

February 13, 2015

Michael S. Waugh, Chief  
Transportation Fuels Branch  
California Air Resources Board  
1001 "I" Street  
Sacramento, CA 95814

Subject: Low Carbon Fuel Standard Energy Economy Ratio Update

Dear Michael Waugh and LCFS Staff,

Thank you for the opportunity to provide comments on the Low Carbon Fuel Standard (LCFS) program. We strongly support the goals of the LCFS program and applaud programs within the California Air Resources Board (ARB) that provide needed incentives to reduce the carbon intensity of fuels to help achieve California's health based air quality standards and aggressive greenhouse gas emission goals.

Proterra is the leading U.S. manufacturer of zero-emission commercial transit solutions and makes the world's first all-electric, fast-charge public transit bus. These buses are currently in service in California at Foothill Transit and Stockton RTD, as well as many locations throughout the country. Proterra's buses charge along their routes in less than 10 minutes with an automated roof top charger and then continue on their routes all day long, offering functionally unlimited range. Proterra's CATALYST bus achieves 21+ miles per gallon equivalent performance, 500%+ better than diesel and CNG buses. In addition, Proterra's advanced technology reduces carbon emissions by 70% or more compared to CNG or diesel buses. Zero-emission transit buses provide the opportunity for all Californian's to ride an electric vehicle and realize the health and other associated benefits.

We appreciate ARB updating the Energy Economy Ratio (EER) for heavy-duty battery electric vehicles and request ARB increase the EER to adequately reflect the miles per diesel equivalent of fast-charge battery electric compared to diesel transit buses. The proposed EER of 4.2 for heavy-duty battery electric buses does not accurately represent the real ratio between new fast-charge battery electric buses and new diesel transit bus fleets. The proposed EER for heavy-duty battery electric buses averages the EER among battery electric buses – Proterra and BYD. To help ensure an equal comparison, we recommend averaging the fuel economy across all similar Altoona-tested diesel buses, including Gillig and Nova—in addition to New Flyer. Based on the Altoona testing for the most recent 40ft, low-floor, diesel buses over the three test cycles identified by ARB (Central Business District, Arterial, and Commuter), the Gillig bus averages 4.74 MPG, Nova 2.97 MPG, and New Flyer 4.82 MPG, generating an overall average of 4.18 MPG. Using the average 20.33 MPG diesel equivalent for battery electric transit buses and the average 4.18 MPG for diesel transit buses, we respectfully request updating the EER to at least 4.86 for heavy-duty, battery electric vehicles in

order to provide an equal comparison of battery electric and diesel transit buses and accurately recognize the significant fuel efficiency and air quality benefits of zero-emission transit buses.

But even an EER of 4.86 does not accurately capture the unique fuel efficiency gains associated with Proterra's fast-charge technology. Therefore, we further request the consideration of a separate LCFS category for fast-charge, battery-electric buses, similar to ARB's additional incentive for fast-charge in the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP), in order to recognize the technology's functionally unlimited range, efficiency, and greater miles per gallon diesel equivalent. Charging along the route in less than 10 minutes allows the fast-charge, battery-electric buses to operate continuously – similar to a fuel cell or other long-range advanced technology. In addition, the buses have greater efficiency and MPG equivalent due to their light weight and advanced technology, as the fast-charge, battery-electric transit buses have fewer batteries and less weight on-board the vehicle. Therefore, we strongly encourage recognizing a separate LCFS category for fast-charge, battery electric buses with an EER of 5.2—using the 21.72 MPG diesel equivalent achieved at Altoona under three identified test cycles and the average diesel transit bus at the same test cycles of 4.18 MPG.

We thank you for the opportunity to provide comments on the Low Carbon Fuel Standard, and appreciate the efforts of the California Air Resources Board to reduce the carbon intensity of fuels to support California's climate goals, help clean the air, and promote clean, low-carbon fuels to improve California's energy security and energy independence.

Sincerely,



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