

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.

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

Deliveries: GreenPower has delivered **ninety-seven (97)¹** 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.

Introduction:

GreenPower Motor Company (GP) 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 as well as others.

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, durability, 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 the systems in our electric buses use reliable and use 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.

¹ HVIP Mapping tools effective 11-30-20. GP has delivered 97 EV MHD to date, the second behind BYD.

GreenPower's electric buses will exceed any environmental compliance standards and safety regulations.

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

Background:

The purpose of the program is to support the investment by reducing the incremental cost and for the fleet to have a benefit when driving the technology. Societal benefits are achieved from better air quality. Higher performing and reliable vehicles by OEM's that are trusted--- is a key purpose for the ZEV PT Cert which begins 2021 and was adopted June 2019 anonymously by this Board. There should be alignment to support higher standards by OEMs that support these higher standards, fleets have expressed, and you listened when developing the ZEV PT certification --- fleets expect durability, reliability, and efficiency in their commercial vehicles.

- I) Regulations exist and fleets are dependent on vehicle funding to support the acceleration of the MHD sector to Electrify all Fleet Vehicles beginning at Class 2 to Class 8 Commercial Trucks and Buses.**

A) Governor Gavin Newsom on 9-23-20

Announced that he will aggressively move the state further away from its reliance on climate change-causing fossil fuels while retaining and creating jobs and spurring economic growth – he issued an executive order requiring sales of all new passenger vehicles to be zero-emission by 2035 and additional measures to eliminate harmful emissions from the transportation sector. It shall be a further goal of the State that 100 percent of medium- and heavy-duty vehicles in the State be zero-emission by 2045 for all operations where feasible and by 2035 for drayage trucks.²

B) The ZEV Power Train Certification (ZEVPC) Resolution 19-15³

In the findings from the ZEV PT certification towards its Resolution, CARB Staff states that they believe the vehicles that would be targeted by these measures operate in applications that are well-suited, both technically and economically, for the first launch of zero-emission technologies in the heavy-duty sector. In fact, the proposal for the Innovative Clean Transit Regulation was presented at the Board's September 2018 hearing and the proposal for the Zero-Emission Airport

² <https://www.gov.ca.gov/wp-content/uploads/2020/09/9.23.20-EO-N-79-20-text.pdf>

³ <https://ww3.arb.ca.gov/regact/2019/zepcert/res19-15.pdf> (June 27, 2019)
<https://ww3.arb.ca.gov/regact/2019/zepcert/uid.pdf>

Shuttle Regulation was considered at the same February 2019 and June 2019 hearings as this regulatory action. ***That said, the heavy-duty zero-emission industry is still relatively new and thus is subject to many of the issues associated with any emerging market. For example, there is still substantial variability in vehicle quality and support; purchasers are still relatively unfamiliar with zero-emission technology and its operational impacts; and there is limited historical information available by which to judge manufacturers. Given time, staff believes the market could eventually resolve these issues on its own. However, considering California's near-term zero-emission goals, it is necessary to take actions today to help stabilize the industry as the state begins to roll out its suite of heavy-duty zero-emission measures.*** In order to provide this needed support, the regulatory action builds upon existing certification requirements set forth in California's Heavy-Duty Phase 2 Greenhouse Gas Standards (Phase 2)⁸ for on-road heavy-duty electric and fuel-cell vehicles and establishes an alternative certification procedure that helps ensure such vehicles are well-supported once deployed and consistent and reliable information is available to fleets when making purchase decisions. In addition, the regulatory action establishes new standards with certification requirements for zero-emission powertrains installed in heavy-duty electric and fuel-cell vehicles that certify to the alternative procedure. Specifically, the Zero-Emission Powertrain Certification Regulation (ZEP Cert)

APPENDIX E OF THE REGULATION STATES THE PURPOSE AND RATIONALE FOR EACH REGULATORY PROVISION

The sections below highlight this purpose to ensure fleets have product that is reliable and safe in the Nascent MHD sector as there have been failures that can be avoided by the development and implementation of improvement in the technology.

Section 3.1.3 of the California Provisions Purpose:

The section is being added to the California Provisions to require manufacturers to make accessible on the vehicle information about the vehicle's energy efficiency. Rationale: ***This requirement would allow fleets to compare the efficiency of different vehicle models and different vehicle operators⁴***, which will facilitate fleet efforts to purchase the most-efficient vehicles and to maximize operator efficiency.

Section 3.1.8 of the California Provisions

Purpose: The section is being added to the California Provisions to require manufacturers to provide an attestation that the powertrain to be installed in the vehicle conforms to the design tolerances and performance specifications of all vehicle integration components. Rationale: Many heavy-duty battery-electric or fuel-cell vehicles sold to date were built by integrating an electrified powertrain into an existing vehicle driveline. ***Information staff gathered during the regulatory development process suggests that this build process has resulted in vehicle reliability issues⁵***. This requirement is necessary because it would help ensure, especially in these cases, that manufacturers adequately assess the suitability of existing vehicle components before integrating a zero-emission powertrain.

⁴ Emphasis added by GP

⁵ Emphasis added by GP

Chapter 1. Motor Vehicle Pollution Control Devices

§ 1956.8. Exhaust Emissions Standards and Test Procedures -1985 and Subsequent Model Heavy-Duty Engines and Vehicles, 13 CA ADC § 1956.8 ⁶

(B) Phase-in Options.

(8) Zero-Emission Powertrain Certification Standards. Model Year (MY) 2021 and subsequent MY all-electric and hydrogen fuel-cell powertrains used in heavy-duty vehicles (over 14,000 pounds gross vehicle weight rating) and incomplete medium-duty vehicles (from 8,501 through 14,000 pounds gross vehicle weight rating) may be certified in accordance with the “California Standards

and Test Procedures for New 2021 and Subsequent Model Heavy-Duty Zero-Emission Powertrains,” as adopted June 27, 2019, which is hereby incorporated by reference herein. Powertrains certified using these procedures shall be deemed to have exhaust emissions of zero for any criteria pollutant or greenhouse gas.

(i) Definitions Specific to this Section. The following definitions apply to this section 1956.8.

(12) “Zero-emission powertrain” means an all-electric or hydrogen fuel-cell powertrain assembly, which includes (if applicable) the electric traction motor, system controller, generator, on-board charger, battery management system, thermal management systems, energy storage system (batteries, capacitors, and flywheels), inverter, fuel-cell stack, and the interface at which electrical power is converted to tractive mechanical power or vice-versa (in the case of a regenerative braking system), certified pursuant to the requirements in subsection (a)(8).

C) Fleet Vocations facing ZEV regulations

Subarticle 14. Zero-Emission Airport Shuttle Regulation, Resolution 19-16 ⁷

Article 4.3. Innovative Clean Transit⁸

Advanced Clean Truck Regulation , Resolution 20-19⁹

Title 40 - Protection of Environment, CHAPTER I - ENVIRONMENTAL PROTECTION AGENCY, SUBCHAPTER U - AIR POLLUTION CONTROLS, PART 1037 - CONTROL OF EMISSIONS FROM NEW HEAVY-DUTY MOTOR VEHICLES

Subpart I - Definitions and Other Reference Information

⁶[https://govt.westlaw.com/calregs/Document/I6D9662602DDD11E197D9B83B68A61150?viewType=FullText&originationContext=documenttoc&transitionType=StatuteNavigator&contextData=\(sc.Default\)](https://govt.westlaw.com/calregs/Document/I6D9662602DDD11E197D9B83B68A61150?viewType=FullText&originationContext=documenttoc&transitionType=StatuteNavigator&contextData=(sc.Default))

⁷ <https://ww3.arb.ca.gov/regact/2019/asb/res1916.pdf>

⁸[https://govt.westlaw.com/calregs/Browse/Home/California/CaliforniaCodeofRegulations?guid=IB28B357F6D914C079B5491D46E5D1F7E&originationContext=documenttoc&transitionType=Default&contextData=\(sc.Default\)](https://govt.westlaw.com/calregs/Browse/Home/California/CaliforniaCodeofRegulations?guid=IB28B357F6D914C079B5491D46E5D1F7E&originationContext=documenttoc&transitionType=Default&contextData=(sc.Default))

⁹ <https://ww3.arb.ca.gov/regact/2019/act2019/finalres20-19.pdf>

1. § 1037.801 Definitions¹⁰

Good engineering judgment has the meaning given in [40 CFR 1068.30](#). See [40 CFR 1068.5](#) for the administrative process we use to evaluate [good engineering judgment](#).

Greenhouse gas Emissions Model (GEM) means the [GEM](#) simulation tool described in [§ 1037.520](#) (incorporated by reference in [§ 1037.810](#)). Note that an updated version of [GEM](#) applies starting in [model year](#) 2021.

Gross vehicle weight rating (GVWR) means the value specified by the [vehicle manufacturer](#) as the maximum design loaded weight of a single [vehicle](#), consistent with [good engineering judgment](#).

II) Covid-19 Impact on Transportation Industry

California industry un-employment rate, Year Over Year differences as of August 2020¹¹:

Due to the recent change in the economy the Labor force decline has substantially impacted **Transportation** which further supports a reasonableness for support of funding. As of Aug. 2020, San Diego's unemployment rate is 9.9% and Imperial County (bordering neighbor) is 22.9%, the highest in the State. 2nd is Los Angeles at 16.6%.

California Transportation industry employment, Year Over Year differences as of August 2020:

Motor Vehicle Manufacturing -48%, Auto Rental -22%, Trucking -9.75%, Auto Dealer -12.5% & other -16%, Gasoline Stations -9.9%, Hospitality -32%. For **Resource** see: State of California, EDD Labor Force and Unemployment Interactive Map shown at footnote 11.

III) HVIP OEM's as per Mapping tools year over year¹²

Quality, Reliability and Efficiency Standards should be supported in the Funding Tables. GP recommends the following modifications. These suggested modifications are driven and supported by the above and the HVIP funding redeemed and non-paid vouchers found in the Attachment. The Lessons learned are critical to ensuring fleets achieve benefits in this technology and will establish higher standards by the OEM's to integrate with quality & performance.

¹⁰ <https://www.law.cornell.edu/cfr/text/40/1037.801>

¹¹ <https://www.labormarketinfo.edd.ca.gov/data/interactive-labor-market-data-tools.html>

¹² See HVIP Attachment Table downloaded from the Raw Data on 11-29-20. This table was created to obtain a snapshot of the results at the given time period and was compared to two past periods under the same method.

IV) Recommended Modifications to the Funding Table and HVIP by GP

1. Plus-up option for durability testing such as Altoona. This is the gold standard in reliability and durability testing of Federal Transit buses and can cost upwards of over \$500k to complete the testing.
2. Higher Funding Table for OEM's testing and certifying to resolution 19-15 the ZEV Powertrain Cert. This board has adopted the ZEV PT Cert. with an intention to ensure fleet confidence in the technology and to provide more incentives to OEM's that test to these higher standards. Higher performing standards will benefit stakeholders and resolve the technology failures that the Staff found that was repeating in the industry. Another aim of the ZEV PT Certification is to create remedies while also capturing more data about the technology and establishing quality EV's.
3. Correct the Tables and consider the vehicles by Class and Efficiency not just weight or size. Compare vehicles in Classification by Curb Weight & kWh battery capacity size to the results of the EV Efficiency & Range. This determines reduced GHG on the grid, and a benchmark for kWh/mile for the EV efficiency by Class. Find the book-ends for each Class and create an incentive for the most efficient to the ratio of the kWh capacity. This will establish a benchmark for the technology. Highly efficient technology should be incented over building larger and heavier vehicles that do not achieve a good economy for its Classification and Application. Without setting a standard for efficiency--- EV vehicles may not be developed with the same benefits as other OEM's have accomplished. This could result in a higher cost per mile to operate an EV by one OEM over other like Families of Vehicles. EV technology should aim to achieve EV efficiency standards the same as the SAFER or CAFE economy standards has historically achieved.
4. Create a higher incentive CAP for ZEV OEM's that demonstrate high deliverable volumes in the program (GP is #2 behind BYD). For example, there have been issues: The HVIP program in Jan 2020 had \$363 million dollars between the paid and non-paid EV MHD vouchers and currently that number is at \$255 million. (\$133 million is from 1,260 EV MHD delivered vehicles and the rest is non-paid). However, In 2019, HVIP had \$96 million dollars to one OEM - Chanje, which now only has \$2.2 million and all its 1,100 vouchers have disappeared. This OEM only delivered 25 vehicles.
5. Plus-up on Advanced charging integration such as Wireless (inductive). Wireless is a Contactless, supports Covid-19, takes up less real estate, has fewer moving parts to maintain or replace, it eliminates driver errors & training verses having to plug-in. This advances MHD further and the same as laptop and smart phones have established with wireless technology.
6. Higher Funding Table for small business and minority business' facing ZEV mandated regulation by a vocation (Transit, Airport Shuttle, Drayage). COVID-19 has a big impact on small business. This will reflect equity and diversity. The recommendation of the enhanced tables is similar as to what has been done for Schools.

V) Conclusion

The funding tables should reward OEM's that meet higher standards. These higher standards will achieve the results that the ZEP PT Certification intends to establish. GP recommends the above modifications to help establish more safety and standards ensuring fleet confidence in the technology.

Thank you for this opportunity.

Sincerely,

Lisa McGhee

Appendix:

HVIP Mapping Tools as of 11-30-2020

Date: 11-29-20				Color Codes: Red Text = Extinct OEM or No Longer listed in HVIP				Yellow Highlights = Alerts & Notes				Mapping Tools Raw Data for EV downloaded 11-29-20															
STATUS ON HVIP		11-29-20		ZEV OEM SALES:		PAID 11-29-20		FUNDING:		NON PAID 11-29-20		FUNDING:		CURRENT RESULTS TOTAL 11-29-20		RESULTS FUNDING %:		Results (increase or decreased amount) compared to Last 1-21-20 10 months		Past Results TOTAL 4-13-20 7 months		Results (increase or decreased amount) compared to Last 4-13-20 7 months		ZEV OEM:		Notes 11-29-20	
Not on HVIP	1 Altec	0	0.00%	\$0	0	0.00%	\$0	0	0.00%	0	0.00%	\$0	0.00%	1	-1	0	0	Altec							OEM per Website only has Hybrid Product available.		
	2 Blue Bird	62	4.59%	\$13,175,000	25	2.54%	\$5,500,000	87	3.72%	69	18	\$18,675,000	7.32%	298	254	590	-38	Blue Bird									
	3 BYD Motors	200	14.79%	\$26,237,852	352	35.77%	\$52,490,843	552	23.63%	298	254	\$78,728,695	30.88%	590	590	590	-38	BYD Motors									
	Extinct 4 Chanje (Started 4-2018)	25	1.85%	\$2,240,000	0	0.00%	\$0	25	1.07%	1,001	-976	1,078	-1,053	Chanje (Started 4-2018)													Total is now 552. In April Tot. vouchers were 590, then in June total was 362.
	5 Complete Coach Works	3	0.22%	\$277,500	0	0.00%	\$0	3	0.13%	3	0	\$277,500	0.11%	3	0	3	0	Complete Coach Works									Total is now 25. In April Tot. vouchers were 1,078 and in June total was to 925.
	6 Eldorado National	5	0.37%	\$1,500,000	0	0.00%	\$0	5	0.21%	5	0	\$1,500,000	0.59%	5	0	5	0	Eldorado National									
	Envirotech Drive Systems (new OEM)	0	0.00%	\$0	0	0.00%	\$0	0	0.00%	0	0	\$0	0.00%	0	0	0	0	Envirotech Drive Systems									
	Extinct 7 EVI	112	8.28%	\$5,140,000	0	0.00%	\$0	112	4.79%	112	0	112	0	EVI													
N/A	8 EVSE Voucher	74	5.47%	\$2,320,785	0	0.00%	\$0	74	3.17%	286	-212	56	18	EVSE Voucher													See "other" below. This is new category as of Jan 2020
Extinct	9 Ford	51	3.77%	\$653,000	0	0.00%	\$0	51	2.18%	51	0	\$653,000	0.26%	51	0	51	0	Ford									
	Freightliner (new OEM)	0	0.00%	\$0	0	0.00%	\$0	0	0.00%	0	0	\$0	0.00%	0	0	0	0	Freightliner									
	10 Gillig	1	0.07%	\$150,000	0	0.00%	\$0	1	0.04%	1	0	\$150,000	0.06%	1	0	1	0	Gillig									
	11 Green Power	93	6.88%	\$9,725,000	36	3.66%	\$4,005,000	129	5.52%	128	1	\$13,730,000	5.39%	129	0	129	0	Green Power									
Not on HVIP	12 Kalmar Ottawa	41	3.03%	\$6,300,000	1	0.10%	\$150,000	42	1.80%	53	-11	53	-11	Kalmar Ottawa													No Listing any longer on HVIP
	NEW Kenworth (NEW)			0.00%		0.00%			0.00%			0.00%															
	13 Lightning Systems	34	2.51%	\$2,480,000	124	12.60%	\$11,610,000	158	6.76%	24	134	\$14,090,000	5.53%	158	0	158	0	Lightning Systems									
	14 Lion Bus	42	3.11%	\$8,825,000	79	8.03%	\$15,420,000	121	5.18%	57	64	\$24,245,000	9.51%	63	58	63	58	Lion Bus									
	15 Micro Bird	5	0.37%	\$450,000	3	0.30%	\$280,000	8	0.34%	11	-3	\$730,000	0.29%	11	-3	13	-5	Micro Bird									
	16 Motiv Powers	40	2.96%	\$4,067,350	27	2.74%	\$2,450,000	67	2.87%	34	33	\$6,517,350	2.56%	73	-6	73	-6	Motiv Powers									
	Extinct 17 Navistar	34	2.51%	\$715,000	0	0.00%	\$0	34	1.46%	34	0	34	0	Navistar													
	18 New Flyer	30	2.22%	\$4,852,000	29	2.95%	\$5,075,000	59	2.53%	57	2	\$9,927,000	3.89%	57	2	59	0	New Flyer									
Not on HVIP	19 Orange EV	81	5.99%	\$13,595,850	5	0.51%	\$810,000	86	3.68%	128	-42	108	-22	Orange EV													No Listing any longer on HVIP
	N/A 20 Other "EVSE" (another EVSE category)	18	1.33%	\$1,127,207	190	19.31%	\$9,431,434	208	8.90%	0	208	270	-62	Other "EVSE" (another EVSE category)													
	NEW Peterbilt (NEW)			0.00%		0.00%			0.00%			0.00%															
	21 Phoenix MotorCars	81	5.99%	\$6,980,000	19	1.93%	\$1,592,445	100	4.28%	90	10	\$8,572,445	3.36%	101	-1	101	-1	Phoenix MotorCars									
	22 Proterra	81	5.99%	\$11,340,000	47	4.78%	\$6,745,000	128	5.48%	128	0	\$18,085,000	7.09%	128	0	128	0	Proterra									
	NEW Roush Cleantech (NEW)			0.00%		0.00%			0.00%			0.00%															
	23 Sea Electric (Q1 2020 on HVIP)	1	0.07%	\$90,000	10	1.02%	\$900,000	11	0.47%	0	11	\$990,000	0.39%	11	0	11	0	Sea Electric									
	N/A 24 School Bus Placeholder	0	0.00%	\$0	0	0.00%	\$0	0	0.00%	11	-11	11	-11	School Bus Placeholder													All Vouchers are now gone and do not exist??
	25 Smith Electric	168	12.43%	\$6,290,000	0	0.00%	\$0	168	7.19%	168	0	\$6,290,000	2.47%	168	0	168	0	Smith Electric									
	26 Thomas Built	0	0.00%	\$0	15	1.52%	\$3,435,000	15	0.64%	16	-1	\$3,435,000	1.35%	16	-1	29	-14	Thomas Built									
	?? 27 Workhorse / AMP Electric	1	0.07%	\$80,000	0	0.00%	\$0	1	0.04%	1	0	\$80,000	0.03%	1	0	1	0	Workhorse AMP Electric (new)									
	28 Xos / Thor	3	0.22%	\$250,000	22	2.24%	\$2,200,000	25	1.07%	11	14	\$2,450,000	0.96%	11	14	33	-8	Xos									
Extinct	29 Zenith Motors	66	4.88%	\$4,010,000	0	0.00%	\$0	66	2.83%	66	0	\$4,010,000	1.57%	66	0	66	0	Zenith Motors									Extinct OEM as of 2020
	Total ZEV Sales / Paid	1,352	100.00%	\$132,871,544	984	100.00%	\$122,094,722	2,336	100.00%	2,844	-508	3,493	-1,157														There is a Total of 1,237 Vehicle Vouchers
	Total Extinct OEM or EVSE Sales	579	42.83%																								that have fallen OUT of the program since 4-13-20 (among 11 various OEM's)
	Total ZEV OEM Vehicle Sales (active)	773	57.17%																								There has been a total of 444 vouchers redeemed (paid) in 2020 (55 are EVSE's)
		Total 1-21-20 Redeemed / Paid	908																								
		10 mo. Growth, Redeemed / Paid	444																								