February 19, 2019

California Air Resources Board
1001 I St.
Sacramento, CA 95814

*Submitted via online portal*

Re: Joint Party Feedback on Proposed Alternative Certification Requirements and Test Procedures for Heavy-Duty Electric and Fuel-Cell Vehicles and Proposed Standards and Test Procedures for Zero-Emission Powertrains Rulemaking

The Joint Parties, listed as signatories at the end of this letter, appreciate the opportunity to provide feedback to the California Air Resources Board (CARB) on the Proposed Alternative Certification Requirements and Test Procedures for Heavy-Duty Electric and Fuel-Cell Vehicles and Proposed Standards and Test Procedures for Zero-Emission Powertrains (ZEP Cert.) Rulemaking. Staff have made many efforts to understand and incorporate our feedback over the course of regulatory development, for which we are thankful, and this letter outlines priority areas where we believe improvements still need to occur before this regulation is adopted.

The Joint Parties are supportive of CARB's many efforts to advance and accelerate zero-emission medium- and heavy-duty transportation technologies. CARB's regulatory and funding programs are important tools to reduce emissions from medium- and heavy-duty transportation. According to CARB's analyses, continued and increased deployment of medium- and heavy-duty zero-emission vehicles (ZEVs) is necessary to reach California's air quality, climate, public health, and economic objectives. However, transitioning the medium- and heavy-duty sectors to zero-emission technologies is and will continue to be a difficult task, requiring appropriate incentives and other policies.

Consumer confidence plays a critical role in purchasing decisions for medium- and heavy-duty vehicles and the intent of the proposed regulations is to help mitigate this issue. However, we have some concerns with how the proposed regulations may affect the zero-emission medium- and heavy-duty market, as well as recommendations for adjusting the regulation to address these concerns.[1]

Below, please find our feedback on the proposed ZEP Cert. regulatory package. While not all signatories to this letter are equally affected by each of the issues addressed below, this input is representative of a broad and diverse cross section of industry.

[1] Many of our members contest CARB's statutory authority to impose Heavy-Duty Zero-Emission Powertrain regulations, of the type proposed here, at all. Without conceding that argument, those members choose to sign on to these comments so that in the event CARB is found to have authority to promulgate such regulations, those members can express their concerns with CARB's presently-proposed implementation of those regulations here.

## I. We estimate that the costs of the proposal are higher than anticipated in the Initial Statement of Reasons.

The proposed regulations would require many significant changes to current engineering, manufacturing, warranty, recall, documentation, and reporting practices. These changes in current practice will require considerable staff time and resources for manufacturers, which in turn will add increased costs for fleets. Additionally, the regulations will likely result in longer product-release timelines and more expensive ZEVs, when these technologies are already more expensive than similar internal-combustion-engine (ICE) vehicles.

The Initial Statement of Reasons (ISOR) estimates that the potential benefits of the ZEP Cert. regulation outweigh the costs, and the total cost of the regulations from 2021 through 2025 is projected to be $431,800 over 600 vehicles.[2] The ISOR projects that in 2021, the first year of certification, the total vehicle model year costs would be $166,560, with significantly declining costs per model year after 2021.[3] In coordination with medium- and heavy-duty vehicle manufacturers, we estimate that the potential cost of these regulations for the first model year built to the specifications of the certification proposal, including one powertrain and one vehicle certification family, would be between $500,000 and $5,000,000, with costs declining over time. The Joint Parties are concerned about this level of added cost from the proposed regulations because, depending on the number of vehicles certified annually, the certification-compliance costs allocated to each vehicle could exceed the cost of the certified vehicle. This estimate does not include uncertain and potentially large costs associated with the currently-proposed recall requirements.

## II. The currently-proposed mandatory warranty-reporting and recall requirements are problematic, and we support staff's efforts in draft 15-day changes to address our concerns.

Unlike an ICE vehicle, a ZEV produces no tailpipe emissions, and this does not change over the course of a ZEV's useful life. For ICE vehicles, the parts that trigger a CARB recall are those tied to emissions—the engine and its certified components (like aftertreatment devices)—which ensures the vehicle stays in compliance with emissions requirements throughout its life. And, all vehicles are subject to safety-related recalls, including ZEVs. We agree that recalls are appropriate for situations where there is a public health, i.e., safety- or emissions-related, consequence from a component's failure or usage. However, we do not find a traditional recall program for ZEV-components to be in the public interest, like emissions or safety recalls.

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[2] Initial Statement of Reasons for the Proposed Alternative Certification Requirements and Test Procedures for Heavy-Duty Electric and Fuel-Cell Vehicles and Proposed Standards and Test Procedures for Zero-Emission Powertrains, CARB, December 31, 2018, p. 37 [$720 per vehicle as a sales-weighted average for 600 vehicles from 2021 to 2025].

[3] Initial Statement of Reasons for the Proposed Alternative Certification Requirements and Test Procedures for Heavy-Duty Electric and Fuel-Cell Vehicles and Proposed Standards and Test Procedures for Zero-Emission Powertrains, CARB, December 31, 2018, pp. 36-37, Table 7.

The proposed mandatory recall-triggering requirements for zero-emission powertrain components are stringent, e.g., as compared to the recall requirements for heavy-duty internal-combustion-engine components that cause a violation of emissions standards.[4] The Joint Parties find the current draft regulatory language problematic, as the failure of a zero-emission-powertrain component will not result in the violation of emissions standards. It is our understanding that CARB staff intend to propose amendments to many portions of the current recall provisions, and we support these amendments. We recognize, however, that even with these anticipated amendments, recall requirements on ZEVs will still add significant costs to the upfront purchase price of a certified ZEV. As a result, we continue to feel that recall provisions are inappropriate to include in this ZEV certification proposal.

CARB staff shared that they intend to update the regulations so that mandatory recalls will only be triggered for component failures that render the vehicle inoperable. We agree that the current regulatory language does not limit the mandatory recall provisions to only situations where a component failure renders the vehicle inoperable;[5] and we support staff clarifying this in the regulation. CARB staff also shared that they intend to amend the recall provisions to, among other things: remove the influenced recall provisions and clarify and update several warranty- and recall-reporting requirements. We support these planned amendments to the proposed recall regulatory language.

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[4] Proposed Alternative Certification Requirements and Test Procedures for Heavy-Duty Electric and Fuel-Cell Vehicles and Proposed Standards and Test Procedures for Zero-Emission Powertrains, CARB, Appendix D, Part II: Heavy-Duty Zero-Emission Powertrain Warranty and Recall Requirements, sections L-AB [section X states "A zero-emission powertrain in a certification family is subject to recall at the following failure levels: **4 percent or 25 (whichever is greater)** for 2021 and subsequent model-year zero-emission powertrains."]. Compare to current heavy-duty engine recall requirements for emissions failures of **4 percent or 50 (whichever is greater)**. California Code of Regulations, Title 13, § 2143 ["Vehicles or engines…are subject to recall at the following failure levels: …2 percent or 50 (whichever is greater) for 1994 and subsequent model-year vehicles or engines. The Executive Officer may extend the applicability of the 4 or 3 percent failure levels …"]. See also presentation titled "Emission Warranty Information Reporting (EWIR) Amendments for Manufacturers of Heavy-Duty Engines," presented at January 23, 2019 Heavy-Duty Low NOx Omnibus Program Workshop EWIR Amendments by Emissions Compliance, Automotive Regulations and Science Division, slide 5 [which notes that ARB implements this recall rate at 4 percent or 50 (whichever is greater)], available at https://www.arb.ca.gov/msprog/hdlownox/files/workgroup_20190123/05-EWIR_WS01232019.pdf.

[5] See, e.g., Proposed Alternative Certification Requirements and Test Procedures for Heavy-Duty Electric and Fuel-Cell Vehicles and Proposed Standards and Test Procedures for Zero-Emission Powertrains, CARB, December 31, 2018, Appendix D, Part II: Heavy-Duty Zero-Emission Powertrain Warranty and Recall Requirements, § X ["A zero-emission powertrain family, test group or subgroup shall be subject to a recall when the number of screened failures of a specific *warranted part* exceeds the failure level set forth below…" Emphasis added.]. See also, § A, subd. 3.13 [defining warranted part as "any powertrain component"]. See also, § A, subd. 3.12 [which defines warrantable condition as "a condition of failure of a warranted part that renders the vehicle inoperable and triggers the responsibility of the manufacturer to take corrective action pursuant to subsections B, C, and D of this part"]. We note that term "warranted part" and not "warrantable condition" is used in the warranty and recall provisions in the sections following the definition, except when warrantable condition is used: (1) in section D, where it appears to define a new scenario in which the Executive Officer finds "that a warranted part, or a zero-emission powertrain's nonconformity…is eligible for warranty coverage…" yielding a "Finding of Warrantable Condition." (2) in section AB where warrantable condition is one of multiple criteria that shall be considered in an evaluation by the Executive Officer to determine whether a recall is necessary.

Additionally, as related to the warranty requirements in the proposal, CARB staff indicated that amendments will be made to ensure required warranty coverage will not extend beyond the minimum 3-year or 50,000 miles warranty period[6] into extended warranties that manufacturers voluntarily offer on a given vehicle. We support staff in clarifying the reach of the warranty provisions.

Finally, although it is our recommendation to remove the recall provisions outright, we alternatively believe that if retained, CARB staff should consider renaming the recall program to something more representative of the revised program. The term "recall" has a negative connotation for both manufacturers and vehicle owners given the costs and inconveniences associated with recalls. Furthermore, "recall" has a generally understood meaning in other contexts, complete with capture rates, that does not exactly apply to the notification and voluntary field-action program described by staff. To avoid diminishing the importance of the recall terminology where there is a safety, environmental, or health impact, we therefore suggest that staff remove the "recall" terminology and replace it with field action, ZEV maintenance plan, or something similar.

## III. We support staff's proposed modifications to the current provisions regarding owner's manuals and diagnostic and repair manuals, and continue to recommend that the proposal be modified to include a minimum threshold for when both manuals must be made available, or alternatively, urge CARB to ensure the regulations remain voluntary until 2023.

The current ZEP Cert. proposal would require manufacturers to make available an owner's manual and a diagnostic and repair manual for each powertrain or powertrain family.[7] CARB staff shared with us that they intend to modify the current proposal to clarify that these manuals may be a compilation of multiple information sources. We appreciate the amendments that have been made to this section and this proposed amendment, to add flexibility for manufacturers.

The Joint Parties respectfully request CARB add an appropriate threshold of vehicles, such as 500, under which manufacturers would not be required to provide either manual for a given powertrain. Alternatively, we suggest that CARB ensure the certification regulations remain optional until 2023, e.g., not required by a funding or regulatory program, to allow manufacturers time to implement new procedures, like the manual requirements (this recommendation is further discussed in Section VI).

Creating owner's manuals and diagnostic and repair manuals for a new powertrain is a lengthy and expensive process. Manufacturers often have to recover the cost from a sample vehicle to be used in creation of the manuals and it can take five to ten employees working for a year to create these two

[6] Proposed Alternative Certification Requirements and Test Procedures for Heavy-Duty Electric and Fuel-Cell Vehicles and Proposed Standards and Test Procedures for Zero-Emission Powertrains, CARB, December 31, 2018, Appendix D, Part II: Heavy-Duty Zero-Emission Powertrain Warranty and Recall Requirements, § B, subd. 2.

[7] Proposed Alternative Certification Requirements and Test Procedures for Heavy-Duty Electric and Fuel-Cell Vehicles and Proposed Standards and Test Procedures for Zero-Emission Powertrains, CARB, December 31, 2018, Appendix D, Part I: Heavy-Duty Zero-Emission Powertrain Certification Requirements, §§ C, subds. 4.2 and 4.3; Appendix C, § 1037.115, subd. (B)(3.2-3.3).

manuals. The costs to create these manuals is generally spread across vehicles, which means that when there is a low volume of vehicles, the cost is spread across fewer vehicles and will result in a high additive cost to the upfront purchase price of the vehicle.

In relation to cost, when there is a low volume of powertrains, it is more cost effective to—and fleets may prefer that a manufacturer—send a technician to train operators and repair the vehicle when necessary. Additionally, in many cases, powertrains are sold to vehicle builders and not end-use owners. This means that powertrain-focused manuals may not be helpful for owners or operators, and the information in the manuals may change based on a vehicle's body design.

## IV. The section on required diagnostic communications tools compatibility should be amended to allow for appropriate alternatives.

The proposed ZEP Cert. regulations require that a zero-emission powertrain have "a connector meeting the requirements in subsection (h)(2) of title 13, CCR, section 1971.1, On-Board Diagnostic System Requirements…, with a vehicle controller area network communications protocol that is capable of connection and communication with scan tools…, unless [the manufacturer has] a device permanently installed on the vehicle capable of displaying the information required in section 3.2 without the need for additional diagnostic tools."[8] While these standards may be used by current ICE powertrain and vehicle manufacturers, these standards do not reflect current industry practice for all ZEV manufacturers. As a result of this disconnect in current practices, some manufacturers would be detrimentally impacted by this requirement. We recommend modifying this section to say that the information must be accessible, and include flexibility with how this information is conveyed or accessed (e.g., allow comparable standards or tools, so long as the information is accessible), instead of dictating the way this information must be communicated. For example, one alternative could be ISO 14229-1:2013, Unified Diagnostic Services (UDS), which is based on general diagnostics, instead of emissions communications, and specifies data link requirements of diagnostic services.[9]

In addition, the tools "must be capable of communicating the readings from any voltage and temperature sensors monitoring the battery that are useful for repair or diagnosis…"[10] There might be hundreds of these readings, most of which can be read by a technician with a simple handheld voltmeter or thermocouple. We find it unnecessary, and unduly onerous, to require manufacturers to translate all readings into SAE J1939 or SAE J1979 messages and arrange for them to be communicated over the J1939 or J1979 system. As stated above, we recommend modifying this section to allow for flexibility

[8] Proposed Alternative Certification Requirements and Test Procedures for Heavy-Duty Electric and Fuel-Cell Vehicles and Proposed Standards and Test Procedures for Zero-Emission Powertrains, CARB, December 31, 2018, Appendix D, Part I: Heavy-Duty Zero-Emission Powertrain Certification Requirements, § C, subd. 3.1; see also Appendix C, § 1037.115, subd. (B)(3.1.4).
[9] ISO 14229-1:2013, Road vehicles -- Unified Diagnostic Services (UDS) -- Part 1: Specification and requirements, https://www.iso.org/standard/55283.html.
[10] Proposed Alternative Certification Requirements and Test Procedures for Heavy-Duty Electric and Fuel-Cell Vehicles and Proposed Standards and Test Procedures for Zero-Emission Powertrains, CARB, December 31, 2018, Appendix D, Part I: Heavy-Duty Zero-Emission Powertrain Certification Requirements, § C, subd. 3.2.

with how the information is communicated, so long as the information is accessible in a straightforward fashion.

## V. The section on system monitoring and diagnostics information should be narrowed in scope and only require brief descriptions; and amendment of a certification family should be allowed for major changes.

The Joint Parties support and appreciate the amendments made to the system monitoring and diagnostics information section, particularly the statement that "[t]he requirements in this section do not dictate the monitoring and diagnostics systems that manufacturers must implement."[11] Regarding the remaining informational requirements for certification in sections 2.1 through 2.5, we request clarity regarding minimum basic criteria for certification.

Reporting of system-monitoring and diagnostic components and software strategies is a lengthy and complicated task, as it requires explaining algorithms and logic of extensive software codes. There are numerous sensors and electronics associated with a basic powertrain and while reporting hardware alone is complicated, additional reporting on software strategies is near impossible. The lack of clear framework and boundaries in the current proposal could lead to subjective disapprovals for how this information is reported. In addition, since the ZEV industry is relatively nascent, software strategies are constantly being reviewed and modified and regressions may be frequent. Reporting all changes, potentially resulting in a new certification family, is time consuming and resource demanding, and is a huge constraint on both new entrants to the market and established manufacturers. In addition, because there are no minimum criteria, certification may be withheld if one manufacturer has a less preferred system than another manufacturer or doesn't report enough detail about the system.

We suggest language be added to clarify that this requirement of certification is met so long as the information requested in sections 2.1 through 2.5 is provided at a basic level. Specifically, we recommend that section 2 state that brief descriptions, of not more than one page, or summary flow-charts or tree diagrams (of not more than five layers) are acceptable to illustrate a combination of system monitoring, diagnostic components, and software strategies. Section 2, and specifically subsections 2.2-2.5, could result in hundreds of pages of information, so we emphasize a need for narrowing the scope of what could be requested from manufacturers. Given that there could be many changes to monitoring and diagnostics systems, which would need to be reported in compliance with subsection 2.1 and 2.2, we recommend that subsection 2.1 allow for amendment of a certification family, instead of requiring the creation of a new family. We also recommend that subsection 2.2 be limited in scope so that a summary description of minor changes be deemed acceptable.

[11] Proposed Alternative Certification Requirements and Test Procedures for Heavy-Duty Electric and Fuel-Cell Vehicles and Proposed Standards and Test Procedures for Zero-Emission Powertrains, CARB, December 31, 2018, Appendix D, Part I: Heavy-Duty Zero-Emission Powertrain Certification Requirements, § C, subd. 2.

## VI. The regulations should remain optional for an adequate amount of time and should be reviewed to ensure they are workable and not disruptive to the market.

The Joint Parties urge CARB to ensure that the proposed regulations remain voluntary for an adequate amount of time to ensure they are workable and not disruptive to the market. Although the proposed regulations are drafted as voluntary, it is CARB's intent to tie the regulations to rulemakings and funding programs, such as currently proposed in the Zero-Emission Airport Shuttle Rulemaking.[12] Keeping certification optional, and not tied to either regulations or funding programs, will allow for manufacturers, fleets, stakeholders, and CARB staff to work together to implement the certification process and refine the regulations to ensure they are not disrupting the market. Additionally, as was adopted for the Innovative Clean Transit regulation, we suggest CARB staff report to the Board annually on implementation of the ZEP Cert. program and recommend any adjustments necessary to ensure the program is running smoothly and not negatively impacting the zero-emission medium- and heavy-duty market.[13]

The emissions from internal-combustion-engine vehicles have been regulated for a relatively long period, which has allowed for manufacturers and regulators to work together to improve the effectiveness of those regulations over time to benefit the environment and consumers. These proposed regulations, by contrast, have not been tested in the market. We do not support tying these regulations to any regulatory or incentive program before model year 2023, to allow manufacturers time to implement the procedures necessary to comply with the certification program.

The Joint Parties share CARB's goal of increasing ZEV adoption and accelerating the reduction of greenhouse-gas and criteria-pollutant emissions. However, we believe these proposed regulations could actually delay California's realization of these emissions reductions by imposing increased costs on ZEVs and therefore slowing their entry into the market. We recommend that CARB staff continue to work with stakeholders to improve this proposal to ensure it will promote the development of the zero-emission medium- and heavy-duty market.

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[12] Proposed Zero-Emission Airport Shuttle Regulation, Appendix A: Proposed Regulation Order, CARB, December 31, 2018, § 95690.5, subd. (c). See also Initial Statement of Reasons for the Proposed Alternative Certification Requirements and Test Procedures for Heavy-Duty Electric and Fuel-Cell Vehicles and Proposed Standards and Test Procedures for Zero-Emission Powertrains, CARB, December 31, 2018, pp. ES-3-4, 4-6.

[13] Resolution 18-60, Proposed Innovative Clean Transit Regulation – A Replacement of the Fleet Rule for Transit Agencies, California Air Resources Board, December 14, 2018, pp. 10-11, https://www.arb.ca.gov/regact/2018/ict2018/res18-60.pdf?_ga=2.202009361.1287469223.1550185073-34796372.1502480917.

Thank you for your consideration of our feedback. Please contact me at (916) 551-1943 or hannah@caletc.com if you would like to discuss further.

Sincerely,

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