October 17, 2022

Liane Randolph, Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Advanced Clean Fleets Regulation Public Comment

Clean Transportation Technologies and Solutions

www.calstart.org

Dear Chair Randolph, Board Members, and Staff:

Thank you for the opportunity to provide public comment on the proposed Advanced Clean Fleets (ACF) regulation. The proposed regulation would be one of the most significant climate change mitigation policies in California's history and allow for new zero-emission technologies to be introduced and adopted in the medium- and heavy-duty (MHD) transportation sector on an accelerated pace. This proposal is especially important given that diesel MHD trucks disproportionately produce greenhouse gas (GHG) and nitrogen oxide (NOx) emissions compared to the number of vehicles they represent on California's roads. Converting 100 percent of California's fleets to zero-emission would result in healthier outcomes for the communities that experience the most commercial freight activity and for the people most exposed to harmful emissions and NOx.

We applaud the staff's work to structure a smart, targeted, and efficient ACF regulation that balances the need for a strong regulatory program with one that can be successfully implemented. Still, the accelerating pace of climate change spurs the need for faster action. CALSTART believes we can and must go farther given the tremendous momentum in the implementation of zero-emission MHD vehicle technologies. The landscape for market adoption of zero-emission MHD vehicles, together with anticipated technological advancement in battery costs and range shows a zero-emission future is achievable if policy makers push for it. **With that in mind, CALSTART is recommending the Board adopt the Accelerated ZEV Transition Alternative or a regulatory proposal that is similar in timeline and goals.**

With over 30 years of vehicle technology development, validation, market transformation, and advocacy experience, CALSTART has been a strong partner with CARB in helping reduce emissions in the transportation sector and implement programs to bring new zero-emission vehicles to the state. We are a California-based, internationally recognized non-profit leader in bringing clean transportation technology to the market. Our membership includes 300 members across the sector, including vehicle manufacturers, public and private fleets, electric utilities, electric vehicle charging and hydrogen refueling companies, and a range of other clean energy businesses and organizations.

Why We Need Strong ACF Regulation

MHD trucks across the country make up only eight percent of the current on-road vehicle population. Unfortunately, these trucks are responsible for 32 percent of on-road GHG or

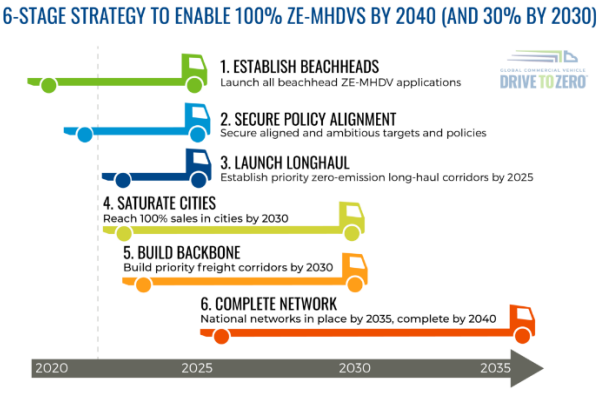
carbon dioxide (CO2) equivalent, 63 percent of on-road NOx, and 68 percent of on-road emissions of particulate matter with a diameter of 2.5 microns or smaller (PM2.5).[1]

According to the American Lung Association, California has the most polluted cities in the country when ranked by ozone, by year-round particulate pollution, and by short-term particulate pollution.[2] California communities where MHD fleets are based, or traverse, are associated with issues of environmental injustice and long-term adverse health outcomes.

CARB staff, in the Proposed Advanced Clean Fleets Regulation Staff Report, Initial Statement of Reasons (ISOR) said that the Accelerated ZEV Transition Alternative results in emissions reductions and increases in healthier outcomes. CARB staff estimates the total statewide valuation of health benefits to be $92 billion from calendar year 2024 through calendar year 2050, with most of that valuation being the result of avoided cardiopulmonary death.[3]

Combining the air quality benefits with the increasing urgency for faster action on climate change reinforces the importance of the proposed ACF regulation. The Sixth Assessment Report from the U.N. Intergovernmental Panel on Climate Change stated that urgent actions to reduce greenhouse gas emissions were needed within the next five years to have any chance of avoiding the most dangerous climate impacts and that climate change is accelerating faster than past forecasts projected. One of the mitigation strategies cited was accelerating transportation electrification.[4]

To support this need and to align with the Advanced Clean Truck (ACT) timelines being adopted by other states and nations worldwide, CALSTART's Global Commercial Vehicle Drive to Zero (Drive to Zero) program this year created a Global Roadmap for Reaching 100 Percent Zero-Emission Medium- and Heavy-Duty Vehicles by 2040. A key tenet of that plan involves faster deployment of Class 8 zero-emission tractors (envisioned by staff's ACF proposal) and a deeper and faster penetration of zero-emission commercial vehicles in city and urban duty cycles.[5] CALSTART believes the Accelerated Zero Emission Vehicle transition strategy is required to stay on this timeline.



[1] Al-Alawi, MacDonnell, McLane, Walkowicz, Zeroing in on zero-emission trucks, 4.
[2] American Lung Association, Most Polluted Cities, 2022
[3] Proposed Advanced Clean Fleets Regulation Staff Report: Initial Statement of Reasons, 252
[4] IPCC Sixth Climate Assessment Report, https://www.ipcc.ch/report/ar6/wg3/
[5] Global Roadmap for Reaching 100% Zero-emission Medium-and Heavy-duty vehicles by 2040, June 2022.

ZET Technology is Already Working and Continuously Improving

Importantly, the rapid shift to zero-emission trucks (ZETs), and transport in general, is not limited only to California but is part of a global transition that is reflected in accelerating deployments in all parts of the world and on every continent. CARB's annual review of zero-emission technology readiness for its FY22-23 Heavy-Duty Investment Strategy (HDIS) found continuing and significant progress in existing market products and next-generation capabilities.[6] This scale and its scope are building industrial capability and supply chain confidence that has direct benefits to the State. Currently, commercially deployed ZETs primarily consist of battery-electric trucks; hydrogen fuel cell electric trucks are under development and doing demonstration projects throughout the country. CALSTART's Zero-Emission Technology Inventory tool chronicled over 207 different ZE-MHD models from over 60 manufacturers just in North America.[7] Worldwide, this tally now reflects more than 800 ZE-MHD models that has grown by 33 percent just in the last year.

ZETs provide an opportunity to address transportation's outsized role in climate change and harmful air quality. A complete transition to ZET technology will lower total cost of ownership (TCO) for fleets and create job growth in California. A 2019 CalETC report forecasts that by 2030, all MHD battery-electric trucks in California will have a lower TCO than their counterpart diesel trucks.[8] While current deployment of ZETs is low compared to total MHD truck registrations in the United States, CALSTART expects deployments to significantly increase over the next few years. This is supported by commercial ZET pending orders of over 140,000, inclusive of large orders from Amazon (100,000 over the next eight years).[9] In California, the state's Hybrid and Zero-Emissions Vehicle Incentive Voucher Program (HVIP) has over 1,200 pending orders for ZETs, which are expected to be completed within 18-months of voucher redemption. Additionally, 280 Class 8 battery-electric and fuel-cell electric drayage trucks will be deployed as part of the joint CARB and California Energy Commission (CEC) Zero-Emission Drayage Truck and Infrastructure Pilot Project.

Technologies for ZETs are improving as manufacturers look to meet critical California and national requirements. Data from zero-emission buses has allowed manufacturers to continue refining their ZET technology and improvements in battery manufacturing have allowed battery costs to decrease while energy density-and therefore range-have improved. ZET and ZEV legislation and regulations, pioneered by the State of California and CARB (Advanced Clean Trucks, Advanced Clean Cars I and II) have allowed other states to implement similar regulatory requirements and actions. These legislative and regulatory adoptions allow manufacturers to move forward with ZET and ZEV technology and investments with more certainty and provide greater clarity in planning integration of zero-emission trucking into their long-term strategies. Volvo Trucks President Roger Alm in announcing the start of manufacturing of a 44-ton electric truck, said, "We have sold 1,000 units of our heavy electric trucks, and more than 2,600 of our electric trucks in total. We expect volumes to increase significantly in the next few years. By 2030, at least 50 percent of the trucks we sell globally should be electric."[10] Additional major

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[6] https://ww2.arb.ca.gov/sites/default/files/2022-10/fy2022_23_funding_plan_appendix_d.pdf
[7] CALSTART Zero-Emission Technology Inventory, Accessed 2022
[8] 2019, Comparison of Medium- and Heavy-Duty Technologies in California
[9] 2022, About Amazon – Amazon's electric delivery vehicles from Rivian roll out across the U.S.
[10] CleanTechnica - Volvo Trucks ramps up big electric truck production

manufacturers such as General Motors, Ford, Daimler, and Paccar, among many others, have also announced commitments to transitioning their products toward zero-emission technology to achieve a carbon neutral future.[11] And entirely new, "EV-born" manufacturers are springing up to offer zero-emission models capable of competing with traditional manufacturers.

California's ZET Population Continues to Grow

As of January 2022, CALSTART had identified 1,215 ZET deployments across the United States, with a majority (738) being in California. More than 4,000 additional ZE-MHDs are actively on order in California, the bulk of them ZETs, which will quadruple the state's deployments.[12] Most truck makers have multiple ZET products now available. Entirely new capabilities, such as the ability to drive longer distances with full loads, have been announced for the 2023 and 2024 timeframes, enabling the first zero-emission freight corridor segments.

As seen through the number of voucher requests submitted through California's HVIP program, demand for ZETs continues to increase year over year. In operation since 2010, the first eight years of HVIP saw combined requests come in at less than $175 million. During the 2018 HVIP windows, requests for vouchers came in over $176 million, more than all the previous program years combined. In 2021, with a decade of outreach and implementation already underway, program voucher requests topped $240 million.

ZET deployments to date are largely consistent with the Beachhead Theory of Change, a zero-emission technology strategy pioneered by CALSTART and CARB which drives state strategy. Indeed, the Beachhead Strategy strongly points to the viability of early return-to-base city applications as ripe for electrification at a pace exceeding the ACF draft timeline.[13] Additionally, while a majority of the MHD ZET population is currently medium-duty, the heavy-duty (HD) number of ZETs is expected to grow due to increased HD truck model availability and the current volume of future HD truck orders. Corporate sustainability goals for shippers are also driving the need for more regional Class 8 ZETs even beyond the drayage market requirements from Southern California ports.

California's multi-year ZEV budget investments, starting in fiscal year 2021-2022 show a commitment to full ZET adoption in the state. In 2021, Governor Gavin Newsom set a goal of helping fund 1,000 new zero-emission drayage trucks 1,000 new zero-emission school buses, and 1,000 new zero-emission transit buses. The administration and legislature have committed to $10 billion in multi-year funding for zero-emission vehicles (ZEVs) and ZEV infrastructure, sending a signal to the market, manufacturers, and fleet owners and operators that California will provide incentives for early adopters. Furthermore, analysis of real-world telematics data suggests that approximately 65 percent of medium-duty trucks and 49 percent of heavy-duty trucks are regularly driving

[11] Analysis of Public Sales Commitments of Medium- And Heavy-Duty Vehicle Manufacturers and Expected Volumes, CALSTART, https://globaldrivetozero.org/site/wp-content/uploads/2021/12/OEM-Analysis-Paper_December_2021.pdf

[12] California HVIP https://californiahvip.org/impact/#deployed-vehicle-mapping-tool

[13] CARB HD Investment Strategy https://ww2.arb.ca.gov/sites/default/files/2022-10/fy2022_23_funding_plan_appendix_d.pdf

short enough routes that they could be replaced with electric trucks that are on the market today.[14]

How a Strong ACF Compliments Current California Regulations

Governor Newsom's Executive Order on climate required all MHD vehicles to be zero-emission by 2045.[15] The Accelerated Zero-Emissions Vehicle Transition would put a 100 percent ZEV sales requirement to 2036 instead of 2040 and result in roughly 560,000 ZEVs by 2035 and 1,810,000 ZEVs by 2050. This would be an increase of 230,000 compared to the proposed ACF regulation.[16]

Infrastructure Needs to Improve to Achieve a Stronger ACF Regulation

Ensuring a 100 percent transition to zero-emission fleets will require the California legislature to continue public investment in MHD infrastructure. California must also continue providing incentives for private investment in ZEV infrastructure through programs like the Low Carbon Fuel Standard (LCFS). This public-private partnership in ZEV infrastructure will be necessary to ensure enough charging and refueling stations for ZETs.

Given California's policies and goals to advance zero-emission passenger and commercial vehicles, CALSTART recommends that California allocate 15 percent of future National Electric Vehicle Infrastructure (NEVI) funds to MHD charging. The state is expected to receive almost $400 million over the next five years but did not allocate any funding explicitly for MHD infrastructure in their original Deployment Plan for NEVI.

California must also strengthen its commitment to MHD ZETs via the Energiize program through the CEC. As CARB moves forward with ACF, the legislature must prepare and follow through on long-term funding for fleet electrification and hydrogen refueling. This means investments in charging and refueling infrastructure designed to minimize downtime for fleets, provide safe charging and refueling opportunities, and locating charging and refueling stations in ways that are most beneficial for fleets and their commercial goods movements.

CARB, CEC, and the California Public Utilities Commission must also work with manufacturers, fleets, and utilities in a way that allows infrastructure improvements to happen on a timeline that matches ACT and ACF. Currently, CALSTART has observed delays in infrastructure installation and complications in utilities' make-ready programs. These can limit and affect fleet plans to transition to zero emission. Different timelines for readiness and problems in delivering infrastructure will enable fleets to continue operating existing vehicles and releasing emissions, NOx, and PM2.5 into communities throughout the state.

To ensure this does not stop fleets from meeting the ACF goals, CALSTART will pull together stakeholders from utilities, manufacturers, fleets, and governing bodies to think through solutions to current and future barriers to zero emissions. CALSTART is also looking at the effectiveness of temporary power units (TPUs) that might be helpful in

[14] RMI, Driving the Course for Early Truck Electrification, https://rmi.org/insight/electrify-trucking/
[15] Governor Gavin Newsom's Executive Order on Climate
[16] Proposed Advanced Clean Fleets Regulation Staff Report: Initial Statement of Reasons, 248

bridging the infrastructure gap. Policy alternatives like TPUs would allow for strategic placement in high-traffic corridors that are not developing the charging infrastructure fast enough to supply growing demand for ZETs. TPUs could be used to alleviate strain on utilities and be transitioned into commercial battery storage or supplementary storage for transportation after utilities are able to provide the necessary energy to the lot.

Conclusion

California's Environmental Protection Agency (CalEPA) has noted the importance of investments in MD/HD and the connection to environmental justice and public health. CalEPA states that, "taking actions to transition from HDVs to zero-emission vehicles by 2045 could significantly reduce statewide emissions of fine particulate matter associated with HDVs by an estimated 58 percent …These reductions have the potential to avoid an estimated 3,800 premature deaths over 25 years, 2/3 of which would benefit people of color."[17]

CALSTART believes that by implementing regulations designed to spur better and cleaner transportation technology, we can do better for California communities. Adopting the stronger ACF proposal similar or equal to the Accelerated ZEV Transition would put California in line with the current, as well as the future, state of technology and would address the needs of our state to mitigate MHD transportation's unhealthy effects. For the reasons listed above, CALSTART asks CARB Board Members and Staff to move forward with the proposed ACF rule with the Accelerated ZEV Transition.

Thank you for the opportunity to provide comment on this important proposed regulation. If you have any questions or comments, please contact me (jolson@calstart.org) or our State Policy Director, Orville Thomas (othomas@calstart.org).

Our comments are informed not only by the technical expertise of our staff, but also by insights of many of our members and partners in the medium- and heavy-duty industry. Our comments, however, reflect the views of CALSTART alone and do not represent consensus across our membership.

Sincerely,

Jessica Olson
Vice President, Policy
CALSTART

[17] Impacts of Greenhouse Gas Emission Limits Within Disadvantaged Communities: Progress Toward Reducing Inequities