/news/articles/2022-08-16/car-charging-investment-soars-driven-by-ev-growth-and-government-funds?cmpid=BBD081622_hyperdrive&utm_medium=email&utm_source=newsletter&utm_term=220816&utm_campaign=hyperdrive#xj4y7vzkg; Charged, FLO to provide up to 40,000 public chargers for GM's Dealer Community Charging Program (Dec. 10, 2022) *available at* https://chargedevs.com/newswire/flo-to-provide-up-to-40000-public-chargers-for-gms-dealer-community-charging-program/?utm_source=ChargedEVs.com+Email+Newsletter+Opt-in&utm_campaign=f221ea7628-Daily+Headlines+RSS+Email+Campaign&utm_medium=email&utm_term=0_6c05923d39-f221ea7628-343935020

[206] See e.g., BP, bp leans into convenience and mobility across US, agrees to purchase leading travel center operator, TravelCenters of America (Feb. 16, 2023) *available at* https://www.bp.com/en/global/corporate/news-and-insights/press-releases/bp-agrees-to-purchase-travelcenters-of-america.html

[207] See generally, N.C. Clean Energy Technology Center (NCCETC), The 50 States of Electric Vehicles: State ZEV Targets, Managed Charging, & LMI Access Prioritized in 2022 (Feb. 8, 2023) *available at* https://nccleantech.ncsu.edu/2023/02/08/the-50-states-of-electric-vehicles-state-zev-targets-managed-charging-lmi-access-prioritized-in-2022/

[208] See e.g., New York State Department of Public Service, Proceeding on Motion of the Commission Regarding Electric Vehicle Supply Equipment and Infrastructure, Case No. 18-E-0138 *available at* https://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=18-E-0138&CaseSearch=Search

[209] See, Alliance for Transportation Electrification, Rate Design for DC Fast Charging: Demand Charges (May 2022) *available at* https://evtransportationalliance.org/wp-content/uploads/2022/06/Rate.Design.TF_.Demand-Charge-Paper-Final-5.25.22.pdf

stymies investment in charging infrastructure in otherwise promising markets where electrification is growing. EPA should recognize that this issue is changing with many utilities now proposing or already having implemented novel approaches to mitigate the impact of demand charges and encouraging time of use rates to facilitate further proactive investments in charging infrastructure.[210] Moreover, since BEV charging stations are large upfront investments assessed over a long-time horizon, the longer-term certainty provided in many of these rate reform proceedings will drive greater infrastructure investment. A number of utility proceedings have already addressed these issues including the following:

- Illinois Commerce Commission Docket No. 20-0170 – In the Matter of Ameren Illinois Company d/b/a Ameren Illinois's Proposed Creation of Rider Optional Vehicle Charging Program ("Rider EVCP").
- Oregon Public Utilities Commission Docket No. UE 374 – In the Matter of Pacificorp d/b/a Pacific Power Request for a General Rate Revision
- New Jersey Board of Public Utilities Docket No. EO18101111 – In the Matter of the Petition of Public Service Electric and Gas Company for Approval of its Clean Energy Future – Electric Vehicle and Energy Storage ("CEF-EVES") Program on a Regulated Basis
- Colorado Public Utilities Commission Proceeding No. 21AL-0494E – In the Matter of Advice No. 1867-Electric Filed by Public Service Company of Colorado to Revise Its PUC No. 8-Electric Tariff and to Add Schedule S-EV-CPP and Implement Changes to Schedules S-EV, EVC, and TEPA, to be Effective on Thirty-Days' Notice
- Massachusetts Department of Public Utilities Docket # 21-90 – Petition of NSTAR Electric Company d/b/a Eversource Energy for approval of its Phase II Electric Vehicle Infrastructure Program and Electric Vehicle Demand Charge Alternative Proposal
- Illinois Commerce Commission Docket No. 22-0432 Petition for Approval of Beneficial Electrification Plan under the Electric Vehicle Act, 20 ILCS 627/45 and New EV Charging Delivery Classes under the Public Utilities Act, Article IX
- New York PSC's Case No. 22-E-0236 Proceeding to Establish Alternatives to Traditional Demand-Based Rate Structures for Commercial Electric Vehicle Charging.

Additional proceedings addressing these issues will help further facilitate investment and deployment of charging infrastructure, supporting the agency's adoption of a more ambitious light-duty standards.

C. The Critical Mineral Supply Chain and the Battery Supply Chain Are Not Limiting Factors in Light-Duty BEV Deployment

Similar to infrastructure, Clean Air Act Section 202 does not direct EPA to consider upstream resource availability in promulgating standards, and so this is a factor that need not be given undue weight. More importantly, Tesla does not believe that the critical minerals and battery supply chains will constrain future U.S. manufacturing and deployment of BEVs in any vehicle class.[211] There are no fundamental materials constraints when evaluating against 2023 USGS estimated resources.[212] Such assertions assume (wrongly) that reserves are fixed and declining. In fact, mineral resources and reserves have historically increased – that is, when a mineral is in demand, there is more incentive to look for it and more is discovered. In comparison, to the extent that current

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[210] Utility Dive, With looming EV load spikes, PG&E, Duke, other utilities adopt new rate design and cost recovery strategies (Apr. 18, 2023) *available at* https://www.utilitydive.com/news/electric-vehicle-load-spikes-pge-duke-sce-entergy-aps-dynamic-rate-design-reduced-demand-charges/646603/?utm_source=Sailthru&utm_medium=email&utm_campaign=Issue:%202023-04-21%20Utility%20Dive%20Newsletter%20%5Bissue:49850%5D&utm_term=Utility%20Dive

[211] See, 88 Fed. Reg. at 29312

[212] See, Tesla, 2023 Investor Day Presentation (March 1, 2023) at 28.

critical minerals reserves are viewed as limiting, the agency should point to the long history of "Peak Oil" and how such predictions have never in themselves limited deployment of ICE vehicles.[213]

While appropriately assessing the critical minerals supply chain associated with BEVs, EPA should also note it has never undertaken the same assessment related to ICE vehicles. A sustainable energy economy actually involves a lower level of mineral extraction than a fossil fuel-based economy.[214] For example, the U.S. oil and gas sector has long been dependent on critical minerals from China for use in oil and gas exploration and development drilling.[215] The petroleum industry's reliance on barite has even been used as a case study on U.S. critical minerals dependence.[216] Indeed, the American Petroleum Institute has been so concerned about dwindling global reserves that it altered the specifications for the type of barite used in oil and gas drilling.[217] At no point has the EPA found that this supply chain constraint has impacted the fuel supply for ICE light-duty vehicles or impacted such vehicles' viability for deployment.[218] Accordingly, to the extent such conditions are found in the battery supply chain, it should be anticipated that they neither diminish the viability of light-duty BEV technology nor will limit BEV deployment volumes to meet a stringent emission standard that exceeds Alternative 1.

Regardless, the significant and growing investment in the battery supply chain and manufacturing capacity and Tesla's own significant responsible sourcing efforts ensure that BEV deployment will not be limited during the proposed standard's MY 2027-2032 period. As the IEA recently found, the strong investment in BEV and energy storage will double in 2023 to $30 billion (from 2022) and has already led to a wave of new lithium-ion battery manufacturing projects around the world totaling an estimated 5.2 TWh of new capacity that could be available by 2030.[219] This has already led overall investment in critical mineral development to increase 30% in 2022, including a 50% increase in lithium resource development followed by similar focuses on copper and nickel

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[213] See e.g., Forbes, Peak Oil: The Perennial Prophecy That Went Wrong (Nov. 30, 2022) *available at* https://www.forbes.com/sites/arielcohen/2022/11/30/peak-oil-the-perennial-prophecy-that-went-wrong/?sh=c64aabb2bbe5

[214] Tesla, Master Plan Part 3 at 31-36 *available at* https://www.tesla.com/blog/master-plan-part-3https://www.tesla.com/blog/master-plan-part-3

[215] See, U.S. House of Representatives, Committee on Resources, Subcommittee on Energy and Mineral Resources, Oversight Hearing on ``U.S. Energy and Mineral Needs, Security and Policy: Impacts of Sustained Increases in Global Energy and Mineral Consumption by Emerging Economies Such as China And India" (March 16, 2005), Statement of W. David Menzie, Geologist, U.S. Geological Survey ("There are a significant source of a number of mineral commodities for which the U.S. is dependent for imports of its supplies, and these include things like antimony, barite, fluorspar, magnesium and there are things that are used in batteries, ceramics, electronic components, flame retardants, metallurgical processing and petroleum drilling.") *available at* https://www.govinfo.gov/content/pkg/CHRG-109hhrg20126/html/CHRG-109hhrg20126.htm

[216] U.S. Geological Survey, "Barite—A Case Study of Import Reliance on an Essential Material for Oil and Gas Exploration and Development Drilling" *available at* https://pubs.usgs.gov/sir/2014/5230/pdf/sir2014-5230.pdf; See also, U.S. Government Accountability Office, Hardrock Mining: Trends in U.S. Reliance on Imports for Selected Minerals (Apr. 30, 2019) at 3, *available at* https://www.gao.gov/products/gao-19-434rhttps://www.gao.gov/products/gao-19-434r

[217] U.S. Geological Survey, Mineral Commodity Summaries 2020 at 29 ("In response to concerns about dwindling global reserves of 4.2-specific-gravity barite used by the oil and gas drilling industry, the American Petroleum Institute issued an alternate specification for 4.1-specific-gravity barite in 2010.) *available at* https://pubs.usgs.gov/periodicals/mcs2020/mcs2020.pdf

[218] It should be noted that the oil and gas industry's supply chain reliance and constraints have been exemplified by its continued lobbying for exemptions from the Section 301 tariffs for steel and other inputs said to be key to the industry. See e.g., Independent Petroleum Association of America, Steel and Aluminum Tariffs & *Quotas available at* https://www.ipaa.org/tariffs/https://www.ipaa.org/tariffs/ (highlighting supply chain dependence); Daily Energy Insider, API calls for oil, gas industry exemptions from steel tariffs (may 22, 2018) *available at* https://dailyenergyinsider.com/news/12579-api-calls-oil-gas-industry-exemptions-steel-tariffs/

[219] IEA, World Energy Investment 2023 (May 25, 2023) *available at* https://www.iea.org/reports/world-energy-investment-2023

development.[220] This expansion is occurring and is expanding so fast that battery manufacturing capacity is now on track to meet the 2030 milestones set out in the IEA's scenario to achieve net zero CO2 emissions by 2050.[221]

Similarly, the IRA's domestic critical mineral processing and battery manufacturing incentives have led to exponential levels of investment in the battery supply chain.[222] In early 2023, it was already estimated that there were $210 billion of announced domestic BEV manufacturing investments.[223] This expansion is also happening globally with over $300 billion of announced investment in new battery gigafactories since 2019.[224] The U.S. expansion is occurring so rapidly it is already exceeding official government forecasts.[225] An ongoing tally of this investment shows that these investments are happening throughout the U.S.[226]

D. Tesla Development of a Robust, Secure Critical Minerals Supply Chain

As extensively detailed in Tesla's Impact Report 2022, Tesla's efforts to expand this supply chain are also accompanied with a commitment to ensuring that companies in our supply chain respect human rights and protect the environment.[227] In every location touched by Tesla's supply chain, the company seeks to ensure local conditions for stakeholders are continuously improving as a result of the company's investment and sourcing decisions. This commitment is further detailed in our publicly available Responsible Sourcing Policy, Human Rights Policy, and Supplier Code of Conduct.[228] These policies and our supply chain due diligence efforts are aligned with the United Nations Guiding Principles on Business and Human Rights[229] and the Organization for Economic Cooperation and Development (OECD)'s Due Diligence Guidance for Responsible Business Conduct.[230]

To that end, Tesla has taken significant steps to establish and develop a robust supply chain that will support its future deployment of its light-duty vehicles consistent with the production and deployment estimates Tesla has previously shared with the agency. More specifically, this has included developing and expanding its vertical integration up the supply chain to include expanded cell production, build out of a new cathode production facility at Gigafactory Texas, and breaking ground on the most technologically advanced lithium processing

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[220] Id., at 104
[221] Bloomberg, Solar, Battery Boom Puts Net Zero Path in Reach: Sparklines (May 25, 2023) *available at* https://www.bgov.com/next/news/RV7L4BT0G1KWhttps://www.bgov.com/next/news/RV7L4BT0G1KW
[222] Infrastructure Investment and Jobs Act, P.L 117-58 (Nov. 15, 2021), Section 13502.
[223] Atlas EV Hub, $210 Billion of Announced Investments in Electric Vehicle Manufacturing Headed for the U.S. (Jan. 12, 2023) *available at* https://www.atlasevhub.com/data_story/210-billion-of-announced-investments-in-electric-vehicle-manufacturing-headed-for-the-u-s/?utm_source=Center+for+Climate+and+Energy+Solutions+newsletter+list&utm_campaign=7093a6e673-EMAIL_CAMPAIGN_2022_04_29_03_23_COPY_01&utm_medium=email&utm_term=0_36e5120ca4-7093a6e673-303640237
[224] Charged, Billions of bucks for US battery plants announced in 2022 (Jan. 12, 2023) *available at* https://chargedevs.com/newswire/billions-of-bucks-for-us-battery-plants-announced-in-2022/
[225] See generally, Bloomberg, Goldman Sees Biden's Clean-Energy Law Costing US $1.2 Trillion (March 23, 2023) *available at* https://www.bloomberg.com/news/articles/2023-03-23/goldman-sees-biden-s-clean-energy-law-costing-us-1-2-trillion#xj4y7vzkg; See also, Semafor, How Washington underestimated Biden's big climate law (May 4, 2023) *available at* https://www.semafor.com/article/05/04/2023/biden-climate-ira-cost-inflation-reduction-act
[226] See, Charged, Update: U.S. Electric Vehicle Supply Chain IRA + 288 Days *available at* https://www.charged-the-book.com/na-ev-supply-chain-maphttps://www.charged-the-book.com/na-ev-supply-chain-map (last visited May 31, 2023)
[227] Tesla, Impact Reports 2022: A Sustainable Future Is Within Reach at 139 -185 (describing Tesla's extensive responsible sourcing efforts) *available at* https://www.tesla.com/impact
[228] Tesla, Responsible Sourcing Policies *available at* https://www.tesla.com/legal/additional-resources#responsible-sourcing-policies
[229] United Nations, Office of the High Commissioner, Human Rights (2011) *available at* https://www.ohchr.org/sites/default/files/documents/publications/guidingprinciplesbusinesshr_en.pdf
[230] OECD, Due Diligence Guidance for Responsible Business Conduct *available at* https://www.oecd.org/investment/due-diligence-guidance-for-responsible-business-conduct.htm

facility in Corpus Christi.[231] The blueprint for this activity was originally unveiled during Tesla's Battery Day announcement.[232]

Consistent with the Administration's focus on critical minerals, Tesla has continued to focus on creating a secure and sustainable supply chain anchored with domestic sources.[233] To that end, following its Battery Day announcement, Tesla established an off-take agreement for a domestic source of lithium with plans to process the lithium hydroxide and manufacture cathode material in the U.S. – creating a first-ever wholly North American upstream advanced battery supply chain. [234] Additionally, Tesla continues to support partnerships for domestic mineral production, establishing supply agreements for North America production from Free Trade Agreement countries.[235] Similarly, Tesla has worked to develop commercial relationships with companies onshoring critical mineral processing.[236]

EPA should also consider that recycling of battery material will play a vital role in alleviating some pressure on the need to develop new critical mineral resources. To that end, Tesla seeks to reduce its reliance on primary mined materials and contribute to a more positive environmental footprint through battery and cell recycling – including ensuring that none of our batteries (manufacturing scrap or fleet returns) go to landfills and deploying equipment to recycle 100% of on-site generated manufacturing scrap across manufacturing facilities. In comparison to BEV batteries, it should also be noted the energy source for ICE vehicles – fossil fuels used in combustion – is not recyclable.

Finally, in furtherance of this effort, Tesla is also supporting other emerging domestic suppliers in the advanced battery supply chain as they seek developmental support through various DOE programs, including the Critical Minerals Mining Research and Development Program[237] and the Advanced Technology Vehicle Manufacturing program.[238]

Conclusion

Tesla believes the changes described herein -- which are amply supported, and indeed compelled, by the record before the agency -- will significantly reduce emissions, result in increased deployment of the best available

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[231] Tesla, Tesla Lithium Refinery Groundbreaking (May 8, 2023) *available at* https://www.tesla.com/blog/tesla-lithium-refinery-groundbreaking

[232] Tesla, Battery Day Presentation (Sept. 22, 2020) *available at* https://www.tesla.com/2020shareholdermeeting

[233] Tesla Impact Report 2022 at 139 -185.

[234] Piedmont Lithium, Piedmont Lithium Amends Agreement with Tesla (Jan. 3, 2023) *available at* https://piedmontlithium.com/piedmont-lithium-amends-agreement-with-tesla/

[235] See, Bloomberg, Tesla Strikes Battery-Metal Deal in Push to Ensure Supply (Jan. 10, 2022) *available at* https://www.bloomberg.com/news/articles/2022-01-10/tesla-talon-enter-into-nickel-concentrate-supply-agreement#xj4y7vzkg; See e.g., BHP enters into nickel supply agreement with Tesla Inc (July 28. 2021) *available at* https://www.bhp.com/news/media-centre/releases/2021/07/bhp-enters-into-nickel-supply-agreement-with-tesla-inc; Reuters, Australia's Liontown signs 5-year lithium supply deal with Tesla (Feb. 15., 2022) *available at* https://www.reuters.com/business/australias-liontown-signs-5-year-lithium-supply-deal-with-tesla-2022-02-15/

[236] See, Magnis, Magnis Signs Offtake Agreement for North American Anode Active Material Production (Feb. 20, 2023) *available at* https://magnis.com.au/asx-announcements/https://magnis.com.au/asx-announcements/; Canary Media, DOE backs US battery materials production with $107M loan (April 18, 2022) (describing Tesla's agreement with Syrah for domestic graphite production) *available at* https://www.canarymedia.com/articles/batteries/doe-backs-us-battery-materials-production-with-107m-loan

[237] See generally, White House, FACT SHEET: Biden-Harris Administration Driving U.S. Battery Manufacturing and Good-Paying Jobs (Oct. 19, 2022) *available at* https://www.whitehouse.gov/briefing-room/statements-releases/2022/10/19/fact-sheet-biden-harris-administration-driving-u-s-battery-manufacturing-and-good-paying-jobs/

[238] See 85 Fed Reg 77202 (Dec. 1, 2020) (providing notice, *inter alia*, that the ATVM Program broadly to encourages applications from potential projects involving the production, manufacture, recycling, processing, recovery, or reuse of Critical Minerals and other minerals.).

light-duty emissions reduction technology (BEVs), maintain U.S. manufacturing leadership in BEV technology, and ensure the Administration is meeting its statutory mandate to protect the public health and welfare from the significant and accelerating impacts from air pollution and climate change.

Accordingly, for the reasons set forth above, the EPA should, *inter alia*, amend its proposal to adopt a final standard that embodies a more stringent version of Alternative 1.

Respectfully submitted,

Joseph Mendelson III
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Public Policy & Business Development

Attach.

Appendix 1 – Tesla Actual/Projected U.S. Light Duty Vehicle Manufacturing MY 2017- 2030e (submitted as confidential business information).