January 30, 2016

Samuel Wade, Branch Chief, Transportation Fuels
Air Resources Board
1001 I Street
Sacramento, CA 95814

(Comment submitted via email to LCFSWorkshop@arb.ca.gov)

RE: Proposal to Enable LCFS Credit Generation from Renewable Power

Dear Mr. Wade:

DriveGreen LLC ("DriveGreen") appreciates the opportunity to provide comments regarding the draft Low Carbon Fuel Standard ("LCFS") regulations developed by the Air Resources Board ("ARB"), pertaining to electric vehicle ("EV") credit generation, monitoring, verification and other issues ("Draft LCFS Regulation"). Consistent with our prior discussions, this comment describes the nature and mechanics of our proposal that ARB achieve substantially more greenhouse gas ("GHG") reductions by enabling LCFS credit generation from very low carbon intensity power contractually supplied to EV's. (the "Proposal")

DriveGreen

DriveGreen is a Portland, Maine based company that is a pioneer in enabling the use of very low carbon intensity ("CI") fuels in transportation. DriveGreen has utilized a fuel pathway for biomethane fleets to generate cellulosic (D3) Renewable Identification Numbers ("RINs") under the federal Renewable Fuel Standard ("RFS"). In 2014, EPA accepted DriveGreen's petition for qualifying electricity derived from renewable biomass when used for EV's. That pathway is currently proposed for implementation by the Agency pursuant to the Renewables Enhancement and Growth Support Rule, published in the Federal Register on November 16, 2016.[1]

[1] 81 Fed.Reg. 8028 (November 16, 2016), EPA-HQ-OAR-2016-0041, https://www.federalregister.gov/d/2016-25292

Overall, DriveGreen is highly supportive of the LCFS program. The LCFS and RFS have proven to be effective market-based programs that have driven the rapid development and expanded supply of low carbon fuels in the US and California.

Objective

The objective of this Proposal is to substantially reduce the GHG emissions caused by EV power demand by incentivizing the supply of very low CI power to EV's.

Nature of Proposal

The Proposal would enable the generation of LCFS credits based on the use of very low CI power in EV's. The Proposal would impose a qualification standard of a minimum CI reduction of 60% compared to the current CI of California Grid Mix Electricity. The proposed "very low CI" standard for power is consistent with the GHG reduction standard for very low carbon liquid and gaseous transportation fuels established by California Health and Safety Code §43870(b):

> *(b) As used in this section, "very low carbon transportation fuel" means a liquid or gaseous transportation fuel having no greater than 40 percent of the carbon intensity of the closest comparable petroleum fuel for that year, as measured by the methodology in the low-carbon fuel standard regulation (Subarticle 7 (commencing with Section 95480) of Article 4 of Subchapter 10 of Chapter 1 of Division 3 of Title 17 of the California Code of Regulations). The carbon intensity for the transportation fuel shall include the indirect land use change emission if an agricultural commodity that is a food product is used as a feedstock for the production of the transportation fuel.*

This standard would ensure that only power sources providing substantial CI reductions would qualify to generate LCFS credits. To ensure additionality and avoid any significant impact on the State's renewable power markets, RECs being used to meet California's Renewable Portfolio Standard would be ineligible to generate LCFS credits. Only additional renewable power placed on the California grid and verified as used in qualifying EV's could serve as the basis for LCFS credits. The additional supply of very low CI power to EV's would decrease the amount of GHG's emitted to supply power to EV's and correspondingly would increase the number of LCFS credits generated as measured in metric tons ("MT").

DriveGreen

Specific Aspects of Proposal

The Proposal would enable additional GHG reduction in the most important EV category: EV charging that occurs in single or multi-family residences ("Residential"). As the LCFS regulation currently provides, the Electrical Distribution Utility (the "Utility") would retain all rights to generate LCFS credits based on the CI of California Grid Mix Electricity in the Residential sector. Thus the Utility's LCFS credit generation for its residential EV customers would not be diminished. However, LCFS credits could be generated for the additional GHG reductions that result from additional very low CI power. The Electric Vehicle Service Provider ("EVSP") would be responsible for aggregating residential customers, sourcing the environmental attributes of the very low CI power, and for monitoring and verifying the amount of very low CI power utilized by the individual EV's.

In order to ensure program integrity, the Proposal is crafted so that:

- The existing system of LCFS credit generation by Utilities and EV rebate programs would not be altered or disrupted;
- Only additional very low CI power sold for use as transportation fuel and no other purpose would be eligible to generate LCFS credits;
- The existing system for monitoring and verifying renewable power delivered to the grid would be utilized to maximize administrative efficiency and to preclude the double use of renewable energy credits ("RECs").

This Proposal leverages the robust system that has been developed to support California's Renewable Portfolio Standard ("RPS"), and a host of other programs that promote renewable energy and GHG reduction. This system is administered by the Western Renewable Energy Generation Information System ("WREGIS") and was developed to ensure that the environmental attributes of renewable power delivered to the grid can be precisely quantified and utilized to achieve policy goals. In tandem with this Proposal, we have developed a Generating, Monitoring and Verifying Proposal ("M&V Proposal") that is attached as **Exhibit A**. The M&V Proposal describes the existing WREGIS program, how RECs are used for compliance with California's RPS, and how additional very low CI power could be used to generate LCFS credits.

The M&V Proposal illustrates that RECs provide a powerful and readily available tool for that can readily be applied to LCFS credit generation. As noted by the Center for Resource Solutions in a comment to ARB to this rule making:

> ***"RECs are the standard accepted proof that 1 MWh of renewable electricity was generated and used.*** *They are the most precise means of tracking renewable electricity and therefore the most appropriate tool to verify that renewable electricity is being used by an LCFS credit generator. RECs are recognized by actors in the voluntary market and all thirty-five (35) states that require or have a goal to deliver renewable generation to users, including California, as the common instrument used to demonstrate renewable energy usage."*[2]

Interaction with Existing Renewable Energy Programs

Because the LCFS program authorizes LCFS credit generation based on EV power usage, LCFS policy design issues pertaining to EV's necessarily intersect with state energy sector policies. California is a national leader in both renewable energy policies such as the RPS, and transportation policies including the LCFS. In order to ensure these policy sectors are harmonized, this Proposal has been designed with the following components:

- RECs would be required to meet Category I REC requirements to be eligible to serve as the basis for LCFS credits;[3]
- Only additional very low CI power sold for use as transportation fuel and no other purpose would be eligible to generate LCFS credits;
- Through the WREGIS system, RECs would be retired for all purposes when used as the basis for LCFS credits;
- LCFS credit generators would remain eligible to generate federal RFS credits, known as Renewable Identification Numbers or RINs;
- Power generating facilities with existing RPS contracts to supply renewable power and RECs to utilities, including contracts awarded pursuant to the Public Utility Regulatory Policies Act (PURPA) of 1978, would remain bound by the terms of those contracts; and,
- A power generating facility with an existing PURPA contract for a quantity of power less than the facility's total capacity would be ineligible to receive PURPA rates for any power supplied to the grid for LCFS credit generation purposes.

[2] Maya Kelty, Comments of Center for Resource Solutions, January 6, 2017, at p.2, https://www.arb.ca.gov/fuels/lcfs/workshops/feedback.htm#12192016 (Comments RE: Working Meeting December 2, 2016) (emphasis in original).

[3] Category 1 requires: "Have a first point of interconnection with a California balancing authority, have a first point of interconnection with distribution facilities used to serve end users within a California balancing authority area, or are scheduled from the eligible renewable energy resource into a California balancing authority without substituting electricity from another source. (…) Calif. Pub. Util. Code § Section 399.16(b)(1)(A).

Providing Beneficial Impacts to the Electrical Grid

One issue of concern that has been raised regarding LCFS credit generation from very low CI power is the risk of potentially adverse impacts to the electrical grid. This policy concern is reflected by the existing LCFS regulation pertaining to residential charging of EV's which provides that Utilities must: "Provide rate options that encourage off-peak charging and minimize adverse impacts to the electrical grid;…"[4]

We are mindful of this concern and are confident that a vehicle grid integration (VGI) component can be developed to ensure that adverse impacts are avoided and beneficial impacts achieved. We look forward to a dialogue with ARB to determine the optimal approach. At this stage, we would note two significant opportunities to develop a sound policy structure in this regard:

1. Multiple California agencies are actively working together to develop strategies to minimize adverse grid impacts from EV charging and instead to achieve beneficial grid impacts.[5]
2. The RFS provision for electricity provides that RINs may only be generated if: "The quantity of electricity for which RINs were generated was sold for use as a transportation fuel and for no other purpose."[6] A similar LCFS provision could link the timing of the supply of very low CI power to the grid with the use of power by EV's.

Substantial GHG Reductions

Through various policy mechanisms, California has embarked on an aggressive program to electrify its transportation sector, particularly the light-duty vehicle market. This Proposal has the potential to reduce greenhouse gas emissions in the long-term by leveraging not just the efficiency of the EV vehicle itself but also by providing the efficient EV with very low CI electricity. The implications are best illustrated by examining ARB's long-term planning for GHG reductions, as described in the draft 2030 Target Scoping Plan ("Scoping Plan").

[4] 17 CCR §95483(e)(1)(C).
[5] See e.g. California Energy Commission, Third Annual California Multi-Agency Update on Vehicle-Grid Integration Research, a public workshop to review the progress of research called for in the California Vehicle-Grid Integration Roadmap as part of the Governor's Zero- Emission Vehicle Action Plan (December 12, 2016), at http://www.energy.ca.gov/calendar/index.php?eID=2811
[6] 40 C.F.R. §80.1426(f)(11)(i)(C).

Alternative 2 of the Scoping Plan, known as the Clean Fuels and Technology Scenario, projects 4.2 million Zero Emission Vehicles (ZEV's) in California in 2030. Using ARB's current EV assumptions of 12,000 mi/year and 3.5 mi/kWh and assuming that all ZEV's are Battery Electric Vehicles (BEV's), these 4.2 million BEV's will consume approximately 14.4 million MWh of power in 2030. If just 50% of this light-duty BEV power demand is supplied by very low-CI power generators, this would result in emission savings of 8.1 million tonnes CO_2e in 2030 as summarized by Table 1.[7]

Table 1. Projected ZEV Electricity Demand and Emission Savings in 2030 from Very-Low CI Power

Electricity Category	Electricity (MWh)	Emission Savings (tonne CO_2e)
California Grid Mix	7,200,000	
Biomass Electricity (20 g CO_2e/MJ)	3,600,000	3,927,761
Solar/Wind Electricity (0 g CO_2e/MJ)	3,600,000	4,186,961
2030 ZEV Total	**14,400,000**	**8,114,723**

Summary of Benefits

As is clearly indicated by the Scoping Plan based scenario analysis, the Proposal provides the opportunity for ARB to achieve more than a 50% additional GHG reduction benefit from the same number of EV vehicles simply by reducing the CI of the underlying transportation fuel, electricity. Using the Clean Fuels and Technology Scenario, this amounts to more than 8 MMT of GHG reduction in 2030. Eight million metric tons of GHG reduction exceeds by 50% the entire amount of GHG reduction that the LCFS achieved in 2015, the most recently fully reported LCFS compliance year.[8] This additional 8 MMT/year savings would be achieved through the market-based mechanism of the LCFS credit program and would not require additional expenditures by either the California Government or individual citizens.

[7] For modeling purposes, we assumed that 50% of the very low CI power would be supplied by existing biomass facilities utilizing urban waste, agricultural waste and forest residues from high hazard zone wildfire areas as feedstocks. The remaining 50% would be supplied by wind and solar electricity. Consistent with existing LCFS pathways, it was assumed that the biomass electricity would have CI values of 20 g CO_2e/MJ and the wind and solar electricty a CI of 0 g CO_2e/MJ.

[8] See Air Resources Board, Low Carbon Fuel Standard Dashboard, spreadsheet underlying Tab 3, Total Credits and Deficits for All Fuels Recorded and Cumulative Credit Bank Q1 2011- Q2 2016, (5.5 MMT credits in 2015) at https://www.arb.ca.gov/fuels/lcfs/dashboard/dashboard.htm

We would also note that adopting this Proposal would be consistent with 17 CCR§ 95496 (LCFS Regulation Review) which provides that, "The 2017 progress report shall include, at a minimum, consideration of the following areas: (…) (2) The availability and use of ultra-low carbon fuels to achieve the LCFS standards…"

Thank you for your consideration of our input. Please contact us if any further input would be helpful. We look forward to continuing to participate in this proceeding.

Sincerely,

Robert Cleaves