

April 26, 2023

Liane Randolph
Chair
Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Proposal relating to Class 3 Locomotive Fleets to Speed and Increase Emissions Reductions and Accelerate Zero Emission Locomotive Adoption while Reducing Costs

Dear Chair Randolph,

This letter provides supplemental information to the Governing Board to further support and explain the emissions and cost benefits of the proposal contained in our 15-day comment letter of March 16, 2023. Both letters address the California Air Resources Board's ("CARB") Proposed In-Use Locomotive Regulation as updated by the proposed 15-day changes made available March 1, 2023 (the "Proposed Regulation"). Sierra Northern Railway ("Sierra") has appreciated the opportunity to engage in dialogue with CARB staff and leadership regarding Sierra's proposal that CARB add an early adopter milestone ("Early Adopter Milestone") to the Alternative Fleet Milestone Option ("AFMO"). This letter provides information that is responsive to questions and feedback received from CARB.

The Early Adopter Milestone would establish an accelerated first milestone in 2025 to facilitate emission reductions up to five years earlier than the Proposed Regulation. Rather than establishing only the 2030 milestone as proposed in the 15-day change, a Class 3 fleet could opt to meet either a 2025 or 2030 milestone:

- Beginning in 2025, 100 percent of annual fleet usage in California must be from Tier 3 (or cleaner) locomotives (the "Early Adopter Milestone"), or,
- Beginning in 2030, at least 50 percent of annual fleet usage in California must be from Tier 4 (or cleaner) locomotives, (the CARB proposed "2030 Milestone").

The three remaining AFMO milestones in the Proposed Regulation would remain unchanged.

Through the integration of the Early Adopter Milestone into the Proposed Regulation, CARB would:

- Provide a compliance pathway that achieves approximately 30% greater particulate matter ("PM") and 15% greater oxides of nitrogen ("NOx") emissions reductions on a cumulative basis than direct regulatory compliance.
- Begin delivering the PM and NOx emissions reductions five years sooner to impacted communities.
- Catalyze a rapid transition to 100% zero emission ("ZE") locomotives that occurs 12 years earlier than direct regulatory compliance.
- Dramatically reduce the costs of the transition to ZE locomotives by 37%.



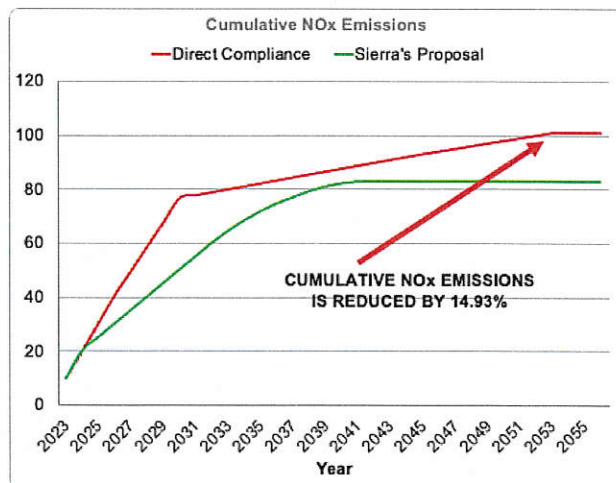
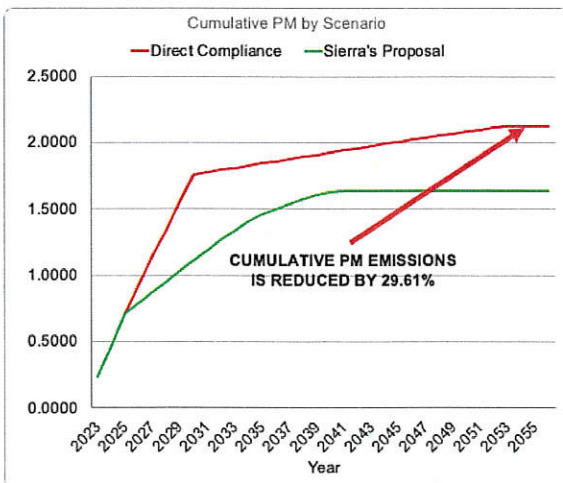
Sierra Northern's Locomotive Strategy

Over the past the two and a half years, Sierra has been deeply engaged in participating in the In-Use Locomotive rulemaking and assessing the Proposed Regulation and its implications for the railroad. This active engagement on commercial, technical, and regulatory issues has enabled Sierra to develop a cost-effective strategic transition to ZE locomotives that is more rapid than CARB has proposed in the Proposed Regulation. The key components of this strategy are:

- An immediate phase-out of pre-Tier 0 locomotives that are responsible for approximately 85% of the Class 3 NOx emissions in California¹
- A leapfrog over Tier 4 locomotives which are less fuel efficient than Tier 3's, require additional maintenance, and are not ZE locomotives
- A steady phase in of ZE locomotives that is more rapid than direct regulatory compliance with the Proposed Regulation and achieves 100% ZE locomotives in 2042, 12 years sooner than direct regulatory compliance in 2054

To quantitatively measure the benefits of its strategy, Sierra engaged Zero Emission Advisors ("ZEA") to provide a comprehensive emissions modeling analysis of Sierra's plan to rapidly transition out of its older locomotives to Tier 3 locomotives, then progressively transition from a Tier 3 fleet to a zero emission ("ZE") fleet of hydrogen locomotives. ZEA is a consulting firm dedicated to helping governments and businesses transform how they use energy and fuel.² The following analyses are based on the profile of an average California short line (Class 3) railroad consisting of six pre-Tier 0 locomotives, three Tier 3 locomotives, and one Tier 4 locomotive. This short line profile aligns with CARB's analysis of the California's Class 3 railroad inventory. The analysis utilizes fuel usage rates based on Sierra's projected use and is based on the assumptions further described in our March 16th comment letter.

The following charts depict the PM and NOx benefits of the Early Adopter Milestone as compared to direct regulatory compliance.



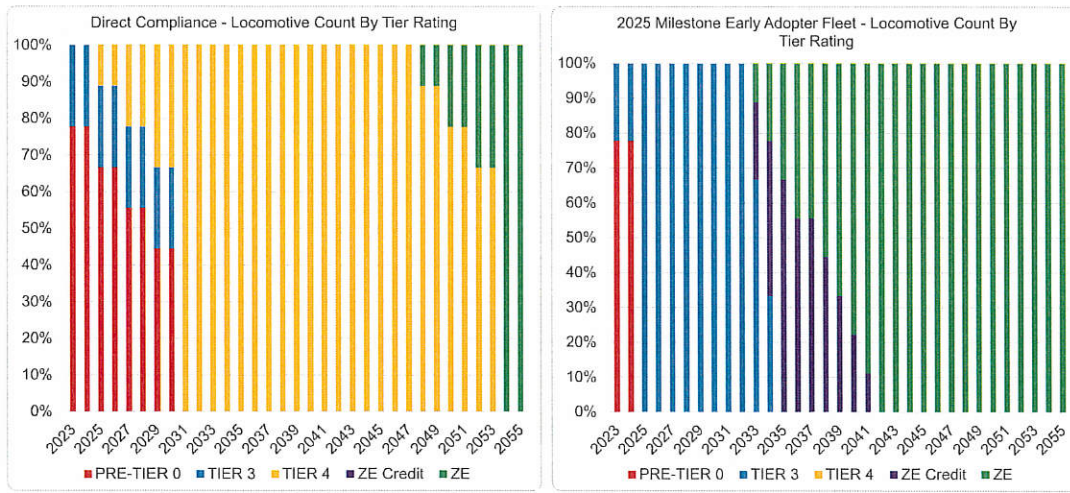
¹ See CARB Air Quality Planning and Science Division, "2020 Locomotive Emissions Inventory," (September 3, 2020), at slide 42, available at <https://ww2.arb.ca.gov/sites/default/files/2020-09/CARBlocoinvwebinar2020.pdf>

² See Zero Emission Advisors website, "ZEA Services Platform," at <https://zeroemissionadvisors.com/pages/services>



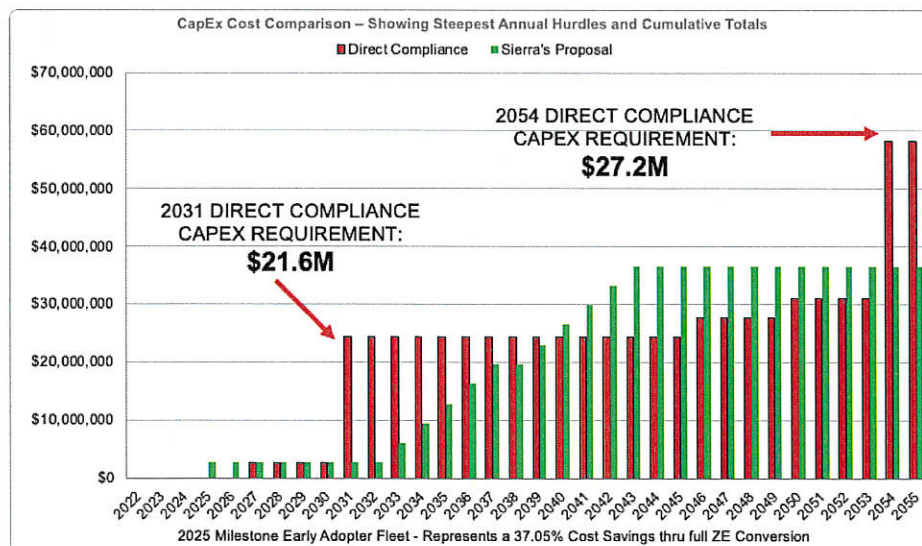
Fleet Transformation

The following graphic compares the transition from the current California Class 3 fleet that is dominated by pre-Tier 0 locomotives fleet to the zero-emission locomotive fleet of the future based on direct regulatory compliance vs. the Early Adopter Milestone. The ZE Credit provision of the AFMO (illustrated in purple) enables a Class 3 fleet to garner credits from ZE locomotives to modestly extend the useful life of Tier 3 locomotives and thereby transition to ZE locomotives more rapidly.



Savings to the Short Line Industry and California Citizens

Due to the structure of the Proposed Regulation, direct regulatory compliance will require short line fleets to transition suddenly to Tier 4 requiring substantial capital expenditures, and then again to completely transition to ZE locomotives just 23 years later with another round of massive capital expenditures. In contrast, the Early Adopter Milestone speeds the transition to ZE locomotives and provides over 37% reduction of capital expenditures.





Questions Raised Re: Early Adopter Milestone

During the course of our recent discussions with CARB staff and leadership regarding the Early Adopter Milestone, two primary questions were raised:

1. Would the Early Adopter Milestone be available to all locomotives in California, or only to Class 3 short line railroads?
2. Since this proposal reduces both PM and NOx emissions sooner and more substantially than direct regulatory compliance, could this same result be accomplished under the Alternative Compliance Plan provision?

Emissions Performance of Early Adopter Milestone in Class 1 vs. Class 3 Railroads

While the emissions analysis developed by Zero Emission Advisors for Sierra pertaining to the benefits of the Early Adopter Milestone focused initially only on Class 3 short line railroads to support our March 16th letter, that analysis was expanded to examine Class 1 railroads since this issue was raised by CARB.

The ZEA analysis for Class 1 railroads determined that the Early Adopter Milestone could increase NOx emissions from Class 1 railroads because the Class 1 inventory consists of extremely few pre-Tier 0 locomotives, but instead consists of:

- 75% older locomotives spread between Tier 0 and 0+, Tier 1 and 1+, Tier 2 and 2+
- 25% newer locomotives including 19% Tier 3's and 6% Tier 4's.³

This California inventory is consistent with the federal inventory figures that the EPA cited in Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles- Phase 3 proposal and the distinction the EPA drew between older locomotives vs. the Tier 3 and Tier 4 locomotives that are subject to more stringent emission standards:

Not surprisingly, recent fleet profile data shows that the in-service locomotive fleet continues to be dominated by Tier 2 and earlier locomotives subject to EPA's less stringent emission standards.⁴ According to data supporting EPA's 2020 National Emission Inventory, there are 16,787 locomotives in the Class I line-haul fleet. Of these, about 26 percent are Tier 3 or Tier 4 locomotives subject to more stringent emission standards. The other 74 percent are Tier 2 or earlier locomotives, broken down as follows: About 62 percent are remanufactured to the revised remanufacture standards adopted in 2008; 11 percent have not been remanufactured and continue to have the higher emissions of their original certification tier; and a small number, about 1 percent, are unregulated (pre-1973) locomotives. Class II and III railroads are not generally subject to remanufacturing

³ See CARB Air Quality Planning and Science Division, "2020 Locomotive Emissions Inventory," (September 3, 2020), at slide 8, available at <https://ww2.arb.ca.gov/sites/default/files/2020-09/CARBlocoinvwebinar2020.pdf>

⁴ 2020 National Emissions Inventory Locomotive Methodology Prepared for U.S. Environmental Protection Agency by Eastern Research Group, Inc. (May 19, 2022). https://gaftp.epa.gov/air/nei/2020/doc/supporting_data/nonpoint/Rail/2020_NEI_Rail_062722.pdf. (footnote from original).



obligations. To the extent one of these railroads purchases a locomotive that was previously certified to EPA's standards, then the railroad must ensure the locomotive continues to comply with those standards.⁵

We therefore are limiting our Early Adopter AFMO proposal only to Class 3 Railroads. This change would necessitate that the following definition that was dropped in the 15-day changes again be included in the Proposed Regulation:

"Class I, Class II, or Class III Railroad" is defined by the Surface Transportation Board pursuant to Title 49, Code of Federal Regulations, section 1201 Railroad Companies, 1-1 Classification of carriers, which is incorporated by reference; the class is based on the carrier's annual operating revenues.

Comparison of AFMO and ACP Compliance

We appreciate CARB's recommendation that Sierra consider an Alternative Compliance Plan ("ACP") as a regulatory compliance strategy. However, ACP has multiple deficiencies when compared with the AFMO structure coupled with an Early Adopter Milestone:

- The AFMO structure enables a long-term compliance plan that extends to complete transformation to a 100% ZE locomotive fleet in 2042.
- The AFMO structure provides a bright line rule that if a Fleet Operator meets modernization requirements and other program requirements by specified dates, that fleet is in compliance.
- In contrast, the ACP structure provides for short-term plans that can only extend for five years or less. Each ACP is reviewed and approved by CARB.
- As a result of these factors, the ACP precludes a Locomotive Operator from being able to develop and execute a long-term plan with confidence that the future series of ACPs will receive CARB approval.

Conclusion

We appreciate the opportunity to submit these comments and remain available for additional engagement regarding the Proposed Regulation and the opportunities that exist to enhance the benefits, and to reduce the costs, to Californians of transitioning California's short line fleet.

Sincerely,

A handwritten signature in blue ink, which appears to read 'Graham Noyes', is located below the 'Sincerely,' text.

Graham Noyes

Cc: Michael Hart, President and CEO, Sierra Railroad Company
Kenneth Beard, CEO, Sierra Northern Railway

⁵ U.S. Environmental Protection Agency, "Proposed Rule: Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles- Phase 3," at p. 513-514 (footnotes 1017-1019 omitted), available at <https://www.epa.gov/system/files/documents/2023-04/hd-ghg-veh-phase-3-nprm-2023-04.pdf>