August 8, 2022

Ms. Cheryl Laskowski
Branch Chief, Low Carbon Fuel Standard Team
California Air Resources Board
1001 I Street Sacramento, California 95814

RE: Comments on “Potential Changes to the Low Carbon Fuel Standard”

Dear Ms Laskowski,

Thank you for inviting input on reforming the Low Carbon Fuel Standard, as per the “Public Workshop to Discuss Potential Changes to the Low Carbon Fuel Standard” held on July 7, 2022. The LCFS is a crucial tool, but in order for California to achieve its zero-emission vehicle (ZEV) and transportation goals, the LCFS must be reformed to provide necessary revenue for zero-emission fuels, and to help the infrastructure build-out to support zero-emission fueling for medium and heavy duty transportation. Steps must be taken to return credit values to necessary levels, and the policy focus must turn from low-carbon bridges to zero-emission destinations.

As emphasized in the State’s Draft 2022 Scoping Plan Update, “the combustion of fossil fuels has polluted our air, particularly in low-income communities and communities of color, for far too long, and is the root cause of climate change[1].” Fortunately, zero-emission solutions are available today, and if the LCFS is reformulated to support zero-emission technology deployment, it will address the harmful air pollution in low income communities, while also setting California on course for a more equitable and sustainable future. Alternatively, if LCFS is not reformed to support zero-emission fueling and infrastructure, the transition will be substantially delayed and critical emission reduction goals and targets will not be met.

About Forum Mobility

Forum Mobility (Forum) provides zero-emission trucking solutions for drayage in California - we build and operate the charging infrastructure, purchase class 8 zero-emission electric trucks, and wrap all the costs and incentives into one monthly fee for truck drivers or fleet owners.

The need for electrification infrastructure is massive and immediate

With the Truck and Bus rule and the proposed Advanced Clean Fleet rule, combined with the Governor’s EO N-79-20, California is attempting an acute and accelerated transition of the state’s port transport fleet to zero emission vehicles. There are currently over 33,000 class 8 diesel trucks on California’s drayage registry. In five months about 7,000 of these trucks will no

[1] https://ww2.arb.ca.gov/sites/default/files/2022-05/2022-draft-sp.pdf pg. i

longer be eligible for use in the State and must be replaced. Starting January 1, 2024, as per proposed rule, only ZEVs can be added to the drayage fleet. Over the next 12 years, the entire fleet must transition to zero emission vehicles.

The vast majority of these new drayage trucks will be electric: 1) the use case for short-haul drayage fits the capabilities of class 8 electric trucks very well; 2) electric trucks and fueling systems are much cheaper than fuel cell; and 3) electric trucks and fuels are available at scale, now, while other options are not. As of March 2022, CARB's HVIP program has given out vouchers for 2,060 class 8 ZEV trucks, of which 819 are for drayage[2], and all are electric. The only currently available class 8 trucks eligible for HVIP vouchers are electric[3].

We are excited about the possibilities that hydrogen fuel cell vehicles might provide in the future, especially for long-distance transportation. Unfortunately, their development and ability to deploy are not on the same timeline as CARB's zero-emission fleet transition mandates. The danger to avoid is in building two half-bridges of fueling infrastructure - an outcome that does not get the State to the desired ZEV-enabled destination.

Given the immediacy of the drayage fleet transition mandates, CARB must execute a parallel effort to provide for the ZEV fueling infrastructure. Success will require building over two gigawatts of charging infrastructure over the next 12 years just for the drayage fleet. Failure to do so will imperil California's clean air and carbon reduction goals, as well as goods movement in California.

LCFS must be reformed to achieve California's ZEV priorities

Building the fueling infrastructure necessary to support California's ZEV goals will be an enormously difficult undertaking under the best of circumstances, but it has been made more difficult by the recent cratering of LCFS credit values. Credit values have decreased approximately 50% from recent highs, mostly due to an influx in renewable diesel and dairy methane projects. According to CARB data, from Q4 of 2020 to Q4 of 2021, the number of credits in the market has grown by 29%, and 70% of this growth was from growth in renewable diesel and biomethane. In the same period, the number of renewable diesel credits grew by 605,357, a 47% increase, and the number of biomethane credits grew by 279,653, a 52% increase.

The huge decrease in LCFS values is a fundamental challenge to the economics of burgeoning ZEV transportation solutions, and risks undercutting a key policy goal of CARB of "rapidly moving to zero-emission transportation, electrifying the cars, buses, trains, and trucks that now constitute California's single largest source of planet-warming pollution."[4]

Electrifying heavy duty transportation is going to require focused support, and LCFS must be modified to support California's policy goals. The drayage fleet has been singled out by CARB for a mandated and accelerated transition to ZEVs – not to renewable diesel or biomethane – and deserves parallel support for providing charging and building the required ZEV infrastructure.

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[2] https://ww2.arb.ca.gov/sites/default/files/2022-06/hvip_2021_2022_voucher_data.pdf
[3] https://californiahvip.org/vehicle-category/heavy-duty/
[4] Draft 2022 Scoping Plan Update, Executive Summary

To this end, Forum supports increasing carbon intensity (CI) targets - the pre-2030 CI targets should be strengthened, and post-2030 CI targets should be established. Forum notes that the Governor of Oregon recently proposed CI targets of 37% for a similar program, which would exceed the Option B presented by CARB staff. California should take action to maintain its climate leadership position.

Forum also supports capping biomethane and crop-based biofuels. Much testimony has been submitted about the negative impacts and questions about additionality. To that, add the imperiling of zero-emission goals. Simply put, the increasing amount of money sent to book-and-claim renewable natural-gas (RNG) undercuts the State's ability to reduce harmful emissions in our communities via true zero-emission solutions.

Forum support extending the LCFS beyond 2030. Investors' time horizon for analyzing such investments extends well beyond the current end of the LCFS program. Clearly laying out the LCFS requirements to 2045 or longer will allow investors to amortize the costs of electric trucks and infrastructure over a longer time horizon, thereby lowering the costs in the short term. Lowering the costs will help accelerate and scale the adoption of ZEVs.

Forum supports specifying the Energy Economy Ratio (EER) classification between medium and heavy-duty (diesel replacement) applications. This will spur investments in vehicles that create the greatest decarbonization in alignment with the goals of the LCFS program.

In the early days of the LCFS development, the concept of a ZEV-credit was discussed, but ultimately not adopted. It may be appropriate to revisit that concept.

Finally, Forum also enthusiastically supports the creation of a robust MHD FCI. This will be a crucial element in building out the necessary fueling infrastructure for the ZEV transition.

Feedback on CARB's Questions on MHD FCI
As part of CARB's workshop on 7/7/22, CARB asked for feedback on specific questions about a proposed MHD FCI.

a) **Connector types to support.** CCS and MCS.
b) **Design Consideration: Publicly Available**. Forum believes that usage patterns for heavy duty charging depots will be different than for light duty. About 75% of the state's drayage fleet is composed of independent owner/operators, and they will need long-term, reliable access to secure overnight parking where they can dwell charge (charge overnight). As a result, many charging depots will require a hybrid structure for maximum utilization: spaces reserved on a long-term basis for overnight dwell charging, and then opened up for public drop-in (or day-of reservation) opportunity charging during the day. FCI's eligibility considerations should accommodate and support this structure.
c) **Total credits: proposed 2.5% of previous quarter deficits.** Given the number of other potential proposed changes to the LCFS and the uncertainty of related impacts, it is unclear if this is the correct amount of credits. We suggest that CARB scenario-plan a needs-based analysis, and share it with stakeholders for feedback through this rulemaking process. Policy should also be constructed so that future adjustments can be made to achieve the goal without going through a full rulemaking cycle.
d) **Size of nameplate power useful for truck charging**: Don't assume that bigger is always better. A huge challenge is going to be finding sufficient locations, on trucking

routes, with both sufficient space for trucks *as well as* access to power. Many venues will be limited in power availability, and for overnight parking, when time is not at a premium, lower capacity chargers will enable more trucks to be served and ready to go by morning. Sites will likely serve a variety of charging scenarios throughout a day. We recommend that the program not mandate size considerations, and let the market work it out for their specific duty cycles.

e) **Location recommendations and network effects**: California's drayage fleet has been singled out for an accelerated transition to ZEVs. It should therefore also receive a similar focus and support for building the necessary ZEV charging infrastructure. Drayage charging needs will be different than much of the other Medium Duty and Heavy Duty use cases (while there will also be overlaps and some ability to share infrastructure). Drayage charging needs to be 1) at or near ports; 2) on typical routes to distribution centers; and 3) associated with overnight parking of class 8 trucks. We recommend that FCI design consider the prioritization of fleets that have been singled out for accelerated transition.

f) **Recommendations for treatment of sites capable of both LD and MHD vehicle charging.** A big consideration here is safety: it is not optimal to mix LD and HD at the same facility. At a minimum you'd want separate ingress and egress, which would add cost and complexity from a design consideration. Apart from that, CCS works across the board, and MCS, when it is available, would be just for MHD.

g) **Expected capital and operational expenses to MHD stations.** Unlike LD vehicle charging outlets that can be installed on existing parking lots at supermarkets and coffee shops, heavy duty vehicles will need dedicated sites for charging. Much of the charging will have to be sited on large plots of land in or near urban areas, with access to power – these plots are rare and pricey. For this reason, we ask that the cost of the land be included in the capital expenditures paid back through the FCI program. We also recommend that the cost of the associated solar and battery storage integral to the charging stations be considered in the capital expenditures paid back through the FCI program as well. For charging equipment, below 180 kW charging costs and expenses should be similar when normalizing for utilization. Above 180 kW, the need for liquid cooled lines will increase both capex and opex.

h) **Is MHD charging equipment life different from LD, based on increased use rates?** No. A highly used LD charger should have a similar useful life to a highly used MDH charger as they are essentially the same thing.

i) **Reform FSE for FCE**. We note that new generations of chargers will have different form factors and capabilities (e.g. multi-port-all-in-one cabinets) and FSE rules and requirements should be updated to maintain parity of support.

j) **For MHD FCI, update CI for diesel**. HD and much of MD is offsetting diesel, not gasoline, and diesel emits about 13% more carbon equivalents per gallon than gasoline. Crediting mechanisms should be updated accordingly.

We appreciate the opportunity to provide comments to this critical reform process, and look forward to collaborating on scaling ZEV solutions for California.

Yours,

Adam Browning
Boardmember, Forum Mobility