TOYOTA

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Sustainability and Regulatory Affairs
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Clerk of the Board
California Air Resources Board
1001 I Street
Sacramento, CA 95812

May 31, 2022

RE: Toyota Comment on the Advanced Clean Car 2 (ACC2) Staff Report

Toyota is pleased to submit these comments to the staff's proposed amendments to the ZEV regulations in the ACC2 staff report. In addition to these comments, we support and incorporate by reference the ZEV and LEV comments of the Alliance for Automotive Innovation submitted May 31, 2022.

A Portfolio Approach

For over two decades, Toyota has been at the forefront of efforts to electrify the transportation sector, starting in 1997 with the introduction of the Prius, the world's first mass production hybrid electric vehicle. Now in 2022, we have 18 hybrid models in the US market making up nearly 25% of Toyota's US sales . In addition to our efforts with hybridization, Toyota has embraced a portfolio approach to ZEVs . Battery Electric Vehicles (BEVs), Plug-in Hybrid Electric Vehicles (PHEVs) and Fuel Cell Electric Vehicles (FCEVs) all have an important role to play in decarbonizing light duty transportation, and we are committed to accelerating market acceptance for all these advanced powertrains. In particular, we see a role for BEVs and PHEVs as primary vehicles where home charging is convenient, PHEVs as primary vehicles for those who tow or as second vehicles when public charging is not sufficient, and FCEVs where home charging is not convenient and long-distance driving and/or fast refueling is needed. Toyota is one of a few automakers that currently have product in each of these segments, including the Mirai FCEV, bZ4X BEV, Prius Prime/ RAV4 Prime/NX PHEVs with more to come. As announced by our company President in December 2021, we will invest approximately $70 billion in electrified technology globally through 2030, with half of that targeting BEVs. Toyota will release more products with advanced powertrains as the market develops, on our path towards carbon neutrality.

ZEV Stringency

The ACC2 regulation is aligned with Governor Newsom's Executive Order N-79-20, which set the ambitious goal of 100% ZEV sales by 2035. And while consumer interest in ZEV technologies is growing, we are concerned about the 2026MY starting requirement of 35% and the pace of increase year-over-year thereafter. Recent data from the California Energy Commission's ZEV dashboard shows ZEV sales in Q1 2022 reaching 16% of total California light vehicle sales, and further review of the data show 65% of sales are from one single luxury brand with average transaction price above $65,000 (source: Kelley Blue Book, March. 2022).

The ACC2 requirement would force the ZEV market to move to the mainstream quickly. This means we need ZEV product in the Camry/RAV4 price range, around low to mid $30,000. Other challenges include procurement and cost of raw materials for electrical components, the ability to ramp up battery production, and the development of an ecosystem to manage end-of-life batteries from all these ZEVs. Lastly, electric charging and hydrogen refueling infrastructure needs to advance to support these ambitious goals. In conclusion, while purchase cost is an important factor for mainstream customers there are multiple, complex factors at play that are outside Toyota's or California's ability to control that make ACC2 an extraordinary challenge to meet.

As difficult a challenge it is to comply with this proposed regulation in California, it is more difficult in S177 states. Headwinds such as the lower current sales rate (approx. 1/3 of California), lack of important complimentary policies and incentives such as LCFS, CVRP, and less developed or non-existent electric charging and hydrogen infrastructure make following California sales growth trends that much more difficult.

FCEV

An important advantage of FCEVs is that they provide over 400 miles of range on less than 5 minutes of fueling. Despite progress in EV charging times, rapid refueling remains one of FCEV's primary value proposition, and makes FCEVs closest to the experience of over 90% of Californians who still drive gasoline powered vehicles. In addition, for most Californians and Americans who live in multi-unit dwellings or do not have access to convenient charging at home or work, FCEVs will fill a necessary and significant market segment since they are fuel in a manner similar to that of conventional vehicles, e.g., at local filling stations each capable of servicing hundreds or thousands of FCEVs. For these reasons, Toyota agrees with CARB staff's scenario presented at the October 13, 2021 ZEV Workshop that at least 17% of ZEVs in California will be FCEVs by 2035. But the market for FCEVs is still at an early stage, and unlike BEVs or PHEVs, which are primarily charged at home, FCEVs must have reliable and abundant hydrogen fueling stations to succeed. Our experience has consistently shown that fueling infrastructure must be in place before vehicles are introduced.

Along with other fuel cell manufacturers, Toyota submitted a letter on March 14, 2022, to Chair Randolph and Executive Officer Corey raising a significant concern about the proposed discontinuation of the so-called "travel provision" in the ZEV regulation. This provision provides a critical incentive for automakers, like us, who agree with CARB that FCEVs are essential for meeting California's climate and air quality goals. The so-called "travel provision" allows automakers to receive credits for FCEVs placed in California to count toward compliance in other states that do not yet have the hydrogen infrastructure in place that is necessary before FCEVs can be sold in those states.

In addition, we have been working directly with several of the states who have adopted the ZEV Program to remove barriers to fuel cell sales (such as the continued prohibition of FCEVs in certain tunnels and bridges in the Northeast) and to lay the groundwork for light duty hydrogen infrastructure in those and other states. Although we expect continued progress in these efforts, the fact remains that the vast majority of these states have not yet made the investments and policy changes necessary to prepare for the hydrogen fuel cell market. FCEVs are an integral technology pathway in the ZEV regulation, but one we are challenged to sell given this situation.

Therefore, we urge CARB to maintain the travel provision, but with the following limitations to address S177 state concerns :

- Sunset travel after 2030,
- Cap travel credit usage to 10% of an OEM requirement in a S177 state, and
- Phase-out travel as infrastructure in S177 states catches up to the California baseline of hydrogen readiness.

We believe this proposal will have a limited impact on mandated ZEV volumes. For example, using AB 8 projections as a proxy, we estimate that extending the Travel Provision would result in less than a 1.5% impact in 2026MY on total ZEV requirements in the S177states. Considering the current CARB staff proposal calls for an 8% per annum increase, we believe our proposal would have a marginal impact in the S177 states, but an outsized impact in helping continue to grow the FCEV market in California and continuing the development of the technology that will be essential to expansion of FCEV across the United States.

PHEV

Like BEVs, we believe that convenient home or work charging is essential for PHEVs. PHEVs will be particularly important in early years as public infrastructure expands, for customers who are concerned about taking the leap to full electric or as a second or third electric vehicle in a household, as well as certain use cases such as heavy towing. For these reasons, we continue to expect consumer adoption of PHEVs to increase.

We support staff's proposal for minimum performance requirements for PHEVs for both range and power. However, we urge the Board to consider extending the interim 30-mile range provision two extra years (through to 2030MY) for Class 2a (6,000-8,500lb GVWR) Light-Duty Trucks. Class 2a trucks are larger vehicles requiring bigger batteries and electrical systems, and generally also have longer life cycles. This additional two years of flexibility will allow Toyota and other manufacturers to reach an important, and perhaps harder to reach, market segment with compelling product that still provides the towing and cargo capacity that these drivers demand.

Incentives

To make further inroads with mainstream consumers, there needs to be certainty with regard to vehicle affordability. For the immediate future, ZEVs have a cost premium over conventional vehicles. For example, the price difference between our RAV4 hybrid model and the RAV4 Prime PHEV is approximately at least $7,000 and the new bZ4X BEV about $5,000 more. These costs differences may reduce in time as technology improves but will remain intimidating for the foreseeable future to many value-based shoppers who represent a significant base of mainstream consumers. Mainstream consumers continue to require incentives to help them bridge the price gap and make a purchasing decision.

Toyota appreciates California's investment into providing consumer-facing incentives such as the Clean Vehicle Rebate Program (CVRP) and Clean Fuel Rewards (CFR) and believes that these incentives must continue and be continuously well funded. However, the CFR incentive amount was reduced by 50%, and CARB had considered phasing-out CVRP and only offer it for low-income buyers. Toyota believes it would be a mistake to eliminate eligibility of CVRP for middle-income buyers since middle-income buyers are those who can populate and expand ZEV markets with the scale required to meet the ambitious targets and timelines set by ACC2.

Infrastructure

Reliable and convenient infrastructure is essential for success of the ZEV market. In the case of BEVs and PHEVs, this means being able to charge where one normally parks their car without having to return just to move it from the charging spot. For BEVs, it also means having sufficient

and reliable public infrastructure to allow confidence in going longer distances without being stranded or waiting excessively. For FCEVs, this means a robust and growing hydrogen fueling network, one that is tailored for light-duty vehicles and convenient to where customers are accustomed to filling their conventional vehicles. Confidence in infrastructure is a make-or-break issue for capturing the hearts and minds of mainstream consumers towards ZEV.

S177 States Pooling

While proposed as a helpful flexibility, the pooling provision, will have little impact on compliance and product flexibility. The pooling provision requires OEMs to over comply in one state to have the option of using overcompliance credit for assisting another state. For traditional OEMs, achieving compliance even in one state will be challenging and thus the value of pooling could be limited to luxury EV OEMs.

Environmental Justice

Toyota shares CARB's vision for transportation electrification that can reach the broadest economic spectrum of California drivers. This philosophy underscores our portfolio approach to electrification and is what drives our continued efforts to expand not just our ZEV and PHEV offerings, but our ever-expanding low emission hybrid product lines.

But we also recognize that we must do more to increase access and ownership opportunities for lower income Californians, and particularly those who live in some of the state's most impacted communities. With this in mind, innovative pilots such as our collaboration with Valley Clean Air Now (Valley CAN) will be important in developing effective programs to address these needs. The Valley CAN project establish a first-of-its-kind pilot program to provide certified pre-owned Mirai FCEV at no cost to 27 San Joaquin Valley residents to replace their older gasoline-powered cars. The program, offering a way to provide access to zero-emission vehicles to more people to quantifiably reduce air emissions in the San Joaquin Valley, also provides participants with $15,000 prepaid fuel cards intended to cover the cost of three years' worth of hydrogen fuel. The program will also produce a study that will provide much-needed data on the benefits that fuel cell electric vehicles can provide to residents of underserved communities – especially long-range commuters and farmworkers – that can help inform equitable zero-emission vehicle policy as well as future efforts to deploy FCEVs in local communities.

The Need for Periodic ZEV Program Review

Toyota supports the goals of electrification and the transformation of the light duty vehicle fleet, but we have significant concerns with the pace and volume requirements of the staff's proposal. The ZEV and PHEV markets have been moving quickly and continue to evolve. Despite cost and market breakthroughs, industry sales in 2021 were only 13% (albeit increasing to 16% in Q1 2022) and about 5% in S177 states. We have a long way to go to reach the ambitious targets CARB expects in ACC2, and the fundamental question remains how quickly the vast majority of California and S177 state drivers will embrace these technologies and products.

For these reasons, we urge the Board to consider a formal and periodic review of the ZEV program, including both technology and market considerations. This will allow CARB to continue to adjust and allow for new considerations as the market, consumer demand, and innovation evolves. We believe this review should occur biannually, and that CARB should engage both market and technology experts to provide independent analysis.

If you have any questions or comments, please contact Michael Lord at (310)787-5644 or michael.lord@toyota.com.

Sincerely,

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