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July 3, 2023

Via online submission at www.regulations.gov

U.S. Environmental Protection Agency (EPA)
Office of Air and Radiation
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Re: Docket ID No. EPA-HQ-OAR-2022-0829, Proposed Rule: Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles

Chevron appreciates the opportunity to review and comment on the referenced proposed rule. Chevron is a major refiner and marketer of petroleum and renewable products in the U.S. This proposed rule directly affects Chevron's transportation fuel business and customers.

Chevron is committed to providing affordable, reliable, and ever-cleaner energy to our customers. We support technology neutral policies at the federal level that drive greenhouse gas (GHG) emission reductions in the transportation sector. Chevron is collaborating with vehicle manufacturers, fuel producers, and agricultural partners to develop market-based and cost-effective solutions to meet the GHG reduction challenge.

The light and medium duty rule proposes a tailpipe standard designed to force the use of technology that may not be supported adequately by nationwide infrastructure investments or consumer adoption of the battery electric vehicles. As an alternative, we encourage EPA to consider an approach that utilizes a full lifecycle assessment of all technology and fuel types that reduce GHG emissions from the fleet of new and older in-use vehicles covered under this proposed rule. This strategy will likely result in far more GHG emission reductions than a solution that only includes a technology forcing tailpipe standard for new vehicles.

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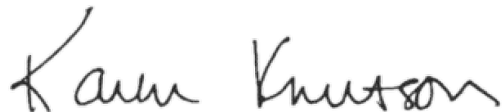
Our comments are organized in five categories:

1. Lifecycle GHG based standards,
2. The need for a broad technology approach,
3. The role of biofuels,
4. Feasibility and implementation, and
5. Potential future fuel controls

Chevron is a member of American Petroleum Institute (API), American Fuel and Petrochemical Manufacturers (AFPM), Clean Fuels Alliance America (CFAA), and other trade groups. Throughout our comments we will be endorsing views on specific topics to amplify the comments provided by these industry trade associations.

Thank you for providing this opportunity to comment on the proposed rule. If you have any questions regarding our comments, please contact Bob Anderson (bob.anderson@chevron.com, 925-842-5317), Ezra Finkin (ezra.finkin@chevron.com, 515-766-8448), or Jason Larrabee (jasonlarrabee@chevron.com, 202-408-5853).

Sincerely,

A handwritten signature in black ink that reads "Kaim Knutson". The signature is written in a cursive, slightly slanted style.

Docket ID No. EPA-HQ-OAR-2022-0829, Proposed Rule: Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles

Comments Submitted by Chevron Corporation

June 30, 2023

Chevron is committed to providing affordable, reliable, and ever-cleaner energy to our customers. Chevron supports technology neutral policies at the federal level that drive greenhouse gas (GHG) emission reductions in the transportation sector. We offer the following comments in reference to the EPA's proposed light-duty and medium-duty standards.

1. Lifecycle GHG based standards.

The proposal is focused on tailpipe GHG emissions rather than lifecycle emissions. Therefore, upstream GHG emissions for fuel and vehicle manufacturing are not included in the analysis, favoring "zero tailpipe emission" technologies like Battery Electric Vehicles (BEV).

We recommend EPA revise the proposed standards to incorporate a lifecycle GHG assessment of light and medium duty vehicles and fuel technologies. In an analysis of the California Air Resources Board Advanced Clean Cars II program, a study performed by Ramboll¹ in 2022 concluded that a transition to lower carbon intensity (CI) gasoline could provide similar lifecycle GHG emissions compared to zero tailpipe emission alternatives. The Ramboll study utilized a full lifecycle approach to account for emissions associated with vehicle material recovery and production, vehicle component fabrication, vehicle assembly, and vehicle disposal/recycling. EPA should consider alternatives such as low-CI liquid fuels to provide multiple compliance options and avoid a one-size-fits-all solution to reducing transportation sector GHG emissions. Lifecycle assessment is a technology neutral approach that allows for more flexibility in the transition towards reducing transportation GHG emissions in the short and long-term.

The proposal does not incentivize GHG reductions from the existing vehicle fleet, thus missing an opportunity to accelerate GHG reduction in the early years of the program. Recent published research from SUNY² shows that the time value of carbon is important in evaluating technology pathways to maximize emission reductions from the fleet of heavy-duty trucks that includes new and older trucks in-use. GHG emissions generated by the truck fleet accumulate in the atmosphere and dissipate slowly over time. GHG emissions that may be reduced or eliminated today can be more valuable than future emission reductions given the annual

¹ Ramboll US Consulting Inc "Multi-Technology Pathways to Achieve California Greenhouse Gas Goals Light-Duty Auto Case Study" May, 2022; Available here: www.arb.ca.gov/lists/com-attach/477-accii2022-AHcAdQBxBDZSeVc2.pdf beginning page 59

² Quantifying the comparative value of carbon abatement scenarios over different investment timing scenarios - College of Environmental Science (exlibrisgroup.com)

accumulation of emissions. While this study focused on heavy-duty vehicle examples, the time value of carbon concept would apply equally to GHG emissions from light and medium-duty vehicles. A GHG reduction strategy that focuses on lifecycle emissions, as opposed to tailpipe emissions only, would incentivize near term emission reductions that would create long term environmental benefits.

2. Broad technology approach.

There are a wide variety of vehicle technologies and fuel types that can be used to meet consumer needs, employing market-based approaches instead of focusing exclusively on zero tailpipe emission technology options. EPA could allow for innovation within the current market to dramatically reduce GHG emissions, without the systemic risks associated with a single technology solution. It is unlikely that the market would identify a single vehicle technology that would be appropriate for all different customer needs. The proposed rule should be broadened to encourage the use of multiple technologies by establishing a neutral, market-based, lifecycle standard. Light and medium duty vehicles powered by biofuels, hybrid technologies, and renewable natural gas leverage the existing infrastructure and are proven to deliver the power, convenience, and functionality desired by consumers.

Hybrid electric, plug-in hybrid electric, and internal combustion technologies can be paired with lower carbon intensity fuels to result in lower GHG emissions from light and medium duty transportation. These alternative pathways would not require the wholesale transformation of electric energy production and distribution infrastructure on an unprecedented, abbreviated time scale. They would allow battery, hydrogen, and low-carbon intensity gaseous and liquid fueled vehicles to compete to achieve the GHG targets for light-duty transportation in the quickest and most cost-effective manner.

For example, the Ramboll Light Duty Auto Case study showed that a zero-tailpipe strategy did not achieve the maximum emission reductions possible. A fleet mix that deployed a wider range of technologies, including hybrid electric, plug-in hybrid electric, BEVs, and fuel cell electric vehicles, along with a gradual phase-in of low-CI gasoline, out-performed the ZEV only deployment strategy in the near-term and achieved equitable emission reductions in the long-term³.

Argonne National Laboratory's "Cradle-to-Grave Lifecycle Analysis of U.S. Light-Duty Vehicle-Fuel Pathways: A Greenhouse Gas Emissions and Economic Assessment of Current (2020) and Future (2030-2035) Technologies" report⁴, demonstrates that the combination of

³ Ramboll US Consulting Inc "Multi-Technology Pathways to Achieve California Greenhouse Gas Goals Light-Duty Auto Case Study" May, 2022; Available here: www.arb.ca.gov/lists/com-attach/477-accii2022-AHcAdQBxBDZSeVc2.pdf Figure 4-8

⁴ Argonne GREET Publication: Cradle-to-grave lifecycle analysis of U.S. light-duty vehicle-fuel pathways: a greenhouse gas emissions and economic assessment of current (2020) and future (2030-2035) technologies (anl.gov)

advancements in lower carbon fuel and higher efficiency vehicles can help all vehicle propulsion types achieve parity for GHG emissions. The Argonne study states,

“...large GHG reductions for LDVs are challenging and require consideration of the entire life cycle, including vehicle manufacture, fuel production, and vehicle operation. Achieving a life cycle reduction in GHG emissions is a challenging task and must overcome both technological hurdles as well as cost and market acceptance constraints.”

This conclusion reinforces our belief that a robust vehicle standard, embracing a lifecycle method to quantify vehicle emissions, is the preferred approach to reducing the GHG impact of light and medium-duty transportation.

3. The role of biofuels.

The light and medium duty proposal does not address the potential for biofuel use to create energy security benefits. EPA should consider options to reduce the nation’s dependence on a single transportation energy resource infrastructure while it supports a reliable and affordable decarbonization plan for transportation. EPA should support the use of diversified fuels in the nation’s transportation fleet to meet nationwide GHG reduction goals.

Chevron is investing in capabilities to increase the supply of biofuels. In 2022, Chevron acquired Renewable Energy Group, a leading biodiesel and renewable diesel fuel producer. Chevron announced a collaboration with Corteva to introduce winter canola that will produce lower carbon intensity feedstocks. Chevron has invested in CoverCress to develop and introduce small winter oilseeds that will also produce lower carbon intensity feedstocks. A Chevron joint venture with Bunge, a leading oilseed processor, will expand crush capacity to yield greater access to lower carbon intensity feedstocks. The biomass-based diesel fuels resulting from these technology and commercial initiatives are well-suited to reduce emissions from the medium duty vehicles that are powered by diesel engines.

We believe there is also potential for increased use of lower CI ethanol and other renewable fuels to produce renewable gasoline blends for the light and medium-duty fleet. With more than 265 million gasoline-powered vehicles on the road today in the United States, renewable gasoline blends could empower virtually all drivers to contribute to a lower carbon transportation future. Recently, we partnered with Toyota to demonstrate lower carbon technologies are compatible with internal combustion engines by demonstrating the use of fuel with more than 40% lower carbon intensity than traditional gasoline on a life cycle basis.

Looking into our transportation future, Chevron is developing, producing, and testing blends of lower carbon intensity renewable gasoline. These blends can be manufactured using today’s facilities and used in almost any gasoline-powered vehicle, delivering an immediate GHG reduction compared to traditional gasoline. Renewable gasoline blends use a variety of feedstocks and technologies to achieve carbon intensity reductions. Along with innovation from

engine manufacturers and public policies supporting lower carbon intensity fuels, renewable gasoline blends are intended to reduce the carbon intensity of light and medium duty vehicles already on the road.

4. Feasibility and implementation.

Chevron is concerned that the rapid increases in forecasted BEV sales rate are optimistic and may overstate the benefits of the proposals. The proposals may limit choices and increase costs for consumers, including those in economically disadvantaged groups and smaller businesses.

BEV sales forecasts may rely on optimistic expectations for increased electricity generation and charging infrastructure. EPA should conduct an assessment to account for the costs and timing associated with upgrades to the nation's grid infrastructure, including new and upgraded generation, transmission, and distribution, and the costs associated with the installation of public and private electric vehicle chargers. If it is not feasible to complete expansion and improvements for the current grid, it may not be possible to meet the additional demand created by the proposed regulation.

Stakeholders have expressed concern about the supply and availability of critical minerals and supply chains for battery manufacturing, many of which are sourced from China. EPA should quantitatively assess the impact this regulation will have on the nation/worldwide demand of lithium and other rare earth metals, and the emissions that will be produced as a result of mining and shipping these materials. EPA should consider environmental impacts from mining of semi-precious metals and potential mitigations. The proposal does not address the potential hazards, construction, noise, or other impacts and potential mitigations for these impacts.

EPA should also consider the impacts associated with the loss of revenue for the highway trust fund resulting from increased sales of BEVs. Reductions in excise taxes and local sales taxes on gasoline will impair the ability of state and local governments to maintain and improve roadways, resulting in more traffic congestion, longer travel times, and added depreciation and repair costs.

It is important for EPA to plan for uncertainty in the feasibility and timing of meeting the standards proposed in the light and medium duty rule. We endorse the recommendation from API in their written comments to implement an interim program review, with provisions for adjustment of the standards if adequate progress is not being demonstrated. These important program elements should be incorporated into any final regulatory action.

5. Potential future fuel controls.

In Section IX. (Consideration of Potential Fuels Controls for a Future Rulemaking) of the proposed rule, EPA discusses an opportunity to address particulate matter emissions from the existing and future fleet through changes in fuel compositions. Chevron has extensive technical expertise in fuel formulation, emissions testing, and analytical methodology. Based on our experience, we believe EPA's suggested approach to controlling particulate matter may not be cost effective or necessary. We offer the following comments on Section IX.

Specifically, Chevron recommends against EPA's consideration of Particulate Matter Index (PMI) methodology as an option to control particulate matter (PM) emissions from gasoline. The PMI methodology was developed over 10 years ago and is based on testing with Tier 2 vehicles and fuels. The transition to Tier 3 vehicles and fuels has greatly reduced PM emissions from the vehicle fleet. Vehicle hardware technology advancements, such as gasoline direct injection and higher fuel injection pressures are better suited to manage the remaining PM emissions rather than changing the gasoline composition. When the PMI methodology is used to evaluate current gasoline samples, Tier 3 gasoline has shown a steady reduction in calculated PMI compared to Tier 2 gasoline, even where the Tier 3 samples have higher final distillation boiling temperatures. The combination of advanced vehicle technology and improved Tier 3 gasoline quality suggests that the PMI methodology may no longer be effective at identifying future PM control measures.

As an alternative to PMI, EPA suggests that ASTM D7096 SIMDIS may be the best technology to evaluate candidate gasoline fuels and to determine a new standard to address PM emissions. Chevron does not believe the use of SIMDIS is appropriate because it does not distinguish between molecules that contribute to PM formation and molecules that do not form particulates. Use of the SIMDIS methodology will result in a fairly imprecise reduction in the final boiling point of gasoline. Changing the gasoline distillation specification in this way will eliminate many non-PM forming molecules, like heavy alkylate species, which are valuable components for gasoline octane, vapor pressure, and economics.

In lieu of using the SIMDIS analytical method, Chevron prefers the vacuum-UV (VUV) technology. Chevron has developed gasoline characterization methods using VUV and believes that it is well suited to identifying particulate-forming molecules. Chevron is available to work with EPA in identifying analytical techniques that could be used in evaluating PM formation from gasoline.

The API comments on the proposed rule contain an extensive discussion of the technical issues related to particulate matter formation. Chevron made significant contributions to the API comments. We endorse the API comments on Section IX. in their entirety. We recommend that EPA should work closely with industry prior to any decision to proceed with a formal rulemaking to address gasoline particulates.

Conclusion

Chevron is actively engaged in developing technology and commercial strategies to reduce the GHG impact of transportation. We recommend that a lifecycle analysis basis is more appropriate than a tailpipe only basis for regulating the GHG emissions from light and medium-duty vehicles. EPA should employ a methodology that prioritizes GHG reductions early in the program while the transition to lower carbon intensity technologies occurs over time. Multiple vehicle technologies will be needed to address this challenge. Renewable fuels can make significant contributions to GHG reduction using existing infrastructure. We urge EPA to reconsider their proposal and incorporate our recommendations in the final rule.