



Richard Corey
Executive Director
California Air Resources Board
1001 I St.
Sacramento, CA 95812

RE: Advanced Clean Trucks Rule – 15-day Modifications to the Proposed Regulation Order

Dear Mr. Corey,

We are writing to express our general support for the Advanced Clean Truck (ACT) Rule, which we think will go a long way to continuing California’s incredible leadership on advancing vehicle technology, greenhouse-gas (GHG) emission reductions, improving air quality, and creating jobs. The ACT is a crucially important regulation that will have major global significance. Governments around the world are paying close attention, and many are likely to follow the Air Resources Board’s (CARB) policy lead. This therefore makes it critical that CARB, mindful of its role as a global leader, takes the time necessary to ensure the rule is structured to best succeed in the highly segmented commercial vehicle space.

We support the strong ambition of this rule. Based on our work in California, nationally, and globally through the Global Commercial Vehicle Drive to Zero (Drive to Zero) program, we also believe the rule will best achieve its goals as part of a broader and more comprehensive policy and investment structure. To send the complete market signal needed it is crucial that CARB concurrently commits to developing purchase requirements for fleets. Fleet rules will provide clear directional signals to vehicle buyers, as well as guarantees to manufacturers that the market for zero-emission trucks will materialize. Additionally, CARB’s regulations will most likely succeed if accompanied by other key policies, such as robust purchase incentives, and commitments by other state agencies to accelerate supportive infrastructure policy, including guaranteed funding for infrastructure deployment.

The extremely rapid pace of change demanded by the climate crisis and pervasive unhealthy air quality demands a comprehensive strategy of “and”, not “or”. We know that this rule will go a long way in helping the state achieve its State Implementation Plan (SIP) for NOx, which requires rapidly reducing emissions from heavy-duty trucks, in particular. Moving this rapidly means CARB should not consider promulgating regulations or incentives or fleet rules as separate policies—market transformation requires an “ecosystem” of regulations, incentives, and other policy direction. These are the very “ecosystem” recommendations CALSTART’s Drive to Zero program is providing to regions around the world who we hope may adopt ACT-like rules.

**Clean Transportation
Technologies and Solutions**

www.calstart.org

Board of Directors

Mr. John Boesel
CALSTART

Mr. Jack Broadbent
Bay Area Air Quality
Management District

Ms. Nicole Faulk
Georgia Power

Ms. Dawn Fenton
Volvo

Mr. Yuri Freedman
Southern California Gas
Company

Ms. Karen Hamberg
Westport Fuel Systems

Ms. Colleen Jansen
ChargePoint

Mr. Wayne Nastri
South Coast Air Quality
Management District

Mr. Scott Phillippi
United Parcel Service

Ms. Katie Sloan
Southern California Edison

Mr. Chris Stoddart
New Flyer of America

Mr. Stephen Trichka
BAE Systems

Ms. Cynthia Williams
Ford Motor Company

OFFICES IN :

48 S. Chester Ave PASADENA, CA 91106 | 1607 Cole Blvd. LAKEWOOD, CO 80401 | 67 35th St. 3rd floor Ste C356 BROOKLYN, NY 11232 | 510 W. Kearney Blvd Suite 105
FRESNO CA 93706 | 2600 Tenth Street, Suite 407, BERKELEY, CA 94710 | 200 E. Big Beaver TROY, MI 48083 | 5000 S. Airport Way, Ste 208 STOCKTON, CA 95206

Incentive funding will be very important to this regulation's success and the implementation of the beachhead strategy, as discussed in detail below. We recognize that CARB does not have control over budget appropriations to programs like HVIP, and CALSTART is committed to collectively working to persuade the legislature and the Governor to provide the sustained multi-year funding that will help fleets make the transition to zero-emission medium-and heavy-duty vehicles (MHD-ZEVs), and give manufacturers certainty that buyers will be able to afford the new ZEVs they are bringing to market. Under the expedited timing of this rule, it is very important to ensure that the initial cost difference of ZEVs can be at least partially offset by state incentives.

Our support for this regulatory process does come with certain reservations regarding the workability of the expedited timeframe proposed in the 15-day changes for specific segments, as well as concerns regarding whether some of the details contained within the rule have been given adequate time for consideration. Our comments here are also expressly informed by the current fiscal and workplace constraints caused by the Covid-19 crisis.

Introduction

CALSTART is an internationally recognized clean transportation technology consortium, with over 250 members all dedicated to the growth of the clean transportation industry. CALSTART works with the public and private sectors to drive innovation in clean vehicles and mobility. Our membership is comprised of vehicle manufacturers, parts and components manufacturers, infrastructure providers, fleets, low carbon fuel producers, investors, and more. CALSTART has seven offices across the U.S.

CALSTART's Drive to Zero is a strategic international initiative designed to catalyze the growth of the zero-emission (ZE) and near-zero-emission medium- and heavy-duty vehicle sector, focused on key beachhead segments, from transit to semi-trucks. Over 80 Drive to Zero pledge partners promise to collaboratively put in place supporting mechanisms to speed the early market for these vehicles and equipment. The beachhead strategy, adopted by CARB a key aspect of the Heavy-Duty Investment Plan, is a core principle of Drive to Zero. The strategy is built on the concept of focusing investments and policies on those targeted applications – starting with a first successful “beachhead” – and then building out follow-on applications as technology is transferred and component volumes increase. Beachhead applications were selected based on their ability to best make early use of zero emission technologies based on duty cycle, business case, industrial capacity, and performance.

Our comments are informed by the deep knowledge of not only our staff, but also our 240+ members, which include leading global vehicle-makers that are highly invested in a clean vehicle future. Over the next few years, based on the beachhead strategy, CALSTART will focus on rapid

electrification¹ of urban vehicles that follow a “return to base”, known route model.

This phased, segmented, approach is a powerful framework for focusing regulation and incentives as well as guiding manufacturers where to focus their products. We know that CARB Staff has used this framework to inform this regulation; but we believe the regulation could be more effective if specifically structured around it. We also think that the ideal structure for a regulatory regime for M-HDVs would be the co-creation of fleet requirements with the regulation of vehicle sales, using a segmented approach. At a minimum, we suggest that CARB Staff imminently propose a segmented approach to fleet requirements and announce a clear timeline for the development of each.

We firmly believe that it is only through a careful and coordinated combination of incentives and regulations that an industry as significant and diverse as medium-and heavy-duty vehicles can be transformed. This has been borne out in the light-duty-vehicle market, which was beginning to rapidly transform in California, until we saw a major source of incentives disappear for many purchasers (the federal tax credit for electric vehicles) at which point sales of electric vehicles started to decline.

Comments on Overall Regulatory Framework, and the Need for Complimentary Policies

To increase its chances for success, this rule needs a suite of “wrap around” policies and investments developed not only by CARB, but also by the legislature, governor, and key state agencies. There are three primary actions that we strongly recommend be taken in concert with this rule for it to be successful:

1. Develop and adopt fleet purchase requirements that mirror the sales targets in the proposed ACT regulations built around the beachhead strategy and applications;
2. Create a ramp up to the rule via sustained and sufficient investments in incentives for the up-front costs of zero-emission trucks and the infrastructure essential to fuel these trucks;
3. Ensure that there is close coordination with CARB’s sister agencies and commitment to support the implementation of this regulation through significantly increased funding for charging infrastructure, and by enabling widespread and efficient infrastructure development.

We also see the potential for other policies adopted by CARB or local governments to support the implementation of this rule, such as the development of ZEV-only zones for delivery vehicles (for example).

¹ We use the term “electric” or “electrification” to refer to both battery-electric vehicles as well as fuel-cell electric vehicles.

Fleet Purchase Requirements

At the December 2019 ARB board meeting multiple members encouraged staff to develop fleet rules with timelines that will act in concert with the ACT. We agree that this is essential to ensuring the success of this rule. While CARB staff presented their initial ideas for fleet rule development at a workshop in February, stakeholders have not yet seen a proposal with enough specificity that allows us to understand how and when such requirements will compliment ACT. How the fleet rules are segmented can greatly affect the workability of the ACT, and we strongly suggest that fleet rules follow the beachhead strategy.

For other M-HDV classes, CARB is developing fleet rules *before* the OEM rule, and rules already adopted (Innovative Clean Transit, Airport Shuttles) took many years to develop, even though they only applied to a very small sector of the MHDV market. Because it is already mid-2020 we see a risk of the fleet mandate timeframes lagging the OEM timeframes, which could substantially undermine the successful rollout of the trucks and the ACT itself.

Incentives

Whether the state provides sufficient and consistent vehicle incentive funding could well influence whether the sales targets of this rule are met on the timelines proposed in the 15-day changes. Incentives provided efficiently through the HVIP program provide the “ramp” that make the take-off of market transformation possible by giving fleets the funding they need to become early adopters and help manufacturers reach production scale. We need coordinated and comprehensive efforts to transform this complex market. We note that many of the baseline assumptions relied upon in this rulemaking—regarding total-cost-of-ownership (TCO) and price parity over-time, were developed based upon theories of change that imply early adopters will continue to be incented.

CALSTART has developed a preliminary, internal, analysis which suggests that the regulatory targets proposed in the 15-day changes could be achieved with *rapid* ramping of sales across eight different beachhead segments. Our analysis looked at a range of ZEV sales in every beachhead from between 20-40% for the early years of this regulation, and it suggests that it is possible to achieve the ACT targets with rapid electrification across the beachheads. We must note, however, that our beachhead assumptions rely upon incentives for vehicles and infrastructure.

The transformation of the renewable energy industry during the decade from 2010-2020 provides a helpful example of how markets can be rapidly and successfully transformed: the state incentivized rooftop solar purchases and installations through the California Solar Initiative (CSI), wherein the first homeowners to install solar received very high upfront incentives, which declined as installed capacity increased. This, in combination with regulatory mandates for utilities to sign utility-scale solar contracts to meet aggressive RPS targets, brought down the price of panels to such a degree

that they are now cost competitive with grid power for consumers, and cost competitive with gas-plant contracts for utilities.

CALSTART firmly believes that the MHD-ZEV market is close to the same type of tipping point that we saw with renewables, but it is only by reaching production scale that the price of these vehicles can begin to come down. We believe that incentives will be needed to bring down initial vehicle purchase prices across *most* segments for at least the next 5-6 years if fleets are to dramatically change their purchasing patterns on a very short time-frame.

To date, it seems uncertain whether the Governor and Legislature will appropriate funds to the HVIP program for FY 2020-2021. If there are only incentives for 1,000 or less vehicles total per year across all MHDV classes, or potentially no incentives at all, ZEV production may not reach the needed economies of scale to support 20-33% ZEV sales penetration for the beachheads by 2025. In other words, if vehicle purchases don't meet expectations in the next two-years, we could pass a critical window of feasibility for the timelines in this rule.

The development of federal incentives could be game-changer for this industry and remove the pressure of California being the sole source for driving down the price of vehicles and proving their field-readiness. CALSTART is actively working towards a federal incentive, but it is hard to predict the outcome or the timing.

Regulatory Coordination on Infrastructure with “Sister” Agencies

California needs a coordinated vision and plan to execute on MHD-ZEV goals across all agencies. The barriers presented by charging infrastructure are real and go beyond just the (very real and significant) need for public incentives to assist fleets with their charging/ fueling investments. Obviously, the up-front costs of EV charging or H2 fueling infrastructure for a heavy-duty truck should not be minimized and pose a significant barrier. Many fleets in California will be supported with the electric utility side “make-ready” infrastructure by one of the three large investor-owned-utilities, but, this does not apply uniformly across the state, and there are other costs beyond what may be borne by the Investor-Owned-Utility (IOU) programs. We are concerned that CARB staff seems to be de-emphasizing the fact that approx. 20% of the state's load is served by municipal utilities, and so 20% of fleet customers may not have access to these make-ready programs.

For EV charging, customer side infrastructure (chargers, trenching, conduit, etc.) is a significant cost, and one for which we really don't have a robust data-set to draw from to estimate costs. CALSTART often uses a ballpark of \$50-\$75,000 for a HD vehicle that requires DC-FC, but really this number may be quite low. With only approximately 1000 M-HD-ZEVs delivered to date in California, we have the most experience with is transit buses, yet these infrastructure costs seem to vary greatly from property-to-property. Many of the long-range trucks we expect to see coming to market in

the coming years could require chargers of over 200kW, technology that is very rare today, and so costs are very much an unknown.

This rule will require the California Energy Commission to move rapidly to support MHDV infrastructure, and to estimate, and then develop a plan to meet, the amount of funding needed to support this rule. has announced its commitment to a MHDV charging/ fueling infrastructure incentive program, but as of the date of these comments, that program has not been approved or established. CARB cannot presume that it will exist or make an estimate of what % of the charging cost for ZEVs under this rule could be covered by that program. This means that, if proceeding with this rule, it is absolutely critical that CARB coordinate very closely with the CEC, that the CEC acknowledge formally its commitment to support this regulation through its infrastructure programs, and to what degree, and for how long. CEC may also need to consider re-designing the Cal-eViP program to accommodate work trucks (class 2b-3) since many of them will not be charged at workplaces but rather at homes.

All of that aside, cost is not the only barrier related to infrastructure that the state's leadership needs to help solve, and this is why we recommend that CARB develop formal structures for coordinating with the CEC and the CPUC to ensure that all three agencies are working in concert on infrastructure goals and programs. For example, only the CPUC can solve challenges related to MHDV charging interconnection for IOUs, or allocate more funds if we find that the existing \$600M allocation for MHDV make-ready will run out of funds in the coming years due to increased demand from the ACT.

This rule will also require that the CPUC ensure that planning to allow fleets to rapidly acquire ZEVs, consistent with the ACT and yet to be developed fleet rules, is a *key component* of IOU transportation electrification plans. We should not underestimate the herculean efforts that utilities will need to undergo to scale California from 1,000 MHD-ZEVs to more than 10,000 MHD-ZEVs in five years. We strongly recommend that the CPUC adopt policies formally supporting the timelines laid out in this proposed regulation, and that CARB does its best to ensure that the CPUC oversees IOU planning to be consistent with this rule, to provide the greatest guarantees possible that fleets will be able to purchase vehicles, as well as charge and fuel them, on these timelines. One issue remaining to grapple with is that IOU programs have historically not reached small fleets/ independent contractors, such as those who would need to purchase Z-E class 2b-3 work trucks.

Other Issues Not Raised in the Rulemaking

Development of Regulatory "Checkpoints"

CALSTART supports comments of others who are concerned that, whenever forging completely new territory and getting out ahead of the rest of the world with regulations, it is wise to build in some "checkpoints" to verify that the universe of assumptions made when the rule was adopted are

panning out as expected. The coronavirus pandemic is a perfect example of why such “checkpoints” are needed when designing a new regulation for a huge industry on an ambitious timeframe: some circumstances arise that cannot be predicted, and others arise that perhaps were quite predictable. Extended factory closures are certainly the type of event that should require regulators to pause and re-consider timelines. Other examples we can think of are: if infrastructure barriers are not being solved as quickly as we anticipated, or, if the *only* manufacturer of a certain class of ZEV goes out of business, or is purchased by another OEM that no longer wants to produce that vehicle, for example.

If a national market doesn’t emerge in short order, many OEMs could be making vehicles only for the CA market, which would certainly be much less efficient. Also, if CARB isn’t able to adopt fleet regulations on a complimentary timeline, or if these regulations do not cover large segments of the market, this could lead to issues down the line that CARB may need to re-evaluate through this regulation.

Therefore, we suggest it would be highly prudent if CARB builds some “checkpoints” into the regulation at specific milestones to assess the market, and also to assess whether CARB staff’s assumptions regarding TCO, vehicle suitability to various vocations, and the timing, cost and availability of infrastructure have borne out. If they have not, such salient changes in conditions should trigger a review of the regulation and timing, thus ensuring the workability of the rules while also keeping the regulation out of the legal process.

Further Segmentation Consistent with the Beachhead Strategy

CALSTART agrees with what we understood to be the CARB board’s direction, provided in December 2019, that the ACT regulation should take a more segmented approach by further separating the weight classes, and increasing the percentages for certain segments consistent with the beachhead strategy. We shared in our earlier comments our perspective that segmentation would be beneficial to the ACT and to the fleet rules. Based on our internal analysis, we find that segmentation could allow CARB to set really ambitious, yet achievable targets for each beachhead that correspond directly to a specific fleet segment. We find that there are vehicle segments that are *technologically* ready to scale to high percentages of annual sales in the next five years. We are concerned that the broad nature of the ACT groupings do not send appropriate signals to industry. We urge CARB staff to consider the value of additional segmentation to add clarity to the goals of this regulation and to also strongly inform an effective fleet rule structure.

There would be good precedent for such a design. Since 2017, CARB has followed an increasingly successful strategy for technology commercialization based on targeting its investments on strategic “beachhead”, or first-success, applications and on the pathways for additional application markets that extend from them. These beachheads are built around applications that can best make early use of one of the pathway technologies based on duty cycle, business case, industrial capacity,

and performance. From this foothold, the beachhead process then can grow in impact by the extension of technologies to adjacent markets through the leveraging and adoption of similar powertrains, the growth of supply chain volumes for common components, expansion of fueling infrastructure and confidence in performance and business case grows. With growth, eventual price reductions based on production scale can expand the technology to other markets and off-road applications. CARB's incorporation of these strategies into the ACT rule would help further align policy and market development, aiding the ability to quickly get to scale and reduce costs.

Complimentary Policies – ZEV zones

Although they were raised by CARB Staff at the fleet rules workshop in February, we do not see a mention in the 15-Day modifications referring to the development and adoption of “zero emission vehicle only” zones as a complimentary policy. The designation of zero-emissions zones, which create areas within cities/ urban regions that only allow ZEVs, have become a very powerful tool in Europe, and ten European cities either already have ZEV zones or are implementing them at present. Indeed, The Netherlands is developing ZEV zones in more than 30 of its cities, in addition to the one now in Amsterdam. These zones have sent powerful signals to fleets and manufacturers in Europe, and the zone requirements are aligning closely with the stringent carbon reduction standards in Europe for trucks. We strongly believe that well-located urban ZEV zones could go a long way to increasing rapid market penetration of ZEVs in California and could align closely with needed fleet rules. The reason for this is clear: the key beachhead applications most ready for zero emissions technology are highly aligned with suburban and urban region duty cycles. Such regions also face the biggest impacts from air quality, precisely driven by emissions from MHDVs.

Targeting zero emission zones for urban California regions would have the benefit of spurring adoption and use of vehicles most conducive to electrification where unhealthy air quality persists. Such directed guidance could be an extremely valuable complimentary policy that CARB should consider.

Detailed Comments on 15-day Modifications

Change in Requirements for Class 2b-3:

We find the changes to this segment to be some of the most significant between the 45-day and 15-day proposal. In particular, including pickups in calculations pre-2027 points to a tough path ahead for this segment. At present, it is unclear to us whether any of the full battery-electric pickups currently in development/ early production will provide substitutes for the present fleet of class 2b and 3 work trucks.

We also note, the TCO analysis for the class 2b-3 still appears to be using what we believe are unrealistically small battery sizes (55kWh 80kWh), as raised earlier by Dr. Sperling. We observe that many of the popular light-duty passenger vehicles have battery sizes larger than 55kWh, and these

vehicles are not designed to carry heavy loads or to tow cargo. We understand that manufacturers of light-duty electric pickups plan for batteries in some cases exceeding 120 kWh, and their expected price tag reflects this.

Other discrepancies we feel important to note here, include that the TCO for class 2b-3 still assumes all these vehicle operators will earn LCFS credits, when we understand that the analysis similarly shows that a vast majority of work trucks will not be owned by a “fleet” and therefore, will not be charging centrally, and their credits will be earned by utilities and reflected as “residential” charging. Many of these issues are evident in CARB’s market segment analysis (February 2019). We are concerned that because fleet mandates also won’t capture small businesses/ single owner operators, a big part of 2b-3 market will not fall under fleet rules, thus achieving these aggressive targets seems to be at risk.

CALSTART’s internal analysis shows that achieving early 2b-3 requirements will be aided by rapid adoption of ZEV cargo vans. Relatively few ZEV cargo vans in class 2b-3 have been sold to date, but we believe they are a great candidate for electrification. It just remains to be seen if they can ramp up production and scale this quickly in the next 3.5 years.

Change in Requirements for Tractors:

CALSTART is excited to see major OEMs and start-up manufacturers developing trucks that fit in this category. While we expect small numbers of class 7-8 tractors available in 2021, we expect them to be used for regional haul and not long haul. We predict that even rapid electrification of regional tractors may not lead to achieving the sales percentages and timelines in the 15-day changes for years 2024 and 2027. Furthermore, we are concerned that some production timelines have already been pushed back because of the Covid-19 pandemic.

Other Miscellaneous Concerns

We find that the overall calculations of the regulation being based on “delivery to final purchaser” is problematic. We are concerned that manufacturers have little visibility into, and have no means of controlling who the final recipient of the vehicle is, and we are unclear on the necessity of diverging from standard industry practice to use point of final delivery into California.

One issue we wish to note with the overall TCO calculations: it appears that the Federal excise tax – which is a hefty 12%, is not accounted for in TCO analysis.

Conclusion

We urge CARB to be ambitious, and yet also, realistic in looking at the realm of the possible for this regulation. It would certainly be amazing to see some beachhead segments reaching sales targets of 50 or 66 percent ZEV by 2027, and we want to make sure that is possible, by working with CARB,

the legislature, and other agencies on a suite of complimentary policies to achieve a dramatic growth rate year-over-year.

As it often does, the world is watching to see what regulations CARB will adopt for zero-emission trucks, and many are likely to follow CARB's lead. CALSTART thinks it is critically important that CARB continue making progress towards the adoption of manufacturer sales targets for medium- and heavy-duty vehicles. This also makes it critical that CARB ensure that this rule balance achievability with ambition, and that the state get behind this rule with an "all hands-on deck" approach to policy implementation. CALSTART believes that rule is most likely to be successful as one part of a suite of policies that include strong purchase incentives to drive market transformation, fleet purchase requirements to ensure that there are purchasers for the ZEVs the OEMs are developing now, and the commitment by other state agencies to implement supportive infrastructure policy.

We are very appreciative of your consideration of our comments.

Sincerely,



Meredith Alexander, J.D.
Policy Director
CALSTART
malexander@calstart.org