



December 22, 2023

Keith Roderick and David Chen
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Submitted to [regulatory docket](#)

Re: Zero-Emission Forklift 45-Day Regulatory Package

Dear Mr. Roderick and Mr. Chen,

On behalf of the California Council for Environmental and Economic Balance (CCEEB), thank you for the opportunity to provide comments on the Zero-Emission Forklift 45-Day Regulatory Package (Proposed ZEF Regulation). CCEEB represents both on- and off-road mobile source operators as well as entities producing and delivering electricity, hydrogen fuel, and conventional fuel to meet their customers' needs and to support feasible, cost-effective emissions reductions across sectors. As such, CCEEB has been actively participating in the development of CARB's zero-tailpipe-emission heavy-duty on-road and off-road regulations in the interest of ensuring a smooth-as-possible transition to the next phase of our transportation, goods movement, and energy ecosystem.

To that end, **CCEEB respectfully requests that CARB staff hold a hybrid workshop in the first quarter of 2024 to assist fleets operating vehicles and equipment subject to multiple zero-tailpipe-emission regulations understand:**

- **the applicability of each zero-tailpipe-emission regulation and the timelines for compliance with each;**
- **how CARB plans to implement provisions related to infrastructure in each rule for those entities subject to multiple regulations; and**
- **anticipated future efforts that could overlap with existing requirements.**

CCEEB also hopes such a workshop could be an opportunity to continue to work towards finding greater efficiencies in the work electric utilities and fleets will need to do in partnership to deliver sufficient power to support the many diverse fleets across the state. Given the immediate need to resolve these issues to meet compliance deadlines for deployment, we appreciate CARB's timely attention to this issue.

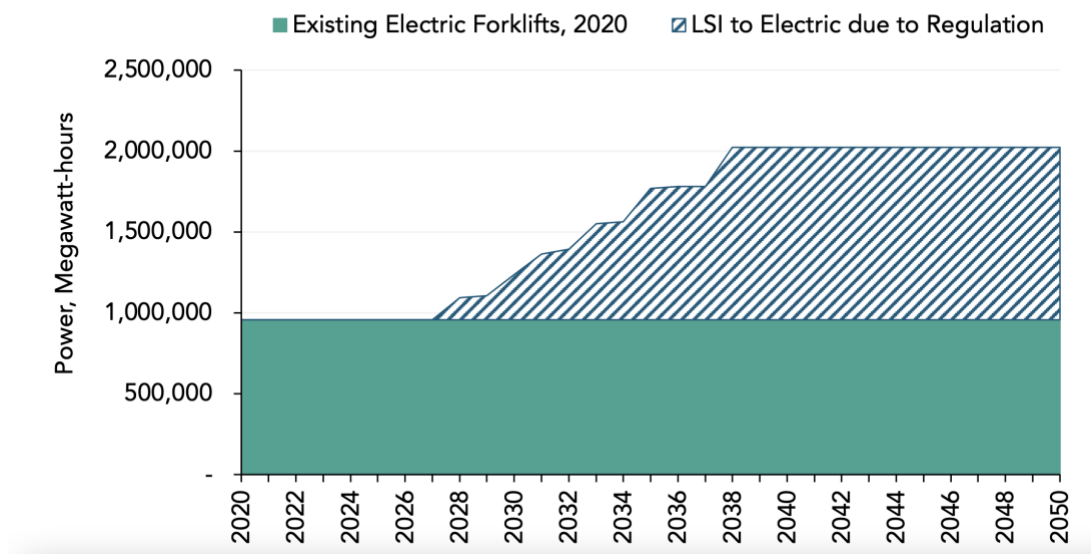
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Cumulative Infrastructure Needs

CCEEB appreciates that CARB staff has presented an assessment of the current energy ecosystem for zero-tailpipe-emission equipment in the Proposed ZEF Regulation Initial Statement of Reasons (ISOR)¹ and modeled the anticipated gridded energy demand resulting from the Proposed ZEF Regulation in the 2023 LSI Forklift Emission Inventory (the 2023 Inventory).² The ISOR recognizes the many concurrent efforts by different agencies and entities underway to support the delivery of statewide electric and hydrogen infrastructure necessary to support CARB’s regulatory requirements. While it’s true that CARB cannot solve the infrastructure challenge on its own, CARB can prevent exacerbating infrastructure deficiencies through allowing for well-planned, feasible transitions for infrastructure end-users, accounting for the fact that most fleet operators are subject to multiple regulations that could result in increased power demand.

The 2023 Inventory indicates that the Proposed ZEF Regulation would approximately double the gridded energy demand from Targeted Forklifts,³ as shown below:⁴

Figure 17. Proposed Regulation impact on gridded energy demand with full implementation



¹ CARB. 2023a. Section F: Zero Emission Infrastructure. Proposed Zero-Emission Forklift Staff Report: Initial Statement of Reasons. pp. 32-48. November 2023. <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/zeforklifts/isor.pdf>

² CARB. 2023b. Appendix D: 2023 LSI Forklift Emission Inventory. Proposed Zero-Emission Forklift Regulation. November 2023. <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/zeforklifts/appd.pdf>

³ It is unclear whether this figure assumes all LSI Forklifts would be transitioned to Battery-Powered Forklifts and thus represents a “maximum” electricity demand increase.

⁴ CARB 2023b, p. 28

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While the 2023 Inventory indicates this demand represents less than half a percent of the current statewide gridded energy demand,⁵ the Proposed ZEF Regulation would be phased in over the same time period as several other significant regulatory programs that would increase reliance on the grid and require increased coordination between fleets and the electric utilities—including CARB’s Advanced Clean Fleets Rule (ACF), CARB’s Ocean-Going Vessels At Berth Regulation (At Berth), and CARB’s 2022 Amendments to the Transport Refrigeration Unit Airborne Toxic Control Measure, in addition to other existing and potential CARB and District-level regulations.

The Proposed ZEF Regulation seems to recognize this overlap, as it requires in §3006(c)(2) that a Fleet Operator or Rental Agency contact—or “may have” the “entity responsible for electrical infrastructure at the operating location” contact—⁶the applicable electric utility provider by March 31, 2026 with information not only for the estimated power demand for infrastructure needed to charge or fuel ZEFs, but with “information on other new sources of power demand anticipated during the applicable phase-out period(s).” Given all of the adopted zero-tailpipe-emission rules that would come into effect over the Proposed ZEF Regulation’s phase out period (2028-2038), including ACF, this is a significant request, one that depends entirely on CARB’s interpretation and enforcement discretion in *wholly separate rules*.

CARB has pointed to the inclusion of extensions to allow for site electrification delays to allay fleet concerns that compliance depends on receiving timely responses, and adequate power, from the electric utilities. The Proposed ZEF Regulation has such a provision in its Infrastructure Site Electrification Delay Extension in §3007(b)(3)(B). In order for a Fleet Operator to qualify for this extension, the Fleet Operator or “entity responsible for infrastructure at the operating location” would have to formally request from the electric utility provider the power necessary to meet its compliance obligations for the Proposed ZEF Regulation on certain time frames as follows:

- For the January 1, 2028 compliance date, by January 1, 2027,
- For the January 1, 2029-January 1, 2036 compliance period, at least two years prior to the compliance date, and
- For the January 1, 2038 compliance date, by January 1, 2034

CCEEB agrees that early dialogue between the electric utilities and fleet operators is critical for implementation of all regulations that will increase demand for electricity. However, CARB’s own regulatory requirements serve to complicate, rather than ease, the path forward to provide comprehensive, accurate estimates of fleet energy demand to the utilities.

As an example, assume a fleet operates more than 50 sites statewide and is subject to the Proposed ZEF Regulation, ACF, and At Berth. This fleet could be served by five utilities (some investor owned, some public); operate in a variety of terrain, climate, and duty-cycles; and

⁵ CARB 2023b, citing the 2021 Total System Electric Generation from CEC at <https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2021-total-system-electric-generation#:~:text=Total%20system%20electric%20generation%20is,or%205%2C188%20GWh%2C%20from%202020>

⁶ It is not clear how it would be determined who is “responsible for infrastructure” at a particular location.

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own/operate thousands of vehicles, forklifts, and ships. ACF requires that fleets subject to that regulation deploy as many ZEVs as the utility indicates it can provide power to support.⁷ The Proposed ZEF Regulation contains a similar provision in §3007(b)(3)(B)(1)c. In addition, ACF requires and the Proposed ZEF Regulation would require that a multi-site fleet must evaluate what power could be supplied to each of its sites to confirm that no site can support additional upgrades prior to CARB's granting of an extension for a particular site. This raises the following questions:

- If a utility can only provide a limited amount of power to a facility, and that level of electrification isn't sufficient to power all of CARB's requirements, how does an entity choose which regulation to comply with and which one to apply for an exemption? Or do they need to apply for exemptions for all the regulations and let CARB decide?
- How will CARB address the circumstance where one utility can provide x% of power for forklift needs, y% of power for vehicle needs, and z% of power for At Berth needs, but another utility can provide different percentages for some or all of these?

The Proposed ZEF Regulation would require that extension requests for site electrification delays, infrastructure construction delays, ZEF delivery delays, and technical infeasibility be submitted no more than 90 days prior to the compliance date, and CARB has 45 days to respond.⁸ Other regulations also contain extensions and exemptions that will be granted based on Executive Officer discretion. While CCEEB agrees that these types of extensions are necessary to facilitate compliance with the zero-tailpipe-emissions rules as written, the fact that each extension/exemption would be granted on a case-by-case, discretionary basis means that fleets will not know what or where they are required to make infrastructure upgrades until three to five months prior to the compliance date. This is simply not feasible for fleets and could result in a barrage of last-minute changes in requests to the electric utilities.

As demonstrated by several hours of discussion at CARB's recent Truck Regulation Implementation Group meetings on December 4th and December 8th, 2023 related to ACF,^{9,10} most fleet operators continue to have questions about what documentation CARB will consider sufficient to show that fleets are working with the utilities—and concerns about what is required to receive such documentation—as well as what will happen if there are significant delays in delivering the necessary power to their operations. CCEEB suggests CARB provide flexibility to entities that have made good-faith efforts to provide documentation to the utilities. In addition, given these concerns are not just an issue for one regulation, we reiterate our ask that CARB staff host a workshop to help fleets understand how to comply with multiple, overlapping zero-tailpipe-emission rules. A comprehensive discussion should facilitate further discussions about what we anticipate collectively learning over the next few years of implementation and how those lessons learned could inform ongoing zero-tailpipe-emission rule development.

⁷ 13 CCR 2015.3(c)(2)

⁸ See Proposed ZEF Regulation, §3007

⁹ <https://youtu.be/ZMlIR014-0U>

¹⁰ <https://youtu.be/DEvxQForIqY>

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Upstream Emissions Comparison: Well-to-Tank Criteria and GHG Emissions Analysis

CCEEB appreciates that CARB has included a robust discussion of the Proposed ZEF Regulation's impact on "total well-to-wheel emissions."¹¹ When based on commonly understood and replicable inputs and assumptions, well-to-tank emissions—in this case, emissions from in-state California electricity generation and production of California liquid propane gas—should play just as important of a role in understanding the criteria pollutant and greenhouse gas emissions impacts of CARB regulations as tank-to-wheel, or tailpipe, emissions.

Given this is one of the first instances in which CARB has provided a well-to-tank analysis for criteria pollutants at this level of detail in a regulatory analysis, and that the GREET model is typically used in other, GHG-focused regulatory contexts, it would be helpful for staff to provide more detail on the assumptions, inputs, and modeling that supported this assessment, including where and how GREET, CEPAM, or other models and sources of data used to arrive at the emissions presented in this section. In doing so, it would also be helpful for staff to explain why the air quality and greenhouse gas analyses supporting the Proposed ZEF Regulation only include one portion of the total well-to-wheel emissions: tank-to-wheel, or tailpipe emissions.

Additional specific questions and comments on the Proposed ZEF Regulation are below.

Comments on Regulatory Language

§3007(a)(1) Low-Use LSI Forklift Exemption

The Proposed ZEF Regulation should clarify in §3007(a)(1) that low-use targeted forklifts are not only exempt from the general LSI forklift prohibition of §3002(b), but also the phase-out provisions in §3006.

CCEEB is unclear what the emissions benefits would be from 1) limiting the low-use exemption to 2013 through 2025 MY LSI Forklifts, and 2) sunseting the low-use exemption on December 31, 2030. Fleet Operators have spent significant funds to retrofit existing LSI forklifts to meet the existing LSI Engine Fleet Requirements Regulation's (existing LSI Regulation) Fleet Average Emissions Level (FAEL), some of which have been transitioned to low-use. Units that have been retrofitted to 1.0 to 2.0 g/bhp-hr should be allowed access to the low-use provision in the Proposed ZEF Regulation.

CARB points to the existing LSI Regulation to support phase-out of LSI Forklifts 2012 MY and older from being able to be classified as low-use,¹² but the existing LSI Regulation is a fleet average rule; the latest certification was for 2010 or newer engines, and the rule permitted retrofits for previous model years to reach a fleet average, the FAEL, which since 2013 has been 1.1 g/bhp-hr for Large Fleets and 1.4 g/bhp-hr for Small Fleets.¹³

¹¹ CARB 2023a, p. 49

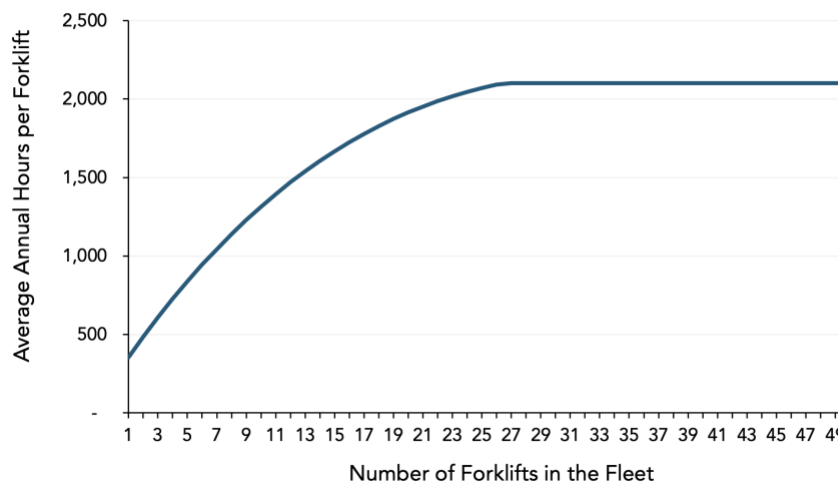
¹² CARB. 2023c. Appendix E: Purpose and Rationale for Each Regulatory Provision. Proposed Zero-Emission Forklift Regulation. p. 38. November 2023. <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/zeforklifts/appe.pdf>

¹³ 13 CCR 2775

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While the 2023 Inventory does not explicitly describe the emissions benefits expected from the Proposed ZEF Regulation's restrictions on low-use provisions, it does provide relevant information on typical LSI Forklift activity. Where the 2023 Inventory does not have real-world data on annual hours of operation for a fleet, it relies on average hours of operation by fleet size.¹⁴ According to those averages, LSI Forklifts in both Small Fleets and Large Fleets operated on average anywhere from twice to 10 times as many hours as a low-use LSI Forklift, as shown in Figure 5 from the 2023 LSI Forklift Emission Inventory, shown below:¹⁵

Figure 5. 2020 DOORS annual average activity hours per forklift curve by fleet size



Given the exhaust emission factors used in the 2023 Inventory are based on both activity hours and accumulated hours, it seems likely that low-use LSI Forklifts would result in meaningfully lower emissions than non-low-use LSI Forklifts. Furthermore, as previously mentioned, many of the 2012 MY and older LSI Forklifts have been retrofitted to 1.0 to 2.0 g/bhp-hr. Given these parameters, please clarify what the expected emissions benefits would be from prohibiting 2012 MY and older that have been retrofitted with emissions controls to meet the existing LSI Regulation's standards from being classified as low-use under the Proposed ZEF Regulation.

Lastly, low-use provisions are important—and will continue to be important past 2030—to those Fleet Operators who require only occasional usage of LSI Forklifts in order to preclude employees from using more labor-intensive, riskier, manual approaches to move heavy items. While renting may be an option for work planned in advance, planning for movement of material days in advance is not typical for businesses that may need to move an item due to access restrictions or as part of shipping or receiving. Please clarify what the expected emissions benefits would be from sunseting the low-use exemption.

¹⁴ CARB 2023b, p. 12

¹⁵ CARB 2023b, p. 13

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§3008(j) Inclusion of a Requirement to Justify Additions of Diesel-Fueled Forklifts

CCEEB is unclear as to why §3008(j) is necessary to include in the Proposed ZEF Regulation. Along with reporting requirements for new Diesel Forklifts, the Proposed ZEF Regulation would require a Fleet Operator or Rental Agency to provide to CARB:

(3) Information and documentation demonstrating one or more of the following:

(A) An LSI Forklift is not capable or suitable for the operation to be served by the Diesel Forklift based on Forklift Specifications.

(B) No Forklifts currently in operation at the operating location use propane, gasoline, or other fuel formulated for LSI engines.

This is more than a mere reporting requirement, as it would seem to suggest that CARB could in some cases prevent the acquisition and/or use of a new Diesel Forklift if an LSI Forklift was “capable or suitable for the operation,” particularly if there are any other LSI Forklifts at the operating location. Yet ISOR specifically states that the Proposed ZEF Regulation does not apply to Diesel-Fueled Forklifts.¹⁶ The ISOR also describes why it is unlikely that fleets will replace LSI Forklifts with Diesel Forklifts over ZEFs, and notes that “any replacements of LSI forklifts with diesel forklifts that do occur would be subject to the current “Adding Vehicle” requirements in CARB’s Off-Road Diesel Regulation, which are aimed at ensuring only newer, cleaner vehicles can be added to fleets.”¹⁷

It is unclear, based on the definition of “Fleet Operator” in §3001(a), if the justification requirement in §3008(j) applies only to those fleets that operate both LSI and Diesel Forklifts or any fleet that operates Diesel Forklifts. If the latter, it’s possible many Diesel Forklift operators are not aware there may be new requirements applicable to those forklifts, given the scope of the Proposed ZEF Regulation CARB has described. It would appear to CCEEB that CARB should have adequate access to diesel forklift inventory information through DOORS and the requirements of the In-Use Off-Road Diesel-Fueled Fleets Regulation such that this section is not necessary.

§3006 Inclusion of Class IV Forklifts with a lift capacity of greater than 12,000 pounds

During the informal rulemaking period, CARB staff had proposed to exclude Class IV Forklifts with a lift capacity of greater than 12,000 pounds from the phase-out requirements, given limited commercial availability of ZEFs in that configuration. In the ISOR, staff indicates that these Forklifts are now included in the phaseout schedule because “a more recent survey of available ZEFs has shown that several manufacturers currently offer Class-IV-equivalent ZEF with a lift capacity of more than 12,000 pounds.”¹⁸ In order to better understand what threshold staff is using to determine that a ZEF is commercially available, please provide a citation to the recent survey data referenced in the ISOR that includes the number of models available and the estimated incremental cost differential relative to a Class IV LSI Forklift lift capacity of more than 12,000 pounds.

¹⁶ See CARB 2023a, p. 7, p. 9, p. 16, p. 27, p. 48, and others.

¹⁷ CARB 2023a, p. 49

¹⁸ CARB 2023a, p. 110

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§3007(b)(4) Technical Infeasibility Extension

CCEEB appreciates staff's inclusion of this extension to allow flexibility for Fleet Operators as they transition to ZEFs. Fleet Operators must submit the following documentation to demonstrate to CARB that no commercially available ZEF model can be used in place of an LSI Forklift within 45-90 days of the compliance date:¹⁹

- a. *Entity information specified in Section 3009(b)(1);*
- b. *For the LSI Forklift for which the extension is being requested:*
 - i. *Forklift information specified in Section 3009(b)(2) or EIN, as applicable; and*
 - ii. *Primary operating location address;*
- c. *A detailed description of the operation in which the applicable LSI forklifts operate, including site maps with operating areas, forklift storage areas, and areas of concern identified; a description of the potential operational and safety issues; a description of the nature of the work or duty cycle; a description of the operating environment; and a detailed explanation of how the need for Technical Infeasibility Extensions has been minimized;*
- d. *A detailed description of the required characteristics a Forklift must have in order to perform the work effectively and/or safely;*
- e. *An explanation as to how the fleet operator will manage applicable LSI forklifts such that they only perform the operation covered by the Technical Feasibility Extension;*
- f. *A comprehensive market evaluation and determination using engineering judgement that demonstrates that no available ZEF models of similar configuration as the LSI Forklift to be phased out is capable of being as effective and/or safe as said LSI Forklift (evaluation shall be completed based on ZEF model availability within the six-month period immediately preceding the upcoming compliance date);*
- g. *Statements or information from applicable Forklift manufacturers, Dealers, insurance companies, and/or other entities substantiating the operational or safety issues cited in the extension request; and*
- h. *As applicable, forklift specification sheets, copies of warranty conditions, leasing criteria, and/or other documentation and information supporting the request.*

If the Fleet Operator desired to renew the extension, the Fleet Operator would be required to complete a new market evaluation focused on ZEF model availability within six months prior to the expiration date of the existing extension.²⁰

These requirements pose several potential challenges. If a Fleet Operator cannot submit their extension request until 90 days prior to the compliance date, and CARB has 45 days to respond, Fleet Operators will have between one and three months to change course should CARB reject their extension request. Given the Proposed ZEF Regulation relies on long-lead time activities,

¹⁹ See Proposed ZEF Regulation, §3007(b)(4)(D)1

²⁰ See Proposed ZEF Regulation, §3007(b)(4)(D)2

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including delivery of zero-tailpipe-emission equipment, installation of charging/refueling infrastructure that needs to conform to the specific equipment model, and, most likely, power upgrades to the site, this timeline does not seem feasible for Fleet Operators nor will it increase certainty for all entities in the energy and equipment supply chain.

Similarly, while CCEEB understands CARB's concern that evaluating available ZEF models too early risks "pre-judging" the market, Fleet Operators need more than six months to plan for compliance, and limiting the market evaluation to that time period is unlikely to leave enough time for a fleet to order and take delivery of equipment if they do identify a ZEF that meets their needs.

We appreciate that this extension would allow submission of one extension request for identical equipment types, particularly given the extensive market analysis and use case descriptions CARB would require Fleet Operators to provide to qualify for this extension. CCEEB believes that CARB's extension determination should be granted automatically to other Targeted Forklifts that are similarly unavailable given market evaluations CARB has deemed appropriate for a particular timeframe and use case. Doing so will make both Fleet Operators' and CARB staff's work much more efficient, and go further towards ensuring that Fleet Operators with the same use cases are treated equally under the Proposed ZEF Regulation.

Lastly, none of these considerations allow for an infeasibility determination based on prohibitive costs, be that for a ZEF or for the infrastructure to support the ZEF. CCEEB remains concerned that CARB does not account for prohibitive cost in any exemption or extension.

§3001(a) Definition of Fleet

In order to incentivize early action to transition LSI Forklifts to ZEFs, the proposed rule should not include ZEFs for the purposes of determining the size of the fleet.²¹

§3010 Labeling Requirements

Please clarify if any existing EIN labels issued and utilized to comply with the existing LSI Regulation serves to meet any EIN requirements under the Proposed ZEF Regulation.

§3001(a) Declared Emergency Event & Emergency Operation

CCEEB appreciates that staff has provided a provision specific to Dedicated Emergency Forklifts. However, the definition of emergency operation are overly restrictive in that it limits emergency operations to those declared by a government body, Governor, or President pursuant to California Government Code Section 8558. The ZEF Regulation, like the In-Use Off-Road Diesel-Fueled Fleets Regulation,²² should recognize the need for emergency operations to support activities necessary to prevent public health risks, as supported by appropriate recordkeeping and reporting for CARB's verification. Similarly, there should be such an allowance for all fleet operators, not only government agencies and entities operating under the authority of a governmental agency.

²¹ ZEFs are interpreted to count towards fleet size based on the definition of "fleet" and the applicability provision in §3006(c).

²² 13 CCR 2449(c)(18)

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We suggest the ZEF Regulation use the following definition for emergency operations, from the In-Use Off-Road Diesel-Fueled Fleets Rule as amended in 2022, and that it apply to all Fleet Operators:

- (A) Any activity conducted during emergency, life threatening situations, where a sudden, unexpected occurrence that poses a clear and imminent danger, requiring immediate action to prevent or mitigate the loss or impairment of life, health, property, or an essential public service; or in conjunction with any officially declared disaster or state of emergency, as declared by an authorized health officer, agricultural commissioner, fire protection officer, or other authorized health officer;
- (B) Any activity conducted by essential public and private service utilities to provide electricity, natural gas, broadband and telephone, water, or sewer during periods of service outages and emergency; or
- (C) Operations including repairing or preventing damage to roads, buildings, terrain, and infrastructure as a result of an earthquake, flood, storm, fire, other infrequent act of nature, or terrorism. Routine maintenance or construction to prevent public health risks does not constitute emergency operations.

Reporting Fleets in DOORS

Under the existing LSI Regulation, fleets are aggregated based on where purchasing decisions are made, so fleets reported in DOORS are reported by facility. The Proposed ZEF Regulation would aggregate fleets at the parent company level. CCEEB recommends that DOORS allow reporting under the Proposed ZEF Regulation at the parent company level and at the site/facility level such that Fleet Operators could determine which is the most appropriate reporting mechanism for their particular situation.

Thank you for your consideration of our comments. Given that the Proposed ZEF Regulation is not scheduled for a Board Hearing until June 27, 2024, we look forward to having time to work through resolution to the above-mentioned comments and questions with staff prior to the Board Hearing. If you would like to discuss our comments, please feel free to contact me at christinew@cceeb.org or 415-940-0501.

Sincerely,



Christine Wolfe
Policy and Communications Director
CCEEB

cc:

Analisa Bevan, CARB
CCEEB Air Project Members