GENERAL MOTORS

Barbara E. Kiss, Director
Environment & Energy

Global Public Policy
MC: 482-C30-B36
300 Renaissance Center
Detroit, MI 48265-3000

SM 3202

May 28, 2020

Honorable Chairman Mary D. Nichols and Honorable Board Members
California Air Resources Board
1001 I Street
Sacramento, CA 95812

Re: Proposed Amendments to the Proposed Advanced Clean Trucks Regulation

Dear Chair Nichols and Honorable Board Members:

General Motors LLC (GM) appreciates the opportunity to offer comments on the Proposed Amendments to the Proposed Advanced Clean Trucks Regulation. We are working toward an all-electric future and are doing our part by investing in manufacturing, innovation and infrastructure. We also remain deeply engaged in policy and stakeholder discussions involving electrification goals, policies, incentives, and market barriers. To that end, GM resubmits our attached comments dated December 2019 to help contribute to the development of California's electrification policies.

Electrifying the medium- and heavy-duty (HD) vehicle sectors requires a strategic approach with a suite of policies and programs to overcome transition barriers in each market segment. Given the diversity of vehicles and operational needs, it is widely accepted that some market segments are relatively ready for electrification while others remain far more challenging in the near term. As noted in CARB's ISOR and original staff proposal, HD pickup trucks are ill-suited to near-term electrification. The regulation as originally proposed did not include pickup trucks until the 2027 model year in recognition of the unique electrification challenges for this vehicle segment. However, the proposed amendments shorten this lead-time by three years while also increasing sales requirements.

In our December 2019 comments, GM raised several key policy considerations such as total cost of ownership, and gaps in complementary policies for HD pickups. GM does not believe that our comments have been addressed within the proposed amendments and accompanying documents. Indeed, the proposed amendments exacerbate these challenges for HD pickup trucks by accelerating and strengthening the intended near-term sales requirements for HD pickups without addressing

identified deficiencies in the proposed policy approach. Therefore, GM respectfully resubmits our December 12, 2019 comment letter as an attachment for the record and for the board's additional consideration.

GM appreciates the opportunity to provide additional input to California's policies, and we look forward to continuing to work with you and your staff to help move toward GM's vision of an all-electric future.

Sincerely,

Barbara Kiss, Director
Environment & Energy

Attachment

GENERAL MOTORS

Barbara E. Kiss, Director
Environment & Energy

Global Public Policy
MC: 482-C30-B36
300 Renaissance Center
Detroit, MI 48265-3000

SM 3199

December 12, 2019

Honorable Chairman Mary D. Nichols and Honorable Board Members
California Air Resources Board
1001 I Street
Sacramento, CA 95812

Re: Item 19-12-4 Advanced Clean Truck Regulation

Dear Chair Nichols and Honorable Board Members:

General Motors LLC (GM) appreciates the opportunity to offer comments on California's Advanced Clean Trucks (ACT) rulemaking. GM has contributed to and supports the written comments of the Truck and Engine Manufacturers Association (EMA) and CalETC. These comments are intended to provide GM's perspective on electrification, complementary policies, and specific considerations regarding medium- and heavy-duty (HD) pickup trucks.

GM has a vision for a future with zero crashes, zero emissions, and zero congestion. We at GM believe that climate change is real, and we take the challenges it presents seriously. We recognize that the transportation sector needs to be a part of the solution, which is why we believe in an all-electric future. To support that future, we are doing our part by investing in manufacturing, innovation and infrastructure. This includes a joint venture with LG Chem to mass produce battery cells for future battery electric vehicles in Ohio.

We cannot meet our vision alone, GM is actively engaged in policy and stakeholder discussions involving electrification goals, policies, incentives, and market barriers. For example, we continue to advocate in the Legislature for increased vehicle incentive funding, we are active in discussions around the Low Carbon Fuel Standard, and we participate in proceedings at the California Public Utilities Commission and the California Energy Commission on EV infrastructure, electricity rates, and vehicle-grid integration. To successfully accelerate transportation electrification requires careful coordination of all these policies, and some market segments (so-called "beachheads") will move faster than others.

Incorporation of HD pickup trucks in the ACT should not occur any earlier than proposed by CARB Staff.
The ISOR recognizes that HD pickups and their predominant use cases are currently ill-suited to near term electrification, and the proposed regulation therefore provides until the 2027 model year for the market, technology, and complementary policies to develop. GM believes that proposing additional time for the market and supporting policies to develop was a prudent decision by CARB staff that was

based on consideration of the relevant market barriers and opportunities. Arguably, the proposed MY 2027 start date is insufficient given the unique challenges of this market, and we encourage the Board to consider a start date such as the 2030 model year or a slower phase-in given operational challenges, total cost of ownership, and a relative lack of policies to support demand in the HD pickup market.

Operational Challenges: CARB analysis shows barriers to near-term electrification of HD pickups
In order to supplement discussion about HD markets with the best "fit" for electrification based on duty cycle and charging considerations, EMA developed a Market Segmentation Analysis in late 2018.[1] CARB staff then updated this analysis in early 2019 using different assumptions and scoring.[2] CARB's own analysis shows that 99% of California pickups by end use and annual sales volume are not well-suited to near-term electrification.[3] As shown in CARB analysis, the relatively poor scores for pickups are due to a combination of factors including range, route variability, infrastructure, and battery space constraints. CARB staff states in the ISOR that "ZEVs may not be suitable for periodic towing of heavy loads which could be a problem for a vehicle with limited range capability. Routes and range needs are less predictable for pickup trucks…"[4]

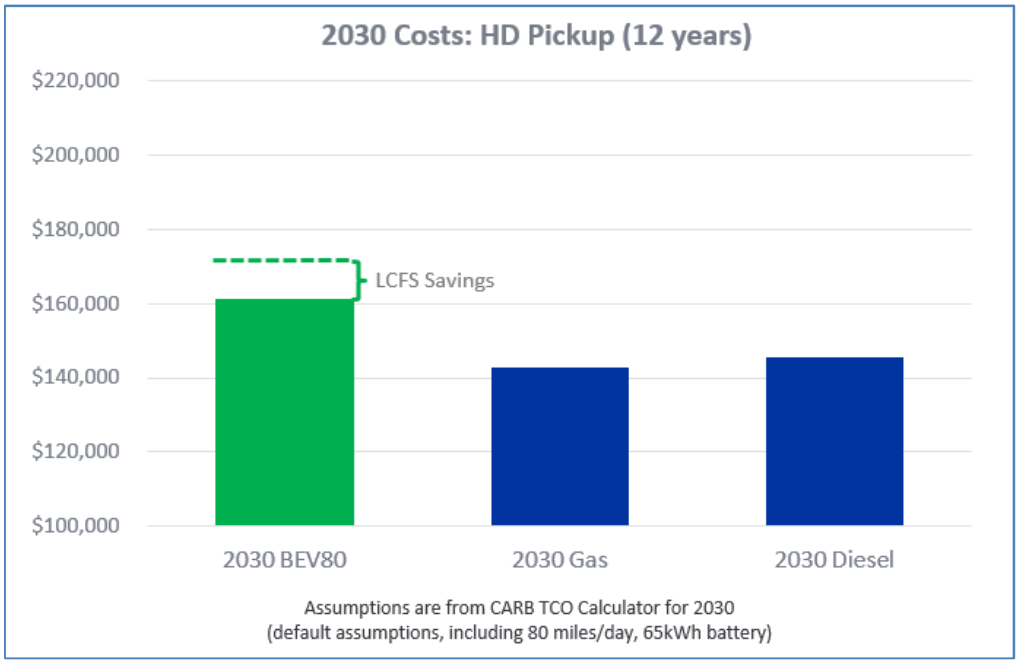
There has been some confusion in workshops and stakeholder meetings about the distinction between fully capable HD pickups used as "work trucks" and their light-duty (LD) counterparts. Proprietary data show that HD pickup truck consumers are two to three times as likely to use their vehicles for trailering duties vs. their light-duty counterparts. Proprietary data also shows that trailering is the number one purchase consideration of perspective HD pickup truck consumers.[5] It is important for policymakers to continue to distinguish the very different abilities, requirements, and use cases of LD (class 2a) pickup trucks vs. HD (class 2b/3) pickup trucks, and to avoid conflating the near-term promise of greater LD electrification with the ill-suited nature of most HD pickup trucks.

According to the ISOR, the "primary purpose of the Proposed ACT Regulation is to accelerate the market for zero-emission medium- and heavy-duty on-road vehicles in applications that are well suited for their use." As noted by the staff, this includes fleets that "operate in urban centers, have stop and go driving cycles, and are centrally maintained and fueled."[6] HD pickup trucks essentially operate outside of the scope of what the ACT policy intends to target.

Total Cost of Ownership: CARB analysis indicates higher lifetime costs for electrified HD pickup trucks.
CARB staff developed a total cost of ownership (TCO) model to compare lifetime cost for zero emission vs. conventional trucks.[7] The ISOR attempts to highlight lifetime cost savings for select electrified product segments. However, CARB staff's TCO model suggests that electrified class HD pickup trucks

[1] https://ww2.arb.ca.gov/sites/default/files/2018-11/181204emaanalysis_0.xlsx
[2] https://ww2.arb.ca.gov/sites/default/files/2019-02/190225actmarketanalysis.xlsx
[3] CARB's staff analysis segments the truck market by end use, with a total of 53000 annual California sales across six different pickup truck market segments. Each market segment is then rated on electrification "suitability" with a numerical score, with scores of "1" or "2" being most "ready" for electrification. CARB's analysis shows that 99% of pickup trucks by volume score 3.75 or worse, with zero pickup truck segments receiving a score better than "3."
[4] ISOR, page I-9 https://ww3.arb.ca.gov/regact/2019/act2019/isor.pdf
[5] GM analysis of PROPRIETARY national & state vehicle registration data (MaritzCX NVCS)
[6] ISOR, page I-1 https://ww3.arb.ca.gov/regact/2019/act2019/isor.pdf
[7] https://ww2.arb.ca.gov/sites/default/files/2019-05/190508tcocalc_2.xlsx

have higher cost than their conventional counterparts throughout the entire period of the ACT policy (2030), even when considering Low Carbon Fuel Standard (LCFS) "savings," as shown below.



The lack of a positive total cost of ownership for prospective HD pickup truck consumers even in 2030 is particularly striking given the assumptions that favor electrification throughout the analysis. Specifically, the following TCO assumptions (among others) by CARB staff are unrealistic for HD pickup trucks, suggesting that the actual lifetime costs for a fully electric pickup is even less favorable.

i. Range and battery capacity: CARB assumed very small battery capacity and range. For example, the default assumption used for battery electric HD pickup trucks was 65kWh battery pack which happens to be the approximate size of the battery used in the Chevrolet Bolt EV, a light duty vehicle with no need for towing or heavy loads. This unrealistically small battery capacity requirement is based on a range requirement of only 80 miles/day. GM believes the minimum acceptable range to the 2b/3 pickup segment is significantly higher and battery capacity would need to increase accordingly. Increasing battery size and range to meet capability requirements would dramatically increase cost.

ii. Low Carbon Fuel Standard: In the TCO model, the TCO discussion document, and the ISOR, CARB staff assumes that LCFS credit values are captured by end users, thereby reducing operating costs. Lifetime operational cost savings for HD pickups are estimated at approximately $12,000 in 2030 (shown in the figure above). While large fleets that own their own central charging depots may be able to leverage the LCFS program to reduce costs, LCFS savings cannot be assumed for HD pickup owners given the fact that most pickups are sold into retail or small fleets. For customers that charge at home, the LCFS credits generated by EV charging are captured by utilities and not the HD pickup owner. Furthermore, small fleets may lack the scale and resources needed to cost-effectively capture and monetize LCFS credits.

iii. Vehicle lifetime: CARB's TCO model looks at costs over a 12-year period. That timeframe greatly overstates the time period over which typical retail consumers might consider in their purchase decisions. The incremental costs of electric HD pickup trucks compared with their conventional counterparts are even greater when potential buyers are considering a shorter ownership period.

Concerns about the TCO assumptions notwithstanding, CARB's own analysis more than justifies the proposed start date for the HD pickup truck EV program. Given the fact that the HD electric trucks remain more expensive on a TCO basis throughout the life of the rule (2030 model year), we respectfully suggest a later start date may be prudent, and that consideration of additional modifications may be necessary to ensure successful electrification of the HD pickup market once the technology and market conditions are right.

Complementary Policies: HD pickups have unique challenges about infrastructure, incentives, and fleet rules.

As noted previously, successful electrification of the HD sector requires a holistic approach addressing not just vehicle availability, but also infrastructure, costs, and potential fleet requirements. California has been a clear leader in implementing a suite of policies to support electrification. These include:

- Purchase incentives: The Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) provides significant funding for heavy duty commercial EVs, through funding is uncertain.
- Fueling incentives: The LCFS can help with fueling costs for some fleets.
- Infrastructure programs: Utility investments in HD EV infrastructure are frequently cited as a potential solution for infrastructure deployment.
- Fleet purchase rules: Staff has indicated that CARB will be developing fleet purchase rules to bolster demand for HD EVs.

Though each of the programs above has its own uncertainties and implementation challenges, all are important tools for enabling heavy duty electrification. Unfortunately, these programs are generally not designed with HD pickups in mind. HVIP incentives are not available to retail customers, who make up the bulk of HD pickup sales. The LCFS program, as noted above, is not structured to benefit retail or small fleet customers. The utility infrastructure programs are also designed for larger fleets, and are limited in size, duration, and geography. Finally, HD pickups are sold primarily (more than 70%) as individual retail or small fleet sales in California.[8] As such, CARB staff cannot generally support the sale of these vehicles with a supporting fleet purchase rule.

Conclusion: The proposed MY 2027 start date for HD EV pickup trucks is ambitious and potentially over-optimistic.

Over the past several years of regulatory development, CARB staff has stated that the ACT rule is intended to focus on those applications best suited for electrification. This includes vehicles with short, predictable routes and centralized fueling. Likewise, the forthcoming fleet purchase requirements are intended to focus on larger fleets with applications well-suited for electrification. However, the ACT policy as proposed would fall unevenly in volume on HD pickup trucks due to the disproportionate number of these vehicles within the combined class of heavy-duty vehicles targeted by the ACT policy (≤8,500 lbs. GVWR). For example, national registration data obtained by GM for the 2018 calendar year suggests that approximately 65% of the vehicles targeted by the ACT would be made up of class 2b/3 pickup trucks alone.[9]

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[8] GM analysis of PROPRIETARY national & state vehicle registration data (RL Polk Total 2018CY Registrations and J.D. Power PIN ATP data Aug 2019 CYTD
RL Polk Retail, Fleet and "Non-Fleet Commercial – All" Registrations

[9] GM analysis of PROPRIETARY national & state vehicle registration data (IHS Markit Data)

Given the disconnect between the stated focus of the ACT rule and the realities of the HD pickup market, as discussed in ACT supporting analyses, providing additional time for the market to develop before implementing requirements for this market segment is prudent. GM respectfully suggests that CARB consider further adjustments given staff's own analysis of the HD electric pickup market.

Sincerely,

Barbara Kiss, Director
Environment & Energy