December 9, 2019

Mary Nichols, Chair

California Air Resources Board

1001 I Street

Sacramento, CA 95814

RE: Comments on Proposed Advanced Clean Truck Regulation

Dear Chair Nichols and Members of the Board,

The Volvo Group appreciates the opportunity to comment on the proposed Advanced Clean Trucks (ACT) regulation by the California Air Resources Board. We support CARB’s interest in reducing greenhouse gas and NOx emissions in the state of California as well as the desire to accelerate the introduction of heavy-duty zero emission vehicles (HD ZEVs) in the marketplace as a means of achieving its goals. However, we fear that the currently proposed rule will undermine the realization of these goals, resulting in negative economic and environmental impacts for the state of California.

The Volvo Group is one of the world’s leading manufacturers of trucks, buses, construction equipment and marine and industrial engines. The Group also provides complete solutions for financing and service. The company, which employs some 100,000 people worldwide, has production facilities in 19 countries and sells products in more than 190 markets. In the United States, it employs more than 15,000 people and has nine manufacturing plants in six states. In California, the Volvo Group and its dealers employ over 1,000 people with locations in Mountain View, Costa Mesa, Corona, Haywood, Fontana, Stockton, Fresno and La Mirada. The Volvo Group is the only major truck manufacturer that produces all of its vehicles for the U.S. market in the U.S.

**Overall Comments**

California has been eager to support the introduction of ZEV vehicles in the California marketplace and the improvements in battery technology over the last few years has led major OEMs to pursue the development and commercialization of battery electric heavy-duty trucks. Volvo has spent hundreds of millions of dollars and worked with a multitude of stakeholders to successfully launch its all electric Volvo FL and FE model trucks into the European market.

In North America, Volvo is currently cooperating with 15 partners in the CARB-funded Volvo LIGHTS project to homologize this technology into products for the U.S. market. We are convinced that BEV heavy-duty trucks will eventually meet the reliability and cost effectiveness needs of U.S. fleets and have committed to a low volume commercial product offer before the end of 2020. Nevertheless, we are seriously concerned that passage of the proposed Advanced Clean Truck regulation, without additional actions to support the marketplace, will undermine the state’s efforts and slow the adoption of these vehicles, both in California and throughout the U.S.

Heavy duty truck customers, unlike light-duty vehicle purchasers, evaluate and purchase these commercial vehicles based mainly on return on investment and total cost of operation. As you know, our Volvo LIGHTS project will be deploying electric trucks in commercial operation within a few short months. We expect to apply critical learning and product development improvements from this project including truck operational and life-cycle cost information which is critical for customer evaluation and market adoption. The real-world lessons from this project will help us optimize our trucks for specific applications and prepare us and our customers for the commercial launch of the vehicles before the end of the project timeline. We believe a similar openness to reflection and adjustments in the proposed regulation based on the knowledge gained from the many commercial pilot projects currently underway is equally important to the success of the Advanced Clean Truck regulation. For this reason, the Volvo Group strongly urges CARB to postpone the final development and Board approval of the regulation (not the date of its implementation), or at least build some flexibility into the rule until more can be learned from the state’s current ZANZEFF investments.

In addition to the readiness of the vehicle technology, having the necessary market conditions in place will be equally important. Of these, two in particular stand out as being most critical. The first, and maybe most obvious, is the availability of sufficient charging infrastructure.

Unlike light-duty EVs, heavy-duty commercial EVs require more sophisticated infrastructure to be in place before they can become operational. While it is true that certain return-to-base operations will be best suited to control their own access to chargers, there are many underlying issues which can threaten the timeliness of their availability. These include:

* Insufficient funding for the grid upgrades and equipment installation, and
* Permitting and other local government entitlement delays given the complexity of organizations involved and their unfamiliarity with the technologies.

We are concerned that failure to better coordinate funding and planning among the many state, regional and local agencies responsible for this work could jeopardize the entire transition and adoption of these vehicles.

Another crucial factor is the continued availability of purchase incentives for fleet owners. It’s widely known that the up-front purchase price of advanced technology vehicles such as ZEVs will be substantially higher than today’s clean diesel trucks. Over time, prices can be expected to fall as technology improves and economies of scale grow, but this will take many years. Unlike the light-duty market, different buyer motivations, lower vehicle volumes and diverse market segmentation mean that the economy of scale wheels will turn much more slowly. Heavy duty trucks are each custom-built with thousands of variants resulting in millions of possible combinations. Customers optimize their specification to their exact application needs (ex: dump trucks, daycab local tractors, sleeper long-haul tractors are all very different), therefore scale benefits are divided over thousands of options resulting in higher capital costs.

HVIP funds were over-subscribed within three days of CARB’s approval of the FY19-20 budget without any major OEM class 8 ZEVs being available in the marketplace. Fleets and OEMs need confidence that these funds will have robust, multi-year funding if they are going to make investments in this new technology, rather than the uncertainty that comes from annual funding determinations.

Even if these funds are available, there are further complications that must be addressed, including the inability to use purchase incentives such as HVIP for state mandated vehicle purchases. It has been argued that a vehicle purchase mandate can assure vehicle adoption, but trying to force the procurement of these vehicles without funding to help fleets overcome the sizeable increase in their business costs will lead to clean diesel vehicle pre-buys and longer vehicle retention cycles, thereby undermining the emission reduction benefits the regulation is intended to promote.

Based on our Volvo LIGHTS project and our ongoing ZEV product development efforts, our biggest concerns about the ACT are not related to technology viability, but rather to other conditions beyond our control that are critical to ensure a favorable market environment. The Volvo Group is making significant investments to meet California’s ZEV vehicle demands and believes it can meet the rule’s percentages as currently proposed (with some minor technical modifications as outlined below), but ONLY IF:

* A formal structure and process are created wherein CARB, CEC, CPUC and other relevant agencies are accountable to coordinate and plan charging infrastructure
* Robust funding for heavy-duty ZEV purchase incentives under the HVIP program are maintained for several years even if purchases are mandated
* A provision is included to exempt manufacturers from these mandated levels if the first two points are not realized.
* The final regulation is meaningfully informed by technology and market implications of other CARB rules including the low NOx regulation, truck OBD, ZE Drayage regulation and changes in truck warranty and useful life provisions.
* Closer collaboration between CARB staff and industry is undertaken to address the concerns raised in this document and those outlined in comments submitted by the Truck and Engine Manufacturers Association.

**Specific Proposal Comments**

The Volvo Group is a member of the Truck and Engine Manufacturers Association and supports the comments it is submitting; however, the following issues are ones we wanted to add or expand upon as part of our submission.

A sales mandate is no longer warranted

One of CARB staff’s early stated reasons for a HD ZEV sales mandate was to force traditional heavy-duty vehicle manufacturers into the ZEV market. It has been reasoned that more options from well-established manufacturers would help to accelerate the HD ZEV market by leveraging the reputations, service networks and manufacturing scale of large OEMs. Additionally, it would support the Ports of Los Angeles’ and Long Beach’s Clear Air Action Plan and the implementation of AB 739 requiring ZEV purchase by state government fleets. The Volvo Group believes this reasoning is now dated.

At the time of the first discussions around the ACT regulation sales mandate in 2016 there were few, if any, announced plans by large HD OEMs to expand into ZEV production. However, since then all major HD OEMs have announced planned ZEV commercialization beginning as early as 2020 across several applications. These early HD ZEVs will be controlled to validate their suitability to customers’ operations and as manufacturers gain knowledge and the technology evolves, the number of vehicle applications will increase.

Once these early successes are proven in the marketplace and the barriers to entry are minimized, vehicle penetration will grow organically, with no need for a sales mandate. Instead, a sales mandate could cause manufacturers to deploy the technology into applications and customer operations for which it is not well suited, thus having the effect of impeding market acceptance.

Choosing winners and losers

As currently proposed, the regulation will reward those OEMs with larger market share in vehicle classes and applications well suited to electrification and penalize manufacturers who have limited or no penetration in those segments. For example, the majority of California sales for the Volvo Group are class 8 long-haul sleeper tractors. In the short-to-mid-term, battery technology is not mature enough for a 500 – 600 mile range which, with the lack of public charging infrastructure, disadvantages the Volvo Group due to a lack of suitability in applications where it has a majority of its sales. In terms of vocational vehicles, true class 7 vocational vehicles[[1]](#footnote-1) (otherwise known as “straight trucks”, or “trucks”) account for less than 1% of total vehicle production, with the vast majority of the Volvo Group’s vocational vehicle production consisting of class 8 vehicles developed and validated for severe-duty heavy construction applications which we also do not believe are ready for electrification. As such, the Volvo Group could be forced to electrify 100% of its refuse applications in California and still fall short of the required penetrations over the life of the requirement, subsequently necessitating credit purchases from competitors (that may, or may not be available) at likely exorbitant rates. Our competitors that hold substantial shares of the medium heavy-duty market, however, could choose to electrify vehicles in classes 4-7 that are better suited to electrification given current fleet interest and technology (e.g., delivery step-vans, or class 4-6 box trucks); thereby allowing them to delay electrification of more challenging class 8 applications.

For this reason Volvo Group requests that the penetration rates of class 8 vocational vehicles be the same as class 7 and 8 tractors and that credits from lower classes be restricted, capped, or otherwise limited (beyond weight class modifiers) in their ability to meet deficits in the class 8 vocational and class 7-8 tractor category.

Allow movement of class 8 truck credits into tractor category

The ACT proposal currently strands the class 7-8 tractor category by prohibiting the use of credits from other categories to meet tractor deficits. The rationale is “to ensure the development and deployment of zero-emission technologies in tractors which represent one of the largest on-road emissions categories and to support broader CARB strategies to reduce emissions in disadvantaged communities and areas with high concentrations of truck traffic such as ports, railyards, and warehouses.” (ISOR, Pg. IV-18) Further, ISOR Pg. III-9 states that “to ensure ZEV tractors will be available to reduce emissions at ports and other areas with high tractor concentrations, only class 7 and 8 tractor credits may be used to satisfy class 7 and 8 tractor ZEV deficits”.

As of October 2019 all major manufacturers of HD tractors have announced commercialization plans for ZEV tractors within the class 7 and 8 weight classes with at least three manufacturers targeting sales in 2020. Given the many ongoing pilot projects and the announced commercialization by major OEMs before the 2024 implementation date of the ACT regulation, the Volvo Group does not believe the restriction on credit movement into the tractor category is warranted.

During discussions with CARB staff the Volvo Group requested that there be no restriction on credit movement into the class 7-8 tractor category in order to reduce the risk of non-compliance. CARB staff dismissed any concerns, in part with the argument that the San Pedro Bay Ports’ (the Ports) Clean Air Action Plan calls for more zero-emission tractors than the ACT requires. While this might be true in terms of aggregate numbers in the long term, it cannot be relied on to guarantee a market for BEV tractors for many years due to SB1 and the relatively long time horizon of the full ZEV requirement (2035).

Barring full fungibility, the Volvo Group suggested a potential percentage cap on the number of class 8 truck credits that could be used to offset a class 7-8 tractor deficit (i.e. a manufacturer could use class 8 truck credits to offset up to 50% of an annual tractor deficit). The cap approach, even if at a high level (e.g. 90%), would still meet staff’s stated goals of making ZEV tractors available, while also reducing risk to manufacturers based on their product portfolios and market segment shares. In response, staff suggested a discount be applied for any credits moved into the class 7-8 tractor category; however, given the high expected penetrations of class 8 straight trucks, this would still disadvantage some manufacturers over others based on their product mix.

Lastly, a class 8 straight truck will operate under a nearly identical duty cycle as a class 8 tractor in an urban pickup and delivery application. In terms of a CO2 ton-mile basis the ZEV class 8 straight truck would have a greater emissions reduction than a ZEV Class 8 tractor when compared against their diesel equivalents.

Due to all of the above, the Volvo Group again requests that class 8 truck credits be allowed free movement into the class 7-8 tractor category.

Sincerely,

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1. Though both Volvo and Mack Trucks produce Class 7 tractors, these are Class 7 only by virtue of their 4x2 axle configurations and Gross Vehicle Weight Ratings (GVWR). These Class 7 tractors utilize the same Heavy Heavy-Duty engines, and are rated to the same Gross Combination Weight Ratings, as a 6x4 tractor. [↑](#footnote-ref-1)