CARB LCFS Public Workshop Comments November 5, 2020

Company Comments

Company Name: **GreenPower Motor Company**

Company Vision: Advancing the adoption of electric vehicles by making battery-electric buses and trucks affordable, durable, and the most efficient.

Contact: **Lisa McGhee**, Business Development
Phone: (714)881-4856 / Email: Lisa@GreenPowerBus.com
8885 Haven Ave, Suite 150, Rancho Cucamonga, CA 91730

Company Website: greenpowerbus.com

Locations: **Headquarters:** Vancouver, British Columbia, Canada
Manufacturing Facility: Porterville, California
Sales and Administration Office: Rancho Cucamonga, California

Deliveries: GreenPower has delivered **ninety-seven (97)** heavy and medium duty electric vehicles that include its EV Star Mini Bus, the EV250 and EV350 Transit Buses, Synapse School Bus, and EV Double-Decker Bus.

Company Overview:
GreenPower Motor Company is a zero emissions electric bus manufacturer that offers a full line of purpose-built battery-electric vehicles that cater to the transportation needs of public transit agencies, school districts, and private sector transit and shuttle operations. GreenPower was founded in 2010 with the purpose of bringing the most compelling zero emissions buses to market. In fact, GreenPower is the only manufacturer in North America that produces electric buses for transit, shuttle, tourist, and school operations.

The EV Stars (Class 4), GreenPower's flagship model, have successfully been delivered to the Port of Oakland, UC San Francisco, the Sacramento Regional Transit District (SacRT), and the San Diego Airport Parking Company.

GreenPower designs, builds, markets, and supports electric vehicles that not only meet the operational demands of transporting passengers; our vehicles do so with unmatched safety and efficiency.

GreenPower's buses are designed to be the most reliable vehicle of its class on the road. GreenPower has spent considerable time and money to ensure that all of the systems in our electric buses use reliable and state of the art components. The majority of these components have been sourced from manufacturers who have years of applicable experience in the manufacture of transit vehicles. GreenPower's electric buses well exceed any environmental compliance standards and regulations.

GreenPower has spent a considerable amount of time and resources in developing its production and supply chain processes to have a streamlined procedure while aiming to achieve a highly efficient performing product.

`

Comments

1. Request to adjust EER energy efficiency values with EO Testing.

To actually achieve EV EER energy efficiency benefits that are aligned with the EO EV testing vehicle, GreenPower Motor Company request an analysis of the facts regarding the energy efficiency of the EV technology to the credits generated.

Operational data is currently available to provide data for each HD Application.

EPA standards year over year improve the ICE technology in order to create more energy efficient performance in the ICE technology which increases the MPG, range, durability and reliability of all Classes of vehicles.

In order to continue to advance the EV technologies there should be standards for the EV energy efficiency or a price signal in the translation of LCFS credits that establishes a benefit for the most energy efficient EV's.

Currently the LCFS EER program is providing a credit based on Table 5. (below on next page).

Under Code 17 CCR § 95481, the Definitions and Acronyms for the Energy Economy Ratio (EER) and Heavy-Duty Vehicles (HDV or HD) are the following.

(51) "Energy Economy Ratio (EER)": The dimensionless value that represents the efficiency of a fuel as used in a powertrain as compared to a reference fuel used in the same powertrain. EERs are often a comparison of miles per gasoline gallon equivalent (mpge) between two fuels. EERs for fixed guideway systems are based on MJ/number of passenger-miles.

(75) "Heavy-Duty Vehicle": A vehicle that is rated at or greater than 14,001 pounds gross vehicle weight rating (GVWR).

APPENDIX A

Table 5. EER Values for Fuels Used in Light- and Medium-Duty, and Heavy-Duty Applications.

Light/Medium-Duty Applications (Fuels used as gasoline replacement)		*Heavy-Duty/Off-Road Applications (Fuels used as diesel replacement)*		*Aviation Applications (Fuels used as jet fuel replacement)*	
Fuel/Vehicle Combination	*EER Values Relative to Gasoline*	*Fuel/Vehicle Combination*	*EER Values Relative to Diesel*	*Fuel/Vehicle Combination*	*EER Values Relative to Conven-tional Jet*
Gasoline (incl. E6 and E10) Or E85 (and other ethanol blends)	1	Diesel fuel Or Biomass-based diesel blends	1	Alternative Jet Fuel	1
CNG/ICEV	1	CNG or LNG (Spark-Ignition Engines)	0.9		
		CNG or LNG (Compression-Ignition Engines)	1		
Electricity/BEV, or PHEV	3.4	Electricity/BEV or PHEV* Truck or Bus	5.0		
		Electricity/Fixed Guideway, Heavy Rail	4.6		
		Electricity/Fixed Guideway, Light Rail	3.3		
On-Road Electric Motorcycle	4.4	Electricity/Trolley Bus, Cable Car, Street Car	3.1		
		Electricity Forklifts	3.8		
		eTRU	3.4		
		eCHE	2.7		
		eOGV	2.6		

`

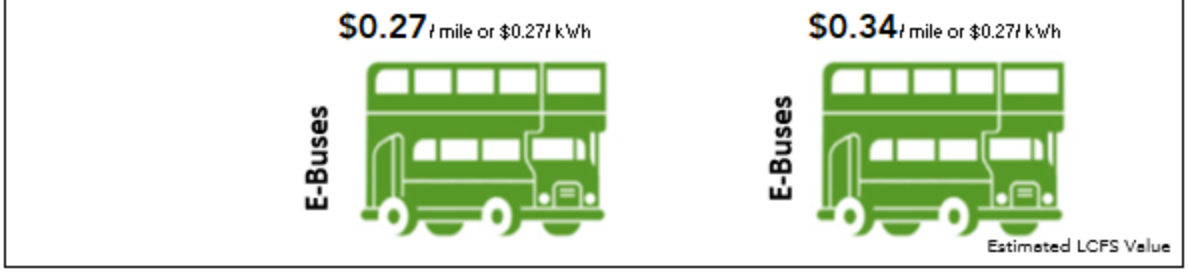
Issue

The EER comparison to a gasoline or diesel powertrain in the current calculation is penalizing the most and best efficient HD EV vehicle technologies. These are the technologies advancing further reductions in greenhouse gas emissions. Translating the value of credits generated should be established by the actual operational performance and efficiency when comparing HD classes of EV vehicles that produce different efficiencies. Comparing the EV vehicle range including kWh battery pack size and fuel consumption of traveling one EV mile (kWh/mile) should establish more LCFS credits when the HD EV vehicle consumes less kWh/mile (especially when the battery kWh capacity is more) verses another vehicle that consumes more fuel and results in higher kWh/mile plus it has a smaller battery kWh capacity. The vehicles that consume more kWh/mile and offer less capacity and EV range of miles do not achieve an energy efficiency rating over other better performing technologies that are commercially available. There are HD EV vehicles that are readily and commercially available that achieve these higher standards; however, they currently benefit LESS than the others that do not achieve the same; furthermore, this will negatively impact our air quality due to the exchange when charging on the grid.

The below table illustrates two HD EV's with different efficiencies. Both vehicles obtain $0.27 per kWh; however, the less efficient EV vehicle generates more revenue per mile resulting in a more positive LCFS value impact even though the vehicle is less energy efficient.

`

Fuel Revenue Credits Per Mile. HDV.		
	EV Per Mile Revenue	
Credit Price	HD (Class 4-5) = 5.0 EER	HD (Class 4-5) = 5.0 EER
$/Credit	kWh/Mile	kWh/Mile
Value	1	1.25
$100	$0.14	$0.17
$160	$0.22	$0.27
** $200	$0.27	$0.34



Benefits

The best performing EV technologies provide us with an opportunity to strengthen our EV standards the same as EPA has for other technologies. This can align with CARB's desire to influence confidence to fleet and stakeholders regarding the future of the EV technology (ZEV Powertrain certification). The requirement to accelerate EV adoption should achieve deployment of energy efficiency in the most cost-effective technology. Economic benefits can be achieved for society when EV adoption is accelerated. Standardizing the most cost-effective, energy efficient market-ready technologies sends the right signal that EV's are the highest energy saving vehicles, and will minimize cost on the grid and stakeholders.

Not only does energy efficiency represent the lowest-cost energy supply resource, but it also offers benefits including economic development, overall load reduction on the grid, quality improvements in the EV technology, and net savings to both stakeholders and public health.

`

2. Transparency of LCFS Credit Program Values

Small Commercial Customers and business will be the largest adopters of MHD commercial EV's. These are the entities that are not fairly being educated on the LCFS programs and could easily be taken advantage of. The programs have been developed to ensure fleet benefits, incent adoption of the technology and achieve fuel switching benefits. There should be disclosure requirements and extra effort to ensure fairness for small commercial customer education, this specifically includes the value of the credits and the hierarchy credit generator related to charger ownership.

Conclusion

Thank you for this opportunity.

Sincerely,

Lisa McGhee