



April 23, 2018

Mary Nichols, Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Subject: Comments to the Proposed 2018 Amendments to the Low Carbon Fuel Standard

Chair Nichols and Members of the Air Resources Board:

I am writing on behalf of Tesla to provide recommendations to the California Air Resources Board (CARB) as a part of the stakeholder comment process for the 2018 Amendments to the Low Carbon Fuel Standard (LCFS). The LCFS regulation is an important tool to reduce carbon emissions in the state's transportation sector and to promote sustainable technology deployment. Within the LCFS, the electricity pathway has great potential to dramatically impact the adoption of Electric Vehicles (EVs) and encourage the use of solar energy. To realize this potential, we recommend CARB consider several modifications to the regulation in this rulemaking.

Tesla has five key recommendations for CARB to consider in this rulemaking:

1. Data-Backed Credit Generation: permit EV manufacturers to utilize fleet-wide, aggregated charging data from vehicle telematics to earn additional residential LCFS credits if real-world charging exceeds CARB's estimated charging for the manufacturer's fleet.
2. Use of Residential Charging Funds: allow EV manufacturers to opt in and earn base residential charging credits in lieu of utilities for their fleets, as automakers are best-positioned to utilize this value to administer consumer-facing incentives to accelerate zero-emission vehicle deployment in the state.
3. Renewable Energy Matching: approve staff's proposal, with modifications, to allow book-and-claim accounting for renewable electricity supplied as a transportation fuel and allow automakers to generate these credits by matching solar production data with fleet-wide, aggregated charging data from vehicle telematics.
4. Efficiency of Electric Trucks: approve staff's proposal to update the Energy Economy Ratio (EER) for heavy-duty EVs.
5. 2030 Target: approve staff's proposal to increase the statewide Carbon Intensity (CI) reduction target to 20% by 2030.

I. Permit EV manufacturers to utilize fleet-wide, aggregated charging data recorded by vehicle telematics to earn additional residential LCFS credits if real-world charging exceeds CARB's estimated charging for the manufacturer's fleet.

Traditional sources of measured charging data, such as smart chargers or separate household utility meters, capture a very small percentage of total charging sessions. As a result, CARB is relying on high-level estimates to calculate residential charging credit generation. In 2017, only 1% of the credits that utilities received was generated from data provided by

separate utility meters.¹ As EV volumes increase, this approach could lead to significant errors in the volume of credits distributed under this pathway.

We recommend that CARB utilize vehicle telematics data to accurately and comprehensively measure statewide EV charging. Vehicle manufacturers can accurately report the quantity of electricity consumed by their vehicles by aggregating data recorded and transmitted by on-board vehicle systems. The data captured includes the type of charging (alternating current or direct current), time, and quantity of electricity (in kWh). These systems are designed to be incredibly accurate given the critical nature of onboard current and voltage sensing for the safe and reliable operation of the charger and battery. In addition to automaker testing of the accuracy of this data, the Environmental Protection Agency (EPA) also tests and confirms the accuracy of this data as a part of its confirmatory testing procedures.

The ability to capture this data is commonplace within the auto industry. In addition to Tesla, we are aware of at least seven other vehicle manufacturers that have this capability, as indicated by their voluntary participation in programs such as the Open Vehicle Grid Integration Protocol.

To encourage EV manufacturers to provide this valuable data, CARB should, at a minimum, permit automakers to receive any additional credits resulting from the comparison of fleet-wide, aggregated vehicle charging with CARB's estimated charging data. For example, if CARB estimates that a given manufacturer's fleet generates 2 credits per vehicle per year, but the automaker's real-world charging data reveals that each vehicle should have generated 2.5 credits, the automaker should be receive the 0.5 credit difference. In the next section of our comments, we make the case for why automakers should receive the entire 2.5 credit allocation, as automakers are best-positioned to utilize the credit value to administer consumer-facing incentives that will increase EV sales in California.

As part of this update, CARB must clarify that vehicle telematics is an acceptable data source for LCFS credit generation. We propose the following modifications to the regulatory text:

1. Change "*metered* charging data" references to "*measured* charging data" throughout the regulation;
2. Add a definition for "measured charging data" that includes utility-metered data, Electric Vehicle Supply Equipment (EVSE) data and vehicle telematics data provided by automotive manufacturers;
3. Update reporting requirements for measured residential EV charging in Section 95491(d)(3)(B) of the regulation to include Vehicle Manufacturers; and
4. Add new language to confirm that automakers can generate additional residential EV charging credits if fleet-wide, aggregated charging data from telematics exceeds CARB's charging estimates.

As a part of these updates, Tesla encourages CARB to establish reporting requirements that are easy to administer for EV manufacturers and that ensure the data is sufficiently aggregated to protect consumer privacy.

In summary, vehicle telematics data is the most comprehensive and accurate charging data available for the statewide fleet of EV charging today, and the use of this data will increase

¹ Source: CARB reported data.

credit generation and improve the overall data integrity of the LCFS program. CARB should clearly define the role of vehicle telematics data for credit generation by modifying the definition of “metered charging data” to include this form of charging measurement and allow this data to be used to generate residential credits that are not currently captured through the estimation methodology.

II. Allow EV manufacturers to opt in and earn base residential EV charging credits in lieu of utilities for their fleets, as automakers are best-positioned to utilize this value to administer consumer-facing incentives to accelerate zero-emission vehicle deployment in the state.

There is broad recognition among stakeholders that the rebate programs currently administered by utilities must transition from a fragmented patchwork of post-sale incentives to a statewide, point-of-sale incentive to truly maximize the impact of funds generated under the residential charging pathway of the LCFS. Efficient use of these funds is incredibly important, as the total value generated under the residential pathway exceeded ~\$97 million in 2017, which is approaching the total value distributed to non-fuel cell EVs under California’s Clean Vehicle Rebate Project (CVRP) over the same period.² Automakers have deep experience administering incentive programs to their customers; and are best-positioned to manage a point-of-sale clean fuels incentive through their network of retail locations. We propose that CARB allow automakers to opt in to the residential charging pathway, provide fleet-wide, aggregated vehicle charging data as the basis for credit generation and deploy statewide point-of-sale incentive programs for their EV products.

Today, residential charging credits granted to utilities account for the vast majority of on-road electricity credit generation (~93% in 2017).³ Most of these credits, approximately 80%, are allocated to California’s three Investor-Owned Utilities (IOUs) participating in the LCFS.⁴ The remaining credits (~20%) are distributed across thirteen Publicly Owned Utilities (POUs). The result is a fragmented network of incentive offerings across the state, where the IOU rebates are the most critical given they receive the bulk of the EV credit value.

Utility LCFS incentive programs vary in terms of type (e.g. vehicle rebate, charger rebate, electric bill credit, discounted charging rates), amount (e.g. vehicle rebates range from \$200-\$599, charger rebates vary), eligibility criteria (e.g. anyone who has purchased an EV at any date, customers who purchased an EV in the last 6 months, commercial charger installer) and application process (e.g. one-time rebate check through an online or mail-in form, annual enrollment process for bill credit). Aside from the significant administrative cost required to maintain these programs⁵, consumers are rarely aware that these benefits exist when they are

² Source: CARB reported that ~779k LCFS credits were generated from on-road electricity use in 2017. This equates to ~\$97M based on \$125/credit. CVRP rebates of \$104M were issued to non-fuel cell EVs in 2017. <https://cleanvehiclerebate.org/eng/rebate-statistics>.

³ Source: CARB reported data. CARB reported that ~779k LCFS credits were generated from on-road electricity use and ~199k from off-road electricity use in 2017.

⁴ Source: CVRP reported data, which is used by CARB staff to determine the annual allocation of credits across utility service territories. The three IOUs participating are Pacific Gas & Electric, Southern California Edison and San Diego Gas & Electric.

⁵ The IOUs estimated \$6.4M of administrative expense to run their programs in the first two years (2017 and 2018).

making EV purchase decisions, and the programs are too fragmented and time-consuming to explain for automakers to confidently promote them at the point of sale.

We propose that CARB allow automakers to opt in to the residential EV charging pathway and utilize the funds to offer a funded, statewide point-of-sale incentive to their consumers. The point-of-sale approach to incentive design is broadly considered the most effective method of driving EV sales.⁶ Below is a summary of the key advantages of automaker-administered incentive programs versus the current utility-administered programs:

(See following page for table comparing incentive programs)

⁶ “Cash at the time of purchase is by far the best financial incentive – over twice the value of a tax credit.” *Evaluating Methods to Encourage Plug-in Electric Vehicle Adoption: A review of reports on PEV incentive effectiveness for California Utilities*, Plug In America for CalETC, p.13 (October 2016). “Of all the options for returning LCFS revenue, a one-time rebate is likely the best means to encourage PEV adoption because it would be provided to all PEV buyers as an up-front amount off the purchase of the EV.” *California Public Utility Commission Decision to adopt the LCFS Revenue Allocation Methodology*, p. 30 (December 2014).

Category	Automaker-Administered	Utility-Administered
Incentive Visibility	<ul style="list-style-type: none"> Automakers and dealers have natural touch-points with EV consumers at the point of sale, ensuring that every EV buyer is aware of the incentive and receives it 	<ul style="list-style-type: none"> Current programs are not available at point-of-sale Consumers are generally unaware that programs exist (Pacific Gas & Electric estimates that only 40% of eligible consumers will sign up for its incentive⁷)
Incentive Eligibility	<ul style="list-style-type: none"> Incentive available statewide only to <i>new</i> customers ensuring incentives actually motivate EV purchase decisions Automakers have flexibility to determine how to structure their incentives, with a natural motivation to compete with their peers to win EV market share 	<ul style="list-style-type: none"> Sacramento Municipal Utility District's program allows customers who purchased a vehicle in the last 180 days to apply. Other programs do not have restrictions on when the vehicle was purchased (e.g. consumers who purchased an EV in 2013 can still claim a rebate)
Taxes	<ul style="list-style-type: none"> Consumers would receive the incentive at the point of sale and face no tax on the incentive value Automakers do not have to issue a 1099 tax reporting form to customers 	<ul style="list-style-type: none"> If utilities provide a rebate \geq\$600, they will have to issue a 1099 tax form to consumers, who may then face taxes on the incentive value
Timing	<ul style="list-style-type: none"> If modifications are made in this rulemaking, automakers could launch their point-of-sale incentive programs starting in Q1'19 	<ul style="list-style-type: none"> The timing of when consumers receive the benefits varies depending on the program design (e.g. one-time check provided in the mail or annual bill credit) Processing times vary by utility as to when consumers will receive a rebate check (weeks or months)
Incentive Value	<ul style="list-style-type: none"> Targeting \$1,000+ incentive for long-range, 100% Zero Emission Vehicles Automakers can finance future credit generation to boost near-term incentive values 	<ul style="list-style-type: none"> Incentives amounts vary (e.g. \$200 Pasadena Water & Power, \$599 SMUD, SDG&E bill credit \geq \$50) Charger rebates vary in amount and eligibility
Funding Availability	<ul style="list-style-type: none"> Automakers have extensive experience offering incentives to car buyers through their retail networks and can adjust available incentives in real-time to avoid funding gaps Automakers can bank and trade credits on a monthly or quarterly basis with actual charging data to replenish funds quickly 	<ul style="list-style-type: none"> Utilities receive credits from CARB on an annual basis; potential for funding gap during the year Automakers / dealers have no visibility into funding levels, making it challenging to market the rebates to consumers during the sales process
Admin Costs	<ul style="list-style-type: none"> Automakers already have the structure to administer statewide vehicle incentives No incremental marketing expense, as incentives could be advertised in conjunction with general EV advertising and also communicated at the point of sale 	<ul style="list-style-type: none"> Utilities may incur significant advertising and marketing expenses to promote their programs The three participating IOUs estimated that they will spend \$2.9M in administrative costs in 2018
Data	<ul style="list-style-type: none"> Participating automakers will submit aggregated charging data to CARB as the basis for crediting 	<ul style="list-style-type: none"> The current methodology requires CARB to estimate the amount of residential charging occurring in each utility service territory
Equity	<ul style="list-style-type: none"> Automakers can offer a bonus incentive to low-income EV buyers and members of disadvantaged communities CARB can review and approve automaker program proposals to ensure they address this important component 	<ul style="list-style-type: none"> The current incentive programs do not include an equity component

⁷ Pacific Gas and Electric Company's 2018 Annual Low Carbon Fuel Standard Credit and Revenue Estimate, p. 5 (September 2017). https://www.pge.com/tariffs/assets/pdf/adviceletter/ELEC_5150-E.pdf

To administer this proposed approach, CARB would exclude the vehicles manufactured by participating automakers when calculating utility residential credit allocations. This approach does not preclude utilities from continuing their rebate programs, as they could provide incentives for vehicles brands that have not opted in to the residential LCFS pathway.

The proposed change would yield a near-term, statewide and point-of-sale incentive for EV consumers. We urge CARB to implement this change as quickly as possible as consumers will greatly benefit from a clear, consistent and transparent incentive program.

III. Approve staff's proposal, with modifications, to allow book-and-claim accounting for renewable electricity supplied as a transportation fuel and allow automakers to generate these credits by matching solar production data with fleet-wide, aggregated charging data from vehicle telematics.

We support staff's proposal to allow credits to be earned based on the matching of recorded residential and non-residential EV charging with renewable solar energy generation. This proposal will boost incentive values for consumers and support continued deployment of renewable energy in California.

The proposed requirements for "indirect accounting for renewable electricity" via "book-and-claim accounting for renewable or low-CI electricity supplied as a transportation fuel" are an improvement over the existing program design, where currently only on-site renewable energy can be matched with charging.⁸ Tesla supports the following elements of CARB staff's proposal:

- Physical traceability is not required as long as the renewable electricity is supplied to the grid within a California Balancing Authority.
- Book-and-claim accounting for renewable electricity may span two quarters, which is reasonable from an administration perspective.
- Credit generators are able to use book-and-claim accounting to match renewable electricity with charging not only through the Green Tariffs Shared Renewables Program but also through other contractual relationships, which allow credit generators other than utilities to participate.
- Credit generators can retire the associated Solar Renewable Energy Certificates (SRECs) of the renewable electricity that is matched, which ensures additionality.

These provisions appropriately balance accountability and additionality with administrative feasibility.

To enhance the clarity of staff's proposal and ensure administrative feasibility, we request three modifications:

- Add language clarifying that an automaker with actual EV charging data and a contractual right to a given quantity of SRECs may match the renewable energy produced with the fleet-wide, aggregated EV charging data to generate incremental LCFS credits. Remove burdensome and overly detailed reporting requirements related to EV charging sessions.

⁸ CARB Rulemaking Documents: ISOR Appendix A (p. 156-157)

- Remove requirement for parties to disclose pricing information on generation invoices to the Executive Officer, as this information is commercially sensitive and not relevant to the pathway.
- Provide additional guidance on who has the first right to credits in the event of that multiple parties claim credits for the same charging events.

We appreciate CARB staff's proposal to allow credit generators to match EV charging data with off-site renewable energy generation to earn incremental LCFS credits using a 0 CI value. These changes are aligned with California's renewable energy goals and will help spur near-term EV adoption. With the proposed modifications, CARB can provide the necessary guidance to market participants and ensure this new pathway is successful.

IV. Approve staff's proposal to update the EER for heavy-duty EVs.

Tesla supports CARB's proposal to increase the EER for heavy-duty EVs from 2.7 to 5.0 based on CARB's analysis of "Battery Electric Truck and Bus Energy Efficiency Compared to Conventional Diesel Vehicles".⁹ This adjustment reflects the dramatically higher efficiency of the electric powertrain versus conventional combustion engine technology.

As EERs are often a comparison of miles per gasoline gallon equivalent (MPGe), we encourage CARB to revisit the appropriateness of the EER for light-duty EVs in the next rulemaking using this methodology. The 2015 average U.S. light duty vehicle fuel efficiency was 22.0 miles per gallon of gasoline.¹⁰ For currently available EVs (including the Tesla Model S, X and 3 and the Chevy Bolt, among others), the average miles per gallon equivalent is 103.5. Therefore, given an equivalent amount of energy, an EV travels approximately 4.7 times further than an ICE vehicle. This difference should be reflected in the EER for light-duty EVs, which is currently set at only 3.4.

V. Approve staff's proposal to increase the statewide CI reduction target to 20% by 2030.

Tesla supports staff's proposed CI reduction target of 20% by 2030 in this rulemaking. Tesla agrees that increasing the stringency of the LCFS carbon intensity target is necessary to achieve California's 2030 GHG emissions reduction goal, and maintaining steady carbon intensity reductions through 2030 is essential to ensure the ongoing success of the program. Given the anticipated electrification of the heavy-duty sector and significant growth in EV adoption across the state, the state should easily exceed the proposed target of 20% by 2030. Tesla encourages staff to explore increasing the targets in future rulemakings if the market becomes oversupplied with credits, as this will ensure that the program continues to drive progress toward cleaner fuels.

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⁹ <https://www.arb.ca.gov/msprog/actruck/docs/HDBEVefficiency.pdf>

¹⁰ *Average Fuel Efficiency of U.S. Light Duty Vehicles*. Bureau of Transportation Statistics (2015). <https://www.bts.gov/content/average-fuel-efficiency-us-light-duty-vehicles>

Based on the foregoing, we believe CARB should i) permit automakers to earn additional LCFS credits based on actual charging data versus CARB estimates, ii) allow automakers to access base residential pathway credits and administer statewide, point-of-sale incentive programs for EV consumers, iii) modify the proposed book-and-claim accounting language to ensure a smooth implementation of this pathway, iv) increase the heavy-duty EER to reflect the efficiency of EV powertrains and v) increase the 2030 CI reduction target to 20% to ensure the state continues to reduce the carbon intensity of its transportation fuels. These changes could be implemented immediately upon conclusion of the rulemaking process, and the value generated from the sale of credits would directly benefit California consumers, accelerate the adoption of zero emission vehicles and increase renewable energy generation.

Tesla appreciates the opportunity to provide comments, and we believe in the potential of this program to dramatically accelerate California's transition to sustainable, zero-emission transportation. We share CARB's vision for a sustainable future and look forward to continuing to collaborate with staff to achieve the goals of the program. Thank you for your time and consideration in this matter.

Sincerely,

A handwritten signature in black ink that reads "Ken Morgan". The signature is written in a cursive, flowing style.

Ken Morgan

Director, Business Development & Government Affairs

Tesla, Inc.