



PLUGGED IN

AN EV NEWSLETTER

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Editor's Notes

We are pleased to introduce a recurring addition to our newsletter titled “In Case You Missed It.” We will be providing a summary of recent informative and thought provoking articles and/or videos appearing in the media relating to the EV transition and providing some commentary/perspective on the content. We hope you will check it out.

Rasika Kulkarni | Editor and Associate Attorney

EPA Proposes Multi-Pollutant Emissions Standards in Light of Massive ZEV Investment and Incentives

On April 12, 2023, the US Environmental Protection Agency (USEPA) issued new proposed regulations that, if adopted in the proposed form, will mandate reduced emissions from light- and medium-duty vehicles, such as passenger cars and pickup trucks.¹ The regulations tighten restrictions on emissions of greenhouse gas (GHGs), hydrocarbons, nitrogen oxides, and fine particulate matter (PM_{2.5}). The new limits are intended to recognize the significant emissions reductions resulting from auto manufacturers’ move away from internal combustion engines

¹ See “Multi-Pollutant Emission Standards for Model Years 2027 and Later Light-Duty and Medium –Duty Vehicles,” 88 FR 29184, May 5, 2023. Note that similar regulations mandating reductions in GHG emissions from heavy duty vehicles have been proposed in a separate, parallel rulemaking. See “GHG Emission Standards for Heavy-Duty Vehicles - Phase 3, 88 FR 23388, April 17, 2023.

(ICE) to zero emission vehicle (ZEV) technologies and, in particular, the massive increase in electric vehicles (EVs) in automaker product lines. The rulemaking also recognizes the incentives under the Bipartisan Infrastructure Law (BIL) and the Inflation Reduction Act (IRA), which encourage further investment in zero emission vehicles and supporting infrastructure to further support these objectives.

Promulgated under Section 202 of the CAA, the proposed rules set standards for passenger cars and light-duty and medium-duty trucks (primarily large pickups and vans) for model years 2027 through 2032. The proposed rules are intended to build upon the emissions reductions achieved under existing regulations by achieving further reductions in emissions over the course of model years 2023 through 2026. In support of its determination that additional emissions reductions are appropriate, the preamble states, “Recent trends and developments in emissions control technology, including vehicle electrification and other advanced vehicle technologies, indicate that more stringent emissions standards are feasible at reasonable cost and would achieve significant improvements in public health and welfare.”²

The proposed rules do not mandate that auto manufacturers take a specific approach for achieving the emission reduction objectives; rather, it gives them the flexibility to determine the appropriate mix of technologies to be employed across their fleets to achieve the mandated emissions reductions.

EPA’s feasibility analysis supporting the rule is premised upon the expectation that the trend toward increasing adoption of ZEVs will increase. The regulations assume widespread implementation of currently available technologies, particularly electrification technologies, including battery-electric vehicles (BEVs), hybrid electric vehicles (HEVs), and plug-in hybrid electric vehicles (PHEVs), as well as further advances in developing and deploying new technologies.

Mandated Emissions Reductions. The proposed rules set GHG standards that increase in stringency each year over a 6-year period from MY 2027 – 2032. The regulations would result in an industrywide average target for a light duty fleet of 82 grams/mile of CO₂ in MY 2032, representing a 56 percent reduction in projected fleet average GHG emissions targets when compared to MY 2026 standards.

² 88 FR at 21186.

For medium-duty vehicles, the proposal would result in a combined average target of 275 grams/mile of CO₂ by MY 2032, representing a 44 percent reduction in fleet average GHG emissions target levels when compared to the current MY 2026 standards.

In the proposal, EPA is also seeking comments on three proposed alternative emissions levels for GHG emissions, with varying levels of stringency, and varying schedules for achievement of milestones. EPA also seeks comments on whether the standards should continue to increase in stringency in future years beyond 2032.

While auto manufacturers have flexibility in choosing how they will achieve the mandated reductions, achievement of the target emissions levels will necessarily require the automakers to be successful in their efforts to achieve widespread adoption of ZEVs, particularly battery electric vehicles. For example, the rulemaking notes that one pathway for meeting the proposed standards would be for an auto manufacturer to achieve the following:

- Achieve a 68 percent BEV fleet penetration rates by MY 2032 across the combined passenger car, crossover/SUV, and pickup truck categories, including a 78 percent penetration rate for sedans;
- Achieve a 46 percent BEV penetration by 2032 across the medium-duty van and pickup truck categories, including a 98 percent penetration rate for vans and a 19 percent penetration rate for heavy duty pickups;
- Implement widespread use of gasoline particulate filters for ICE vehicles to reduce PM emissions; and
- Implement improved technologies to reduce CO₂ from conventional gasoline ICE vehicles.

The proposed rule also establishes more stringent limitations for criteria pollutants, including non-methane organic gases (NMOG) and nitrogen oxides (NO_x), representing a 60 percent reduction in permitted emissions for light duty vehicles, and a 66 to 76 percent reduction for medium duty vehicles by 2032. For particulate matter, the proposed rules would require both light- and medium-duty vehicles to achieve emissions level that constitute a 95 percent reduction when compared to current emissions levels by 2032. EPA states that these reductions could be achieved “[t]hrough the application of readily available emissions control technology.”³ Reducing particulate would also reduce emissions of air toxics.

³ See 88 FR at 29197.

Cost/Benefit Analysis. EPA’s cost benefit analysis concludes that the rule will result in substantial net benefits of \$850 billion to \$1.6 trillion, with annualized net benefits between \$60 billion and \$280 billion. Climate benefits are estimated to be \$330 billion. Net health benefits are estimated to be between \$63 billion and \$280 billion, with the vast majority of health benefits coming from the projected reduction in particulate matter emissions. The proposal is also expected to benefit environmental justice communities close to transportation corridors that are disproportionately impacted by air pollution from vehicles.

Interestingly, the cost/benefit analysis concludes that consumers will achieve significant savings by transitioning to BEVs. While implementation of the regulations is estimated to increase the cost of a vehicle by \$1,200, the increase is estimated to be more than offset by the savings in operating costs, including reduced fuel costs and reduced maintenance and repair costs, resulting in a projected savings of \$9,000 per vehicle over an 8-year period.

Author’s Take

With proposed emissions targets representing fleet-wide reductions in GHG emissions of 56% for light duty vehicles and 44% for medium duty vehicles when compared to 2026 levels, the regulations as proposed require massive reductions in GHG emissions. As noted, achievement of these objectives may require as much as a 68% BEV fleet penetration rate for light duty vehicles by MY 2032, including as much as a 78% penetration rate for sedans. While the targets may be technically achievable, lots of things will have to go right for manufacturers to reach these objectives. Because these are regulatory emissions limits, not merely aspirational targets, compliance is mandated by law, and failure to achieve them will result in legal consequences.

Further, pursuing such a comprehensive transformation of the transportation sector necessarily has broader implications for related aspects of the economy, such as the supply chain and the electric grid, which could impose restrictions on the ability of automakers to meet these objectives that are outside their control. The proposal acknowledges some these concerns, with the preamble discussing potential issues regarding the supply of critical minerals, mineral production capacity, and battery production capacity.⁴ While the preamble acknowledges the need to address these issues, no specific plan for doing so is discussed.

⁴ See 88 FR 29312 et seq., addressing “Supply Chain, Manufacturing and Mineral Security Considerations.”

The public comment period on the proposed rules is currently open, and comments can be submitted through July 5, 2023 at www.regulations.gov in docket EPA-HQ-OAR-2022-0829.

Kevin G. Desharnais | Member

In Case You Missed It

In this edition of “In Case You Missed It,” we provide links and commentary to two interesting articles addressing various challenges to the critical rare-earth material supply chain, one about a controversial projection of a \$2,000 share price of Tesla by 2027 and a link to a video interview discussing the extraordinary level of investment in EV manufacturing facilities in the U.S. Enjoy!

[The Underbelly of Electric Vehicles: What goes into making EVs, where it comes from and at what human cost](#) (April 27th edition of *The Washington Post*)

The author acknowledges the benefit of the projected material reduction in emissions from transportation resulting from the rapid transition to EV vehicles, which represents 14% of the global total emissions each year; but asks the reader to consider the offsetting “significant human and environmental toll” resulting from the mining and processing of the minerals used in the battery manufacturing process. The author notes that the five minerals most critical to EV batteries: Bauxite, Nickel, Manganese, Cobalt and Lithium are concentrated in just a handful of countries and suggests that “...the environmental, social and workplace challenges...have yet to be addressed.” The article contains interesting information and statistics, though merely scratches the surface of the potential negative implications of the rapid transition.

[The U.S. Wants Rare-Earths Supply Chain. Here’s Why It won’t Come Easily.](#) (April 25th edition of Wall Street Journal)

Much has been written and discussed regarding the critical importance of Rare Earth Materials to the rapid transition to EVs. Questions abound - Exactly what are these “rare-earth materials?” Where are the major deposits of these materials and processing facilities located? How are they used in the battery manufacturing process? What are some of the major challenges in timely accessing and in sufficient quantities to meet the extraordinary requirements to allow for the projected rapid transition to EVs?

The above article appearing in a late April edition of the *Wall Street Journal* attempts to address these and other questions. Reading the article won't make you an expert on the rare-earth materials supply chain; but it will likely make you more knowledgeable and focused regarding this complicated and critically important part of the EV manufacturing supply chain.

[ARK's Expected Value for Tesla in 2027: \\$2,000 per share.](#) (April 20th edition of *ARK Invest*)

ARK Investment Management LLC, which focuses on disruptive innovation companies, primarily in the public equity markets and has a large position in Tesla in its portfolio, recently published a report targeting the price of a share of Tesla to be \$2,000 by 2027. As of May 1st, Tesla was trading at approximately \$162 per share. Above is a link to ARK's report. As you will note, the primary factor justifying the eye popping projected valuation is Tesla's prospective robotaxi business line, which ARK projects will contribute 67% of expected enterprise value and 64% of expected EBITDA in 2027. Pretty heady estimates for a business line that has not sold any vehicles to date. There is a fair amount of skepticism regarding ARK's projections, with a multitude of obstacles to overcome to meet the adoption rate underlying the estimate. To name a few, competition in the space (Waymo and others), rider acceptance, regulatory approvals, etc. No matter what your perspective, the report is an interesting read.

[CNBC Interview: "I've never seen this kind of EV investment"](#) (April 10th on CNBC)

Dennis Cuneo, former GM and Toyota executive and currently president of DC Strategic Advisors, was recently interviewed on CNBC's "Squawk Box." DC Strategic Advisors advises companies seeking to build new automotive facilities in the U.S. Mr. Cuneo addresses the hyper state of investment in U.S. EV manufacturing facilities. A short, but informative, overview of the scope and breadth of the massive ongoing investment in EV manufacturing and underlying catalysts.

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