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**MECA COMMENTS ON THE
CALIFORNIA AIR RESOURCES BOARD'S
PROPOSED 15-DAY CHANGES OF THE
ADVANCED CLEAN FLEETS REGULATION**

MECA would like to provide both supportive comments as well as constructive recommendations on the proposed Advanced Clean Fleets (ACF) rulemaking to reduce greenhouse gas and criteria emissions generated from on-road heavy-duty fleets.

MECA commends CARB's ongoing leadership to accelerate the adoption of zero-emissions heavy-duty trucks to reduce the environmental footprint of transportation to meet the state's carbon neutrality and SIP goals. We also believe that lessons learned in the early years of the ACF should be incorporated in the future to further align the rule with the Advanced Clean Truck (ACT) as well as the overall goal of carbon neutrality from medium- and heavy-duty engines and vehicles through the application of additional strategies including the use of innovative technologies and fuels.

MECA is non-profit association of the world's leading manufacturers for clean mobility. Our members have nearly 50 years of experience and a proven track record in developing and manufacturing clean mobility technology for a wide variety of on-road and off-road vehicles and equipment in all world markets. Our members provide the technologies that enable electrification and all electric (both battery and fuel cell) technologies as well as emission control and engine efficiency technologies to allow all vehicles to be the cleanest possible. Our industry has played an important role in the environmental success story associated with light- and heavy-duty vehicles in the United States and has continually supported CARB's efforts to develop innovative, technology-advancing, regulatory programs to deal with air quality and climate challenges.

Summary

MECA supports the alignment of zero emission truck purchase requirements under the ACF with the previously adopted ACT regulation. We are providing constructive comments, which could strengthen these regulations and ensure that the environmental goals are achieved as fleets transition to zero tailpipe emission technology. Our suggestions for CARB's consideration are summarized here:

1. MECA strongly supports the expanded flexibilities provided in these proposed 15-day changes for affected fleets which allow the purchase of Omnibus low NOx compliant

engines when zero emission vehicles or infrastructure are not available or cannot be delivered in a timely manner.

2. MECA believes that the targets in this ACF proposal are extremely ambitious, especially in the early model years, and would benefit from the allowance of additional technologies and fuels.
3. MECA supports revisiting the Zero Emission Powertrain (ZEP) requirements to establish improved performance standards for the batteries and components on electric trucks. This will provide confidence in the durability and reliability of electric technology to fleet managers and drivers and support the targets in the ACT and ACF.
4. The advancement of the 100% ZEV sales requirement to 2036 will make the already challenging ACF implementation timeline even more challenging.

Expanded Flexibilities for Affected Fleets

MECA commends CARB staff on the continued outreach with affected fleets and industry to further develop flexibilities including extensions and exemptions in this amended proposal. According to the California Energy Commission (CEC) website¹, at the end of Q2 2022, there were 1,943 medium and heavy-duty zero-emissions trucks (ZETs) operating in California including 1,369 buses, 306 trucks and 268 delivery vans. Based on our interpretation of the ACF fleet rules, the total number of ZETs will have to increase at least 5 to 7-fold in MY2024, followed by another 50% increase in MY2025 and >25% in MY2026. The high growth rates in the early years of the ACF require flexibilities to accommodate the initial learning curve in ZET and electric component manufacturing, the coordinated buildout of charging infrastructure and the training of repair and maintenance personnel necessary to ensure fleet operations are not impacted. Given the anticipated demand for ZETs in California as well as other 177 states, MECA supports increased flexibilities and allowances such as the substitution of vehicles employing California certified engines compliant with Omnibus LHDDE, MHDDE or HHDDE low emission requirements or LEV IV Class 2b and 3 work trucks and advanced plug-in hybrid powertrains.

The Use of Additional Low and Near-Zero Emission Technologies and Low Carbon Fuels

MECA agrees that balanced and coordinated sales and purchase mandates signal to industry and fleets the state's desired long-term intentions. However, the history of the light-duty ZEV requirements has resulted in multiple corrections in response to technology readiness, vehicle supply and market demand. The ACF fleet rules represent even greater challenges due to the variety of vehicles and vocations with diverse infrastructure needs. The workshops supporting ACF rule development have provided a dialogue forum for all parties to better articulate these challenges and we commend staff for their willingness to refine the various exemptions and extensions.

Technology suppliers believe that the inclusion of additional parallel compliance pathways toward the objective of net zero emissions can provide greater GHG reductions while further

¹ <https://www.energy.ca.gov/data-reports/energy-almanac/zero-emission-vehicle-and-infrastructure-statistics/medium-and-heavy>

reducing the risks associated with allowing only limited technology options. MECA believes this will be important over the next decade as critical mineral supplies, infrastructure and fleet experience develop and mature. We thank staff for expanding the applicable compliance technology pathways to include a variety of low NOx engine trucks operating on diesel and natural gas for hard to electrify vocations where ZETs may not be available in time for the specific compliance dates.

Hydrogen-fueled heavy-duty engines

Of the exemptions offered by these 15-day changes, MECA believes that special consideration and purchase incentives should be offered to internal combustion engines that are modified to operate on the same zero-carbon hydrogen (H₂-ICE) that is needed and used by fuel cell powered trucks. Nearly all on-road and off-road engine OEMs, along with their suppliers, are developing H₂-ICE for MY 2026-2027 commercial introduction. The main reason that we believe that H₂-ICE technology warrants special consideration and incentives under these exemption flexibilities is due to the fact that the use of this engine technology would accelerate the buildout of the hydrogen infrastructure that will be needed for fuel cell trucks. Fleets that install hydrogen storage and fueling infrastructure on their site for their H₂-ICE vehicles would be able to deploy the same infrastructure when they add fuel cell trucks to their fleet. The early installation of hydrogen infrastructure would allow the fleet to seamlessly transition from H₂-ICE powered trucks to fuel cell trucks when the latter technology becomes cost competitive.

There are numerous benefits of H₂-ICE that will accelerate the transition to the ultimate goal of the ACT and ACF regulations. Among the co-benefits that H₂-ICE provides to the ACF regulation include:

- H₂-ICE sales would catalyze investment in the buildout of publicly available hydrogen infrastructure for use by both fuel cell and H₂-ICE trucks and fuel cell passenger cars.
- H₂-ICE technology offers the lowest price hydrogen technology option, compared to fuel cell trucks, through at least 2030 and possibly 2035 reducing the capital costs and ownership costs for fleets.
- By creating a near term market for zero carbon hydrogen, H₂-ICE would accelerate the reduction in the cost of this fuel making future fuel cell truck operations more affordable.
- H₂-ICE would accelerate the development and scale-up of production capacities for high-pressure, 700 bar on-vehicle hydrogen storage tanks that will be needed by, and help reduce the cost of fuel cell trucks.
- In addition, H₂-ICE allows fleets to utilize their current workforce and familiar maintenance practices while facilitating the experience and safety practices that will be needed to maintain fuel cell trucks. Both of these training advantages will help fleets seamlessly transition to FCEV trucks as they become more widely available.

Renewable natural gas and diesel

According to a report prepared for CARB by UC Davis STEPS program², California has the potential to produce approximately 90.6 billion cubic feet (bcf) per year (750 million gasoline gallon equivalents

² <https://ww2.arb.ca.gov/sites/default/files/classic/research/apr/past/13-307.pdf>

(gge) per year) of renewable natural gas (RNG) from dairy, landfill, municipal solid waste, and wastewater treatment plant sources. The use of RNG by heavy-duty natural gas engines that are already certified to the 0.02 g/bhp-hr NOx standard should be supported. Similar benefits could also be obtained from the use of renewable diesel. The combination of low NOx emitting trucks operating on low carbon fuels can deliver early GHG reductions as the fleets transition to zero emitting trucks where possible.

Heavy-duty HEV powertrains

Serial hybrids and especially those running low carbon fuels deploying downsized engines and smaller battery packs can offer sizeable GHG reductions for medium and heavy-duty vehicles which may be located or operated outside of existing electric and hydrogen infrastructure corridors.

The Need for Revisiting the Zero Emission Powertrain (ZEP) Requirements

MECA urges CARB staff to revisit the Zero Emission Powertrain (ZEP) requirements to advance performance standards for the batteries and components on electric trucks. We have witnessed over the history of transportation regulations and incentive programs, that performance standards lead to continued progress in the development of cost-effective robust technologies to ensure continued innovation in efficient vehicles and equipment. Tightening performance standards over time will drive innovation in electric truck component development and ensure that electric trucks remain durable and reliable for fleets.

Examples of performance standards for electric vehicles could include battery performance and durability standards as well as range requirements, which have recently been included along with other ZEV assurance measures in CARB's ACC II. For heavy-duty electric batteries, the Informal Working Group on Electric Vehicles and Environment under the UNECE Working Party on Pollution and Energy is currently developing a Global Technical Regulation on battery durability for heavy-duty vehicles (GTR-22). This will be completed next year and offers a template that CARB staff could use to set minimum battery durability standards in California. Analogous to combustion powered trucks, stronger durability requirements provide confidence to consumers who have limited experience with electrified technologies in the commercial vehicle sector.

The advancement of the 100% ZEV sales requirement from 2040 to 2036

The advancement of the 100% ZEV sales requirement from 2040 to 2036 will make challenges under the ACF even more challenging. According to the California Energy Commission³ (CEC) at the end of Q2 2022, ZETs represented less than <0.2% of the current medium and heavy-duty truck in-use fleet (1,943 ZETs out of a state total of 987,817 MD and HD trucks).

³ <https://www.energy.ca.gov/data-reports/energy-almanac/transportation-energy/summary-california-vehicle-and-transportation>

The federal Inflation Reduction Act (IRA) will incentivize purchases of ZETs through 2032. There will be growing competition amongst regulated and unregulated fleets across the country for these funds. Given where it is today, the ZET truck market and charging infrastructure in California would benefit from further data gathering and analysis before revising a 100% ZEV sales requirement before it even begins to be implemented.

Conclusion

In conclusion, MECA commends California's leadership in creating a strong signal and robust market for battery electric and hydrogen powered heavy-duty vehicles. CARB's experience in setting ZEV mandates for light-duty vehicles has shown that markets, supply chains, manufacturing and infrastructure require lead-time to comply with regulatory demands and therefore we support the numerous exemptions and extensions offered by these proposed 15-day changes. These flexibilities will ease the transition for fleets as well as clean mobility technology suppliers. The heavy-duty transportation sector is responsible for a major portion of California's emissions inventory, and CARB has made great strides towards future reductions in emissions from this sector through the recently adopted Omnibus and ACT regulations. There remain significant opportunities to continue to reduce criteria and greenhouse gas emissions from medium- and heavy-duty engines and vehicles through the application of a portfolio of innovative technologies and fuels, including all-electric trucks.

We believe the inclusion of additional compliance pathways will strengthen this proposal by enabling fleets to adopt cost effective low and zero carbon technologies that were excluded in the original August 2022 ACF proposal. Although we believe this is an extremely ambitious timeline for achieving 100% zero emission truck sales, MECA members are committed to delivering the clean mobility technologies that are needed to meet the goals of this regulation as quickly as possible.

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