October 15, 2019 | Submitted Electronically

Mr. Jack Kitowski, Division Chief
Mr. Tony Brasil, Branch Chief
Mr. Craig Duehring, Manager
Mr. Paul Arneja, Air Resources Engineer
Mobile Source Control Division
California Air Resources Board
1001 I Street
Sacramento, CA 95812

RE: Comments on Proposed Advanced Clean Trucks (ACT) Regulation

Dear Mr. Kitowski, Mr. Brasil, Mr. Duehring and Mr. Arneja,

The groups listed below submit these comments as a follow-up to the discussion at the August 21st workshop on the California Air Resource Board (CARB) proposed Advanced Clean Truck Rule. The broad participation by numerous community, environmental justice, health and labor groups at that workshop should have demonstrated the importance of this rule and the strong support for a more ambitious proposal. We continue to believe that the draft proposal falls far short on both what is possible and what is needed. We urge staff to strengthen the proposal by:

(1) Increasing the overall mandates to ensure that by 2030 no less than 15 percent of medium and heavy-duty trucks on the road are zero-emitting;

(2) Including Class 2b pickup trucks in the mandates beginning in 2024;

(3) Outlining CARB's longer-term objectives for achieving 100 percent zero-emission trucks in various categories, and explaining how this phase of the rule is consistent with those objectives in attaining federal and state air quality and greenhouse gas objectives; and

(4) Committing to adopt corresponding fleet purchase requirements in 2021.

Increasing the overall mandate for more zero-emission trucks on the road is critical for California to finally meet healthy air quality standards, especially in disproportionately impacted environmental justice communities. There are multiple ways to achieve a 15 percent on-the-road target. The table below outlines one scenario. The point of these figures is not to prescribe a particular set of mandates (for example, as discussed further below, we think the targets in the Class 7-8 tractor category could even be stronger), but to show there are feasible pathways to achieving a much larger number of trucks on the road by 2030 than CARB has currently proposed. For comparison, we have included our calculation of the sales numbers that would be required under the draft proposal (*[##]*). As detailed below, available evidence demonstrates that the draft proposal's sales numbers are woefully low, and that a stronger alternative is well within reach.

Model Year	Class 2b-3 (including pickup trucks)	Class 4-8 Vocational/Straight Trucks	Class 7-8 Tractors	Yearly Zero-Emission Sales	Zero-Emission Vehicles On Road
2024	15% (11,235) *[747]*	30% (6,275) *[1,464]*	10% (608) *[182]*	18% (18,117) *[2,393]*	1.0% (18,117) *[2,393]*
2025	23% (16,852) *[1,245]*	38% (7,844) *[1,883]*	13% (810) *[304]*	25% (25,506) *[3,431]*	2.3% (43,624) *[5,825]*
2026	30% (22,469) *[1,743]*	45% (9,413) *[2,301]*	17% (1,013) *[425]*	32% (32,895) *[4,469]*	4.1% (76,518) *[10,294]*
2027	38% (28,086) *[6,741]*	53% (10,982) *[2,719]*	20% (1,215) *[547]*	40% (40,283) *[10,007]*	6.3% (116,802) *[20,300]*
2028	45% (33,704) *[8,239]*	60% (12,551) *[5,020]*	23% (1,418) *[668]*	47% (47,672) *[13,927]*	8.8% (164,474) *[34,228]*
2029	53% (39,321) *[9,737]*	68% (14,120) *[7,740]*	27% (1,620) *[790]*	54% (55,061) *[18,266]*	11.8% (219,534) *[52,494]*
2030	60% (44,938) *[11,235]*	75% (15,689) *[10,459]*	30% (1,823) *[911]*	61% (62,449) *[22,605]*	15.1% (281,983) *[75,099]*
Cumulative sales	38% (196,605) *[39,685]*	53% (76,874) *[31,586]*	20% (8,505) *[3,827]*	40% (281,983) *[75,099]*	---

California Needs A Stronger Zero Emissions Truck Rule

Our previous letter outlined the multiple reasons that a stronger rule is required, including: (1) the need for greater emission reductions to meet health-based national ambient air quality standards and achieve the commitments in state and local air quality plans; and (2) the need for more zero-emission drayage trucks to be built to satisfy the commitment in the San Pedro Port's Clean Air Action Plan to transition all of the roughly 17,000 trucks servicing the ports to zero-emission trucks by 2035.

On this latter need, new research underscores the importance of a much stronger CARB rule. A study by the UCLA Luskin Center finds that because of an anticipated bump in truck retirements, due to natural turnover and the State Truck and Bus Rule's 2023 deadline, the Ports "have a significant opportunity for early [zero-emission] adoption."[1] They estimate that more than 4,500 trucks could retire in 2022, and the majority of the remaining trucks will turnover later in the 2020s. Rather than rely on two sharp fleet transitions—first to natural gas and then to zero-emissions—the Ports can "leapfrog" directly to a [zero-emission]-majority fleet in the early 2020s. In doing so, they can avoid the substantial investments in natural gas trucks, fueling infrastructure, and operator training that would largely end up stranded.

This best-case scenario for the Ports, and the low-income and minority communities living adjacent to them, can be realized only if manufacturers are compelled to begin earlier action through a stronger sales mandate. The rule may not be able to directly induce the trucks necessary for the first batch of truck turnover before 2024, but strong early targets matched with the incentive to bank credits would still enable a significant portion of Port drayage operations to

[1] https://innovation.luskin.ucla.edu/wp-content/uploads/2019/08/Zero-Emission_Drayage_Trucks.pdf at 5

be supplied with zero-emission vehicles, and ensure that they are available when more are due to turnover in the late 2020s.

Since our June letter, the commitments tied to a zero-emission truck future continue to build. For example, the City of Los Angeles has committed to ensure 100 percent of the city's medium duty trash and recycling trucks are zero emission trucks by 2028.[2] The West Oakland Community Action Plan recently approved by the Bay Area Air Quality Management District similarly depends on CARB adopting a strong Advanced Clean Truck rule to support transitioning the 6,000 drayage trucks servicing the Port of Oakland to zero-emissions.[3] CARB's proposed trajectory is insufficient to support this growing list of commitments that depend on the availability of zero-emission trucks.

CARB itself has acknowledged that strengthening the proposal to achieve a 10 percent target for zero-emission trucks on the road in 2030 would nearly double the nitrogen oxide and fine particulate matter emission reductions in 2031 compared to the proposed rule, and would result in an additional $3 billion in avoided health costs ($8.6 billion versus $5.5 billion).[4] These incremental benefits outweigh the incremental cost differential between this stronger alternative and the proposed rule. As a result, the analysis concludes that the stronger alternative would be more cost-effective than the draft proposal.[5]

We know that California needs the emission reductions that would be provided by a stronger rule to meet air quality standards and greenhouse gas reduction goals. Disadvantaged communities across California are disproportionately harmed by air pollution from the trucks covered by this rule. The health benefits from a stronger rule are undeniable and long overdue. In fact, CARB's own analysis shows that the benefits of a stronger rule would more than offset the additional costs, and that a stronger rule would be more cost effective in reducing emissions than the current proposal. Yet CARB's Standardized Regulatory Impact Assessment rejects this superior alternative based on unsubstantiated "questions" about feasibility. None of these concerns is supported by the record.

CARB's Feasibility Concerns Are Unreasonable

CARB rejects a 10 percent target for 2030 claiming that the stronger alternative doubles the cumulative number of zero-emission trucks sold between 2020 and 2040 with the increased sales

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[2] LA's Green New Deal, at 145 (2019) (available at: https://plan.lamayor.org/sites/default/files/pLAn_2019_final.pdf).

[3] http://www.baaqmd.gov/~/media/files/ab617-community-health/west-oakland/100219-files/final-plan-vol-1-100219-pdf.pdf?la=en at 6-24.

[4] http://www.dof.ca.gov/Forecasting/Economics/Major_Regulations/Major_Regulations_Table/documents/SRIA-Advanced_Clean_Truck_080819_DOF.pdf

[5] *Id.* at 81.

occurring in the Class 2b-3 and Class 7-8 tractor categories.[6] CARB claims that the current scarcity of commercial vehicle deployments in these categories, and concerns about payload, range, towing, charging/refueling infrastructure justify rejecting a stronger target. Again, none of these conclusions are reasonable.[7]

First, achieving a stronger 2030 target is not limited to the Class 2b-3 and Class 7-8 tractor categories. As shown in the table above, which is just one scenario for achieving our proposed 15 percent target, over 20 percent of the additional trucks would come from the Class 4-8 straight truck category. Only 2 percent of the additional trucks would come from the Class 7-8 tractor category. The remainder would come from the Class 2b-3 category.

The stronger proposed targets are based on CARB's own analysis of the readiness of different truck categories for electrification. There are 48 categories of trucks that are already primed for electrification (*i.e.*, based on CARB's analysis have an "electrification suitability" of 1 or 2). The annual sales in these categories are roughly 38,000 trucks per year. Electrifying just these categories could nearly achieve the stronger targets proposed.

Moreover, stronger targets can be met with trucks beyond those CARB identified as primed for electrification. For example, we have seen a suite of new announcements in the refuse truck sector. BYD has orders for over 700 electric refuse trucks worldwide (China[8], Brazil[9]) and has rolled out trucks in three U.S. cities (Palo Alto[10], Seattle[11], and Carson[12]), including repeat orders. GreenWaste, the City of Palo Alto's refuse contractor, has announced plans to run its entire residential fleet on electric vehicles.[13] Mack is close to final commercialization of its refuse truck, testing it in New York City[14] and announcing an order with Republic Waste Services.[15] Peterbilt has an electric refuse truck in demonstration, customer testing, and

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[6] *Id.*

[7] *Id.*

[8] https://cleantechnica.com/2018/05/16/byd-lands-deal-for-500-electric-refuse-trucks-with-two-companies-in-shenzhen/

[9] https://cleantechnica.com/2018/05/22/byd-inks-deal-for-200-electric-refuse-trucks-in-indaiatuba-brazil/

[10] https://en.byd.com/news-posts/press-release-public-private-partnership-to-electrify-waste-expo/

[11] https://arstechnica.com/cars/2019/05/seattle-makes-history-with-electric-garbage-truck/

[12] https://www.waste360.com/trucks/byd-wrt-and-amrep-launch-electric-refuse-truck-carson-calif

[13] https://en.byd.com/news-posts/press-release-public-private-partnership-to-electrify-waste-expo/

[14] https://electrek.co/2019/05/08/mack-electric-garbage-truck/

[15] https://www.macktrucks.com/mack-news/2019/mack-trucks-to-provide-republic-services-with-fully-electric-mack-lr-refuse-model/

validation.[16] The Canadian start-up Lion just announced an electric refuse automated side loader with 250 miles of range.[17] Vancouver, Canada just committed to electrify 200 vehicles by 2021, including refuse trucks.[18] Waste Management just deployed its first electric refuse truck in Melbourne, Australia.[19] By 2024, battery electric trash truck sales alone could satisfy a large portion of the proposed Class 4-8 sales mandate.

All of this activity in refuse trucks is happening in a category of trucks that CARB does not even rank as the most readily suitable for electrification. The fact that we are seeing this much activity in "less suitable" categories reinforces the conclusion that higher sales targets are absolutely feasible.

The same is true in the Class 7-8 tractor sector. A report prepared by Atlas Public Policy reported that as of early 2019, there were already over 16,000 electric trucks on order or pre-order in the U.S.[20] Most of this tally comes from the 14,000 pre-orders of Nikola's Class 8 tractors.[21] Notably, the Atlas report does not include any orders for Daimler or Volvo, who are both ramping up their electric truck manufacturing.[22] Volvo Trucks North America announced the battery-electric version of their VNR Class 8 regional hauler is slated to go on sale at the end of 2020[23] while Daimler has already put its electric Freightliner eCascadia Class 8 in service in California.[24]

Some of the fleets already making significant commitments to zero emission trucks include:

- **Anheuser-Busch InBev**. The company announced orders for 840 electric and hydrogen semitrailers as part of its commitment to power 100 percent of its directly operated delivery vehicles with renewable energy by 2025.[25] Anheuser-Busch also

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[16] https://www.ttnews.com/articles/peterbilt-unveils-electric-medium-duty-truck-ces

[17] https://www.truckinginfo.com/333278/lion-electric-boivin-evolution-unveil-all-electric-waste-collection-truck

[18] https://vancouver.ca/green-vancouver/green-fleets.aspx

[19] https://thedriven.io/2019/05/24/australias-first-fully-electric-rubbish-trucks-clean-up-in-casey/

[20] https://www.atlasevhub.com/resource/electric-trucks-and-buses-overview/

[21] https://www.freightwaves.com/news/equipment/early-adopters-believe-in-nikola-hydrogen-electric-truck

[22] https://daimler-trucksnorthamerica.com/influence/press-room/PressDetail/dtna-ceo-declares-path-to-zero-emission-2019-04-24; https://www.electrive.com/2019/02/20/first-fully-electric-volvo-trucks-delivered/

[23] https://www.truckinginfo.com/341895/volvo-to-start-selling-electric-class-8-truck-here-at-end-of-2020

[24] https://www.trucks.com/2019/08/21/daimler-puts-first-ecascadia-electric-trucks-in-service/

[25] https://www.trucks.com/2018/05/03/anheuser-busch-nikola-truck-order/

ordered 21 second generation BYD 8TT Class 8 electric trucks and is expected to take delivery by end of this year.[26]

- **IKEA**. In 2018, at California's Global Climate Action Summit, IKEA CEO Jesper Brodin announced a commitment to using EVs for the last-mile portion of all of its product shipments by 2025. Now the Swedish retailer says it has already electrified all its local delivery vehicles in Shanghai, and plans to do the same in Los Angeles, New York, Paris and Amsterdam by 2020.

- **Penske and NFI**. Daimler has delivered two Class 8 eCascadia electric trucks to Penske and NFI in California and intends to deliver 30 eM2 electric trucks in North America by the end of 2019 as part of its Innovation fleet.[27]

- **PepsiCo**. The company announced that it will deploy 15 heavy-duty Tesla battery electric tractors, six Peterbilt 220EV battery electric box trucks, and three BYD 8Y battery electric yard tractors as part of its goal to replace all of its existing diesel-powered freight equipment with zero- and near-zero emission technologies at its Modesto, California site.[28]

Indeed, just the demand for replacing the over 20,000 Class 7-8 drayage tractors servicing California's ports would exceed the stronger Class 7-8 tractor scenarios offered by commenters. There is little doubt that these stronger targets, which would achieve roughly 8,000 zero-emission trucks on the road, are eminently feasible if not conservative.

The biggest difference between a strong proposal and CARB's current proposal is in the Class 2b-3 category. But even here, CARB's general concerns – tied to the regulation of pickup trucks – are overblown. First, a greater deployment of zero-emission trucks in this category is feasible even without requiring any electrification of pickup trucks. There are annual sales of over 20,000 Class 2b-3 vehicles in categories CARB ranked as "1" or "2" for electrification suitability – none of which are pickup trucks. CARB's current proposal peaks at 15 percent of Class 2b-3 sales in 2030 and would represent sales of just 11,300 zero-emission vehicles out of the 75,100 total annual sales in this category.

CARB's broad concern *vis* pickup trucks assume edge case assumptions around payload, range and towing (e.g., the work truck that tows a boat to the mountains on the weekends). The stronger proposal offered by commenters would not require electrification in these edge cases. To the contrary, the proposal would require electrification of less than 15 percent of the pickup trucks on the road by 2030. Many of these pickup trucks belong to public fleets or are part of

[26] https://www.trucks.com/2019/10/07/anheuser-busch-frito-lay-start-building-electric-trucks-fleets/

[27] https://www.ttnews.com/articles/first-electric-freightliner-ecascadia-models-enter-freight-operations-nfi-penske

[28] https://www.trucks.com/2019/10/07/anheuser-busch-frito-lay-start-building-electric-trucks-fleets/

commercial private fleets that have predictable and limited use patterns. The US EPA's MOVES model estimates that for class 2b-3 vehicles, 64 percent of vehicle miles traveled (VMT) by diesel powered and 27 percent of VMT by gasoline powered vehicles are by commercial vehicles.[29] It is not reasonable for CARB to reject a proposal that would require electrification of only a small portion of the overall pickup trucks on the road based on worst-case scenarios while the vast majority of use cases are feasible. CARB should focus on those cases where electrification is feasible and not the exception.

CARB's conservative approach is particularly unreasonable in light of the likely overcompliance that will occur in the other categories of trucks. The most recent announcement that Amazon will deploy 100,000 electric delivery vans by 2024[30] promises to swamp CARB's entire proposal. It is unclear whether these will be Class 3 or Class 4 delivery vans, but with the credit trading scheme in the proposed rule, the weak Class 2b-3 targets will be met easily. Indeed, without a stronger rule, Rivian alone could generate enough credits to delay investments by other manufacturers for years.

The Amazon announcement, along with the other announcements that have continued to roll out in the time this rule has been under consideration, are consistent with the overall projected growth in the electric truck market. Excluding China, the global truck market grew by 63 percent in 2018.[31] The market is expected to continue to rise at a compound annual growth rate of 15 percent through 2023.[32] In the meantime, average battery prices are continuing to drop at a rapid pace. Prices have dropped 85 percent from 2010 to 2018 to $176/kWh for auto battery packs. The price is expected to drop an additional 46 percent to about $94/kWh by 2024 and to $62/kWh by 2030.[33] Industry analysts have predicted that with these price drops, "the penetration rate in price-sensitive applications like electric trucks and off-highway vehicles may soar."[34] Decreasing battery costs, reduced vehicle costs due to economies of scale, and increased competition will all result in lower vehicle costs and improved total cost of ownership driving increased adoption so long as manufacturers are making sufficient volumes of trucks to meet this growing demand. Unfortunately industry has shown time and again a reluctance to provide consumers with what they want without robust zero-emission vehicle mandates. Moreover, mandates in China, the EU and many other countries for zero-emission trucks will drive truck makers to accelerate development of these vehicles to remain competitive in those markets, but will mean deployment is prioritized elsewhere. It is critical that this rule help drive those investments and bring these zero-emission trucks to California.

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[29] https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100O7VJ.pdf at 125.

[30] See https://arstechnica.com/cars/2019/09/amazon-orders-100000-electric-trucks-to-fight-climate-change/ (noting that CEO Jeff Bezos announced that vehicles would be fully deployed by 2024).

[31] https://www.interactanalysis.com/battery-electric-truck-market/

[32] https://www.marketresearchfuture.com/reports/electric-truck-market-6261

[33] https://about.bnef.com/blog/behind-scenes-take-lithium-ion-battery-prices/

[34] https://www.interactanalysis.com/the-lithium-ion-battery-market-infographic/

A Stronger Rule is Feasible and Necessary

This rule must set targets not based on where we are but where we need to go. There is no dispute that California needs to electrify its transportation sector, and that electrification of trucks will provide massive benefits to the State and its most impacted communities. At every step, CARB's predictions on the feasibility of truck electrification have been overtaken by events. Vague concerns about the ability of electric trucks to satisfy worst-case scenarios cannot justify rejection of targets that even CARB recognizes would be more cost-effective in addressing our pollution problems. Strong targets will create strong market signals that will result in faster investment that will in turn bring down costs more quickly. Additionally, electrifying trucks can help generate high-quality jobs, skilled training opportunities and new investments in California's economy. For example, statewide training initiatives like the Electric Vehicle Infrastructure Training Program are already preparing California electricians for the shift to clean transportation technologies. CARB's proposal risks undermining these positive feedback loops and significantly delaying the transition to a zero-emissions transportation future. We urge staff to reconsider its draft proposal and release a stronger version later this month.

Sincerely,

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