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California Air Resources Board

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https://ww2.arb.ca.gov/approved-comments?entity_id=47911

Subject: Comments on California Air Resources Board Drive Forward Proposal

Ford Motor Company (Ford) hereby submits its comments on the California Air Resources Board (CARB) Drive Forward proposal. We appreciate the opportunity to comment as well as CARB's time and consideration of the comments.

Ford values the ongoing opportunities to collaborate with CARB and looks forward to continuing our discussions on the Drive Forward rulemaking, where stable and achievable standards remain our highest priority. Because vehicle programs require several years of lead time for engineering, calibration, and testing, establishing clear and achievable standards is vital to allow Ford to develop its product cycle with confidence.

Our technical comments on the CARB proposal are provided below. In addition to these comments, Ford fully supports the Alliance for Automotive Innovation's comments on the Drive Forward proposal.

If you have any questions, please contact Chris McCarthy, Vehicle Environmental Regulatory Strategy & Planning (cmccar61@ford.com), or Ryan Bickmore, Senior Counsel (rbickmor@ford.com). Thank you for your attention to these comments.

Sincerely,

Mark Polster



Ford Motor Company Comments on CARB's Drive Forward Proposal

Ford's Technical Comments on the CARB Proposal

Light-Duty Fleet Average Standards (NMOG+NOx and Greenhouse Gas)

CARB's Drive Forward Proposal includes very stringent criteria (NMOG+NOx) and greenhouse gas (GHG) fleet average standards. These fleet standards are not possible with advanced ICE technology alone. Our preliminary analysis shows that zero emission vehicle (ZEV) sales would need to increase far beyond current market penetration rates to barely meet the proposed standards. Ford will review CARB's proposals further and will provide a more detailed analysis in a future meeting.

Low-emission Vehicles (LEVs) Criteria Program

Ford opposes eliminating altitude relief for NMOG+NOx standards. Applying the same standard across both low- and high-altitude conditions will increase the cost and complexity of meeting NMOG+NOx standards, which are already challenging on their own, and will likely push vehicle development toward expensive, limited-capacity high-altitude facilities and test chambers. Given that the share of miles driven at high altitude is relatively small, CARB should weigh these substantial engineering costs against the limited real-world benefit.

On Quick Driveaway and Partial Cool-Down Standards, if these conditions are adopted, CARB should retain the LEV IV approach rather than introducing new requirements. Similarly, for PHEV High-Power Cold Start provisions, if adopted, CARB should generally retain the LEV IV approach; however, we encourage CARB to reconsider the step 2 PHEV high-power cold start requirements as they warrant further evaluation before implementation.

Particulate Matter Standards

Ford opposes CARB's proposed 0.5 mg/mi particulate matter standard and instead supports retaining the LEV IV PM standards for light- and medium-duty vehicles, paired with expanded in-use PM relief applicable across all model years throughout the program. A 0.5 mg/mi standard would require OEMs to equip Gas Particulate Filter (GPF) hardware on the entire light- and medium-duty ICE fleet, adding significant cost and packaging challenges even though these vehicles contribute only a small fraction of total real-world PM2.5 emissions emitted in California. The resulting difference in total PM emissions load and impact on ambient air quality is negligible, and it is not cost-effective to meet such a stringent standard, particularly for light-duty vehicles.

Ford also has concerns about the feasibility of accurately and repeatably measuring PM at such low levels. Current equipment and technology experience significant variability at these low emission values, often inflating results and making certification difficult and error prone.

Beyond measurement concerns, GPFs increase exhaust back pressure, which restricts exhaust flow and forces the engine to waste energy expelling combustion gases, disrupting the engine's ability to breathe freely and generate power efficiently. In other words, current GPF integrations degrade vehicle capability.

Ford looks forward to continued engagement with CARB on PM emission standards, including data on the challenges associated with GPFs and PM measurements at low levels.

Ford Motor Company Comments on CARB's Drive Forward Proposal

Non-Exhaust Emissions (NEE) from Brake Wear

Europe has begun regulating non-exhaust emissions (NEE) from brake wear under Euro 7. European brake pads have traditionally used softer materials, trading longevity for better performance—resulting in more brake dust. Ford North America already uses low-particulate materials in our vehicles. Eastern Research Group (ERG)'s 2021 Brake and Tire Wear Emissions report confirmed that OEM non-asbestos organic friction materials produce less than half the particulate matter of aftermarket low-metallic friction materials. Ford does not support CARB's proposed brake wear PM mass emissions regulations, nor do we have the testing facilities to comply with them. We encourage CARB to continue researching brake materials and to update its EMFAC model to account for the materials OEMs currently using along with the impacts of aftermarket brake pads.

Evaporative Emissions: NIRCOS Fuel System

Ford is concerned that the proposed NIRCOS in-use leak standard of 0.001-inch does not account for the measurement uncertainties inherent in testing complete, in-service vehicles as opposed to the controlled laboratory conditions (inert gas, stable temperature, high pressure, small isolated volumes) under which leak-detection equipment is typically utilized at the component/subsystem level. Full-vehicle evaporative systems present additional variables—including residual fuel vapor generation/condensation, pressure-sensitive components not designed for high-pressure testing, and long thermal stabilization times, all of which can significantly affect measurement repeatability and reproducibility (R&R) at this level of precision. Ford believes a formal gauge R&R study is necessary to validate that any proposed vehicle test method and threshold can be reliably and consistently applied to in-service customer vehicles, and we would welcome the opportunity to support CARB in developing this study.

Plug-In Hybrid Vehicles (PHEV) in the Drive Forward Program

Plug-in hybrids are a cornerstone of Ford's compliance strategy because they meet customers where they are, rather than forcing an all-or-nothing leap to battery electric ownership. PHEVs give customers strong electric-only driving for daily commutes paired with the range flexibility and confidence of a gas backup, eliminating the range anxiety and charging-infrastructure dependence that continue to slow full BEV adoption nationwide. This makes PHEVs especially critical for electrifying the truck and full-size segment, which remains the hardest market to convert from gas and diesel.

Ford's own investment underscores this point: the next-generation F-150 Lightning is shifting to Extended Range Electric Vehicle (EREV) architecture, using an onboard generator to extend driving range while the truck is propelled entirely by electric motors, giving owners a pure EV driving experience without the need to stop and charge during long-distance towing. This demonstrates that Ford is doubling down on electrified powertrains that solve the towing and range challenges unique to trucks, rather than abandoning electrification.

Given this level of investment, CARB's proposal to reduce the PHEV GHG utility factor is not appropriate, as it would undercut the technologies that are successfully bridging customers to electrification and would disincentivize PHEV adoption at a critical moment. Instead, CARB should recognize the GHG and criteria emissions benefits PHEVs deliver relative to conventional gas and

diesel vehicles, and Ford is prepared to work with CARB on the specific details of quantifying and crediting those benefits. Finally, PHEVs should be counted within CARB's ZEV fleet requirements, at a lower fractional value, in recognition of the meaningful electric-mile contribution they provide toward reducing overall fleet emissions.

Zero-Emission Vehicle Regulations

Ford is developing a new Universal EV Platform aimed at making electric vehicles genuinely affordable, backed by about $5 billion in investment and nearly 4,000 jobs at the Louisville Assembly Plant and BlueOval Battery Park Michigan, where advanced prismatic Lithium Iron Phosphate (LFP) batteries will be produced domestically instead of imported from China. The first vehicle built on this platform will be a midsize, four-door electric pickup truck with a targeted starting price of around $30,000, built in Louisville and expected to reach customers in 2027. Despite the low price, Ford is not stripping the truck down to essentials; it is designed to be efficient, customizable, and fun to drive.

It is worth noting that ZEV assurance measures carry real costs that are ultimately reflected in the final vehicle price. If these compliance and assurance costs aren't carefully managed, they could erode the affordability gains Ford is targeting with this platform and potentially slow, or even completely stop, broader market adoption of low-cost EVs, undermining the very goal the Model T-inspired approach is meant to achieve: more EVs in the market.

BEV Window Sticker

Ford has several concerns regarding the proposed BEV Window Sticker. First, the inclusion of a charging speed section would necessitate entirely new testing protocols, adding significant complexity and cost to the existing certification process. Second, displaying multiple driving ranges alongside the current EPA window sticker risks creating consumer confusion with new range metric values that could be challenged by consumers and the media. The overlap between the proposed information on the CARB EV label and the current EPA label needs careful reconsideration before implementation. Finally, rather than adding another physical window sticker, we would prefer a QR code-based solution, which would allow for more flexible, up-to-date information delivery without compounding label clutter or certification burden.