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California Air Resources Board

Subject: Comments of Smart EV Charging Group on ARB Pre-Rulemaking Public Meeting to Discuss 2018 LCFS Amendments (August 7, 2017)

Electric Motor Werks, Inc. ("eMotorWerks"), ChargePoint, WattTime – a subsidiary of the Rocky Mountain Institute ("RMI"), Sonoma Clean Power ("SCP"), MCE Clean Energy ("MCE"), Lancaster Choice Energy ("LCE"), Peninsula Clean Energy ("PCE"), Silicon Valley Clean Energy ("SVCE"), American Honda Motor Co., Inc. ("Honda"), collectively known as the "Smart EV Charging Group", appreciate the opportunity to present specific proposals to the Air Resources Board ("ARB") for the enhancement of the Low Carbon Fuel Standard Regulation ("the Regulation") to recognize various smart EV charging strategies as verifiable pathways to reducing the carbon intensity of California's transportation fuel.

Introduction

Under the current Regulation, electricity from the electric grid supplied to an EV charging station qualifies for the carbon intensity (CI) value associated with ELC002_1, which is supposed to equal the average emissions rate of California's electric grid. However, for EV charging that is directly metered and intentionally, dynamically 1) scheduled to mitigate coincident emissions of the electric grid over each charging session or 2) managed to maximize the consumption of dedicated renewable power generation, ELC002_1 does not accurately represent the appropriate CI value associated with the electricity supplied to an EV charging station. As it currently exists, the Regulation does not provide any incentive for EV charging to occur with the express intent to reduce carbon intensity. Amendments to the Regulation should be made to recognize these opportunities to reduce the carbon intensity of transportation. In addition, amendments should be made to recognize lower CI source EV charging due to a Load Serving Entity taking significant procurement actions to reduce the carbon intensity across its entire customer portfolio.

In these comments, the Smart EV Charging Group will outline detailed proposals for the ARB to consider as the basis to recognize the benefits of these EV charging activities:

1. GHG Minimization with Intentional, Dynamic EV Charging Scheduling
2. Synchronizing EV Charging with Dedicated Renewable Energy Generation
3. EV Charging from Verified Lower Carbon Intensity Electricity Supply Sources

1. GHG Minimization with Intentional, Dynamic EV Charging Scheduling

EV charging sessions in the residential, commercial and certain industrial or fleet segments are commonly called “long dwell” sessions because the owner / operator requires a certain number of hours to reach full battery charge, but the vehicle “dwells” at charging station for longer than the time required, often several multiples of the time required. As a result, there is significant flexibility as to the exact time periods when the vehicle can be charged.

In the comments to the ARB submitted on April 17, 2017, eMotorWerks describes a current product offering, “JuiceNet Green,” in partnership with WattTime, a subsidiary of the Rocky Mountain Institute, whereby EV owners and/or EV station site hosts opt-in to having charging scheduled to minimize the amount of GHG emissions resulting from their charging sessions. WattTime’s software detects real-time variation in the marginal rate of emissions in specific areas of electric grids and coordinates with EV charging service providers to actively monitor and mitigate GHG emissions in real-time by scheduling charging at moments of lower marginal emissions intensity and directly reducing emissions at power plants on the same grid. Ultimately, through this smart GHG charging, higher proportions of renewable energy can be integrated into regional and sub-regional electric grids.

The Smart EV Charging Group proposes that the Board allow opt-in parties for EV charging to request custom CI pathways which would grant incremental credits based on the unique CI of intentional, dynamic EV charging scheduled to reduce GHGs emissions by optimizing against real-time marginal GHG emissions. The structure and eligibility considerations of such custom CI pathways are contemplated as follows:

1. Opt-In Parties Eligible to Generate Credits (in 95483(e))
    a. For non-residential segments, including business / workplace, fleets, public access and other forms of electrified industrial transportation, currently eligible opt-in parties, such as the site host or a EV Service Provider (EVSP), shall be eligible to apply for a smart GHG charging custom CI pathway.
    b. For the residential segment, new opt-in parties should be authorized to apply for a smart GHG charging custom pathway in an amendment to the Regulation, including EVSPs, EV manufacturers and non-EDU LSEs. EDUs would also be able to apply for a smart GHG charging custom CI pathway and generate additional credits.
2. Eligibility to Generate Credits with a Smart GHG Charging Custom CI Pathway
    a. Once a regulated or opt-in party has applied for a smart GHG charging custom pathway, the party must submit to the Executive Officer
        i. an attestation of intent to deploy smart GHG charging for purposes of generating credits,

ii. evidence of its capability, solely or in partnership, to implement smart GHG charging through software and hardware technologies,
iii. stated intent to generate credits from smart GHG charging in a segment - i.e., for residential, public access, fleet, forklift, and/or business / workplace,
iv. proposed custom CI of Electricity level(s) for purposes of calculating credits, and
v. Data and technical support for proposed custom CI of Electricity level(s)

3. Methodology to Assign Custom CI of Electricity
    a. As identified in 2.a.iv. & v. above, the party requesting a custom pathway(s) will be required to propose and provide support for each custom CI.
    b. For each custom CI proposed for a domain of charging segment, i.e., residential, business/workplace, etc., the party must submit:
        i. parameters of typical (or actual historical) charging behavior – plug-in and plug-out times of day, average charging volumes (kWh) per session / day, average charging demand (kW)
        ii. time series of interval usage amounts from "baseline" charging, i.e., without managed scheduling
        iii. time series of interval usage amounts from smart GHG charging, i.e., managed scheduling to minimize marginal emissions over sessions
        iv. time series of marginal GHG emissions by interval, including any geographic or balancing authority differences
        v. change in marginal GHG emissions over the period from smart GHG charging
    c. ARB Staff would review the proposed CI and supporting data sets in order for the Executive Officer to approve, reject or request additional support or information for each proposed custom CI.
    d. Once the custom CI is approved, it can be utilized by the submitting party to generate credits during the calendar quarter for which the custom CI was approved.
4. Level of Credits Generated for Reporting EV Charging Volumes
    a. The custom CI approved by the Executive Officer would be used in the formula to calculate the number of credits generated for each MWh of reporting EV charging volumes.
    b. Within the credit generation calculation, the CI for Electricity would be adjusted downward from the California Grid Electricity (ELC002_1) by the absolute change in marginal GHG emissions achieved based on the modeled and approved smart GHG charging.
    c. For non-residential FSE charging volumes, the resulting credit generation rate based on the custom CI shall be the level of credits generated per MWh of reported EV charging volumes utilizing the custom CI to adjust ELC002_1 downward. .

d. For residential FSE charging volumes, the difference between the credits generated under the ELC002_1 CI and the custom CI (in b. above) shall be the level of credits generated per MWh of reported EV charging volumes utilizing the custom CI.

5. Quarterly Reporting Requirements
    a. Reporting entities would submit the Fueling Facility Report (FFR) template for Fueling Station Equipment beginning participation in a calendar quarter with an approved custom CI.
        i. For the residential segment, the FFR would include the following for each directly metered EVSE:
            a. FEIN of Reporting Entity
            b. Street Address
            c. City
            d. State
            e. Zip
            f. EV – FSE Serial Number or Unique ID, if applicable
            g. EV – FSE Manufacturer Name, if applicable
            h. Vehicle Identification Number, if applicable
            i. Charging Data Source – EVSE or EV
            j. Electric Utility Name
            k. Electricity Supplier Name
            l. Electric Utility Account Number
        ii. For non-residential segments, the FSE registration process is unchanged.
    b. Once a Fuel Station Equipment (FSE) is approved by ARB Staff, the reporting entity would submit the quarterly EV charging volumes.
    c. The LRT-CBTS system or ARB Staff would need to be able to associate the custom CI authorized for FSE and the charging volumes in order to generate the appropriate credit values.
6. Data Retention Requirements & Auditing Considerations
    a. Reporting entities will be required to retain or have ready access to provide
        i. Time series of interval usage amounts associated with all reported EV charging volumes
        ii. Time series of marginal GHG emissions by interval
            1. This data set would need to be sourced from the same entity which supplied the dataset to establish the approved custom CI.
    b. ARB Staff may request access to retained data annually for purposes of auditing and validating the custom CI. A tolerance of +/- 20% of the originally estimated smart GHG charging CI on a total marginal GHG basis in gCO2e/MJ is suggested.
        i. ARB Staff may choose to audit all or a portion of the FSE reporting kWh to validate the custom CI level.

ii. If a custom CI is determined to be outside the tolerance band, ARB Staff would direct the reporting entity to re-submit for a custom CI to be approved for use in the subsequent calendar year.

An amendment to the Regulation to implement these custom CI pathways would encourage not only individuals and commercial entities, but also electric utilities and non-utility load serving entities to engage in smart GHG charging activities which reduce the carbon intensity of transportation fuel as well as the California electric grid.

For an individual electric vehicle or charging station, the existence of an incentive for smart GHG charging may induce behavioral change unto itself, by offsetting the cost to acquire smart GHG charging capabilities.[1] The value of LCFS credits could also be bundled with other smart charging incentives in existence now or in the future, such as demand response programs, which compensate customers for smart charging participation.

For load serving entities, the aggregation of LCFS credits from smart GHG charging from a multitude of customers could be utilized and leveraged to encourage EV adoption such as rebates on EVs and related infrastructure, as well as marketing, education and outreach.

For illustration purposes, shown in Table 1, the following scenarios of smart GHG charging by segment would produce the following magnitude of LCFS credits annually per station.

For a load serving entity, every 750 residential customers participating in smart GHG charging, the incremental benefit of the custom CI above would equate to approximately $100,000 over 5 years at today's LCFS credit values. As the fraction of renewables increases on the grid and renewables curtailment coincidentally increases, the avoided GHG emissions per EVSE is expected to increase dramatically from these estimates.

[1] For example, one smart GHG charging product is currently available for a one-time cost of $50 per residential EV charging station.

Table 1: Smart GHG Charging Illustrative Incremental LCFS Credit Generation

Segment	Residential	Workplace	Fleet
# of EVSE	1	10	10
Annual kWh	3,900	15,600	91,000
Avoided GHG	21.3	17.0	21.3
Current Credits	** 0 **	12.5	103.1
Incremental Credits (1Yr)	0.3	1.0	7.0
Current Value	$0	$1,127	$9,279
Incremental Value (1Yr)	$27	$86	$628
Incremental Value (5 Yr)	$135	$430	$3,141

See Appendix for assumptions used to derive Custom CI by segment
Assumes an LCFS credit value of $90 per credit.
*** Residential credits currently accrue to EDU based on estimation of kWh and ELC002_1*

2. Synchronizing EV Charging with Dedicated Renewable Energy Generation

The Regulation currently allows for non-residential EV charging direct from renewable energy to receive a CI value of 0.0 gCO2e/MJ; however, this pathway has not been well utilized potentially due to an interpretation that renewable energy must come from "dedicated (non-grid)" sources (95488(b)(2)(D) & (F)(i)) and "indirect accounting mechanisms" are not permitted. The Smart EV Charging Group proposes that EV charging synchronized with dedicated renewable generation be granted a zero CI source,[2] provided that charging is actively managed to maximize consumption of renewable generation, when available, and direct metering of EV charging and renewable generation is available to the ARB for validation.

In the comments to the ARB submitted on April 17, 2017, eMotorWerks explained that smart charging technologies can synchronize EV charging with dedicated renewable power generation - co-located or offsite - to maximize the amount of renewable energy utilized for EV charging.

Encouraging EV consumption of co-located renewable energy not only reduces the CI of the transportation fuel for EVs, but it can also benefit the electricity distribution system by reducing

[2] In the case of synchronization with behind the meter renewables, a negative CI source is proposed subsequently herein.

the amount of electricity exported to the grid. For example, in instances of low electricity demand on a local circuit and high rooftop solar generation, distribution infrastructure can become stressed by the reverse flow of electrons, known as backfeed, which can reduce useful life of infrastructure or even cause faults or outages, if not managed properly. Currently, net energy metering (NEM) tariffs in the California do not incentivize self-consumption. The extension of LCFS credits that explicitly rewards EV consumption of behind the meter solar could be a useful incentive to reduce exports.

Currently, the Regulation does not allow for residential EV charging from renewable generation to access the 0.0 gCO2e/MJ CI value. Electricity distribution utilities receive all LCFS credits from residential EV charging. These credits are allocated based on an estimation methodology because the availability to the EDUs of direct metering information is minimal. Because the estimation methodology is utilized, there is no incentive currently within the Regulation to encourage directly metered EV charging that is synchronized with dedicated renewable generation; therefore generally, it does not occur.

The Smart EV Charging Group proposes that the Board allow opt-in parties for EV charging to be eligible to use a renewable, zero CI for the portion of EV charging which is synchronized with dedicated renewable generation. The structure and eligibility considerations for use of the renewable, zero CI are contemplated as follows:

1. Clarification to Definition of Dedicated, Low-CI Source
    a. To enable generation of credits for synchronized EV charging from renewable, zero CI sources, the definition of "Electricity, … from … dedicated, low-CI sources" in 95488(b)(2)(D) needs to be clarified as follows:

        Electricity, whether from the public grid or from dedicated, low-CI sources, defined as renewable electricity
        i. from a dedicated (non-grid) form of generation, or
        ii. intentionally synchronized with electric vehicle charging

2. Opt-In Parties Eligible to Generate Credits (in 95483(e))
    a. For non-residential segments, including business / workplace, fleets, public access, forklifts and other forms of electrified industrial transportation, currently eligible opt-in parties, such as the site host or EV Service Provider (EVSP), shall be eligible to generate credits from synchronizing EV charging with a renewable, zero CI source.
    b. For the residential segment, new opt-in parties should be eligible to charge EVs from a renewable, zero CI source in an amendment to the Regulation, including EVSP, EV manufacturers and non-EDU LSEs.
3. Eligibility to Generate Credits with a Renewable, Zero CI source

a. Once an opt-in party has applied to use a renewable, zero CI source, the party must submit to the Executive Officer
    i. an attestation of intent to deploy technology to maximize dedicated renewable generation consumption,
    ii. evidence of its capability, solely or in partnership, to implement dedicated renewable generation consumption through software and/or hardware technologies, including energy storage, if applicable, and
    iii. stated intent to generate credits from smart GHG charging in a segment - i.e., in residential, public access, fleet, forklift, and/or business / workplace
b. ARB Staff would review the submission and supporting evidence of dedicated renewable generation consumption capabilities in order for the Executive Officer to approve, reject or request additional support or information.
c. Once the permission to generate credits with a renewable, zero CI source is approved, it can be utilized by the submitting party to generate credits during the calendar quarter the renewable, zero CI was approved.

4. Methodology to Assign Renewable, Zero CI of Electricity to EV Charging Volumes
    a. All EV charging identified as from the renewable source would utilize a renewable, zero CI for such volumes
    b. All EV charging identified as from non-renewable source would default to utilizing the California electric grid CI (ELC0002_1)
        i. However, the party would be allowed to request a custom CI for this grid source electricity as outlined above (GHG Minimization with Intentional, Dynamic EV Charging Scheduling)
5. Level of Credits Generated for Reporting EV Charging Volumes
    a. The California electric grid CI (or custom CI, if applicable) would be used in the formula to calculate the number of credits generated for the MWh of reporting EV charging volumes from the non-renewable source
        i. In residential charging volumes, without use of a custom CI, there would be no credits generated as credits arising from California electric grid CI are earned by the EDU in volumes based on an estimation methodology
        ii. In the non-residential segment, without use of a custom CI, there would be no change in the calculation of credits generated.
    b. The renewable, zero CI would be used in the formula to calculate the number of credits generated for the MWh of reporting EV charging volumes from renewable sources.
        i. Renewable, zero CI should in fact be *less* than zero for co-located dedicated renewable generation because on-site consumption avoids the need from transmission-level generation, which experience line losses. A 2017 CPUC report cited average investor-owned utility line losses of

6.26% in 2016.[3] If using this figure, the negative CI value would therefore be (6.26%) times ELC002_1 CI. Using the current ELC002_1 of 105.16 gCO2/MJ, the zero CI should be (6.58) gCO2e/MJ. If dedicated renewable generation is not co-located, then the CI would remain zero.

1. For residential charging volumes, the difference between the credits generated under the ELC002_1 CI and the renewable CI shall be the level of credits generated per MWh of reported EV charging volumes from renewable sources.
2. For non-residential charging volumes, the resulting credit generation rate based on the renewable CI shall be the level of credits generated per MWh of reported EV charging volumes utilizing the renewable CI.

6. Quarterly Reporting Requirements
    a. Reporting entities would submit a Fueling Facility Report template for Fueling Station Equipment beginning participation in a calendar quarter with an approved renewable, zero CI.
        i. For the residential segment, a single FSE registration shall be submitted for each directly metered EVSE.
            1. The required FSE information for the template would include at least the following:
                a. FEIN
                b. Street Address
                c. City
                d. State
                e. Zip
                f. EV - FSE Serial Number or Unique ID, if applicable
                g. EV – FSE Manufacturer Name, if applicable
                h. Vehicle Identification Number, if applicable
                i. Charging Data Source – EVSE or EV
                j. Renewable Generator Meter Serial Number or Unique ID
                k. Electric Utility Name
                l. Electricity Supplier Name
                m. Electric Utility Account Number
        ii. For non-residential segments, the FSE registration process may need an additional field to associate the FSE with renewable generation.
            1. ARB should assess whether a Renewable Generation Equipment registration template needs to be created and submitted by reporting entities.

[3] "Report: System Efficiency of California's Electric Grid" by California Public Utilities Commission, 2017. http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/About_Us/Organization/Divisions/Policy_and_Planning/PPD_Work/PPD_Work_Products_(2014_forward)/System_Efficiency_Report%20PPD_May_24_Final.pdf pg 7, Table 2.

a. Because multiple renewable generators can comprise the dedicated renewable generation, ARB should register renewable generators in the same manner as occurs with EVSEs, whereby multiple FSEs are associated with a single master ID.

b. Once a Fuel Station Equipment (FSE) is approved by ARB Staff, the reporting entity would eligible to submit the quarterly EV charging volumes

c. Reporting entities would be required to submit the following quarterly EV charging volumes from 1) renewable CI sources and 2) grid sources as separate fuel transactions with the appropriate CI (from the drop down menu, if no custom CI is utilized).

7. Data Retention Requirements & Auditing Considerations
    a. Reporting entities will be required to retain or have ready access to provide
        i. Time series of interval usage amounts associated with all reported EV charging volumes,
        ii. Time series of interval usage amounts associated with all dedicated renewable generation related to reported EV charging volumes, and
        iii. If energy storage is utilized,
            1. Time series of interval charging of energy storage from dedicated renewable generation related to reported EV charging volumes,
            2. Time series of interval discharging of energy storage related to reported EV charging volumes, and
            3. Time series reconciliation of EV charging from renewable generation, renewable charged energy storage and grid sources.
    b. ARB Staff may request access to retained data annually for purposes of auditing renewable, zero and grid CI source
8. Definition of Dedicated Renewable Generation
    a. Initially, the Executive Officer shall only approve dedicated renewable generation for use of a renewable, zero CI source when the renewable generation is co-located
        i. “Co-located” should not be interpreted unnecessarily restrictive; it should be defined as EV charging and renewable generation occurring:
            1. At the same physical campus, and
            2. By a common host entity, including
                a. Owner occupant,
                b. Landlord, or
                c. Tenant
    b. The Executive Officer shall be able to approve a non co-located dedicated renewable generation for use of a renewable, CI source when ARB Staff develops operating and reporting requirements for approving an entity’s proposal.

An amendment to the Regulation to implement a renewable, zero CI source for EV charging from dedicated renewable generation would encourage greater integration of renewable generation into California's electric system, particularly at the distribution level.

For an individual electric vehicle or charging station, the existence of an incentive for renewable, zero CI sources may induce behavioral change unto itself, but would likely be bundled with other services and benefits related to renewable generation EV charging, such as net energy metering (NEM), demand response programs and the Self-Generation Incentive Program (SGIP), if applicable. A high percentage of EV owners also possess rooftop solar installations and are prime candidates for the adoption of energy storage.

For a load serving entity, the potential to aggregate LCFS credits from synchronized EV charging arising from dedicated renewable generation could not only generate funds to encourage EV adoption via rebates, infrastructure, marketing, education and outreach, but also by reducing ratepayer costs of electricity procurement.

For illustration purposes, shown in Table 2, the following scenarios of renewable, zero CI by segment would produce the following magnitude of LCFS credits. These estimates are conservative as they do not reflect dynamic management of EV charging to maximize renewable consumption. In the residential scenario, if non-renewable CI source EV charging (i.e., during the evening and overnight) is scheduled to minimize marginal GHG and granted a custom CI pathway, as proposed in proposal #1 above, the combined annual value of incremental LCFS credits would be approximately $40 to $60 annually, depending on charging volumes and times of the day.

For a load serving entity, every 700 residential customers participating in EV charging synchronized with dedicated renewable energy generation, assuming the above estimates, the incremental benefit of the renewable CI source would equate to approximately $100,000 over 5 years at today's LCFS credit values.

Table 2: Dedicated Renewable Energy Illustrative Incremental LCFS Credit Generation

Segment	Residential	Workplace	Workplace
# of EVSE stations	1	1	6
EV (kWp AC)	9.4	18	46.2 (7.7 per)
Solar (kWp AC)	8.3	5.9	25
Annual Solar (kWh)	16,000	11,200	51,400
Annual EV (kWh)	2,800	6,200	14,000
Charging from Solar	800	2,400	11,400
Charging from Grid	2,000	3,800	2,600
% Renewable	29%	39%	81%
Current Credits	** 0 **	5.0	11.2
Incremental Credits	0.3	1.0	4.6
Current Value	$0	$448	$1,011
Incremental Value (1 Yr)	$29	$87	$413
Incremental Value (5 Yr)	$145	$434	$2,064

Solar Generation estimates based on PV Watts (hourly data)
EV Charging based on actual interval data at 3 locations, BEFORE smart charging to maximize renewable consumption
Assumes an LCFS credit value of $90 per credit
Analyzed 6 months of charging in 2017, compared to Jan - June generation; all statistics multiplied by 2
*** Residential credits currently accrue to EDU based on estimation of kWh and ELC002_1*

3. EV Charging from Verified Lower Carbon Intensity Electricity Supply Sources

The Smart EV Charging Group submits that the current Regulation fails to recognize the aggressive actions taken by certain LSEs and end customers to reduce the carbon intensity of the electricity supplied for EV charging. In particular, Community Choice Energy (CCE) LSEs possess electricity generation portfolios with low carbon intensity to serve EV charging occurring in their territories. The current Regulation does not provide an incentive for opt-in parties or CCE LSEs to secure lower carbon intensity electricity, but rather the benefits of lower CI procurement will accrue to other entities through the statewide average CI. There are reasonable amendments to the Regulation that can be made, which would neither alter the current accounting and crediting methodologies for EDUs, nor require changes to the CPUC-approved EDU rebate programs. The proposal described below would support EV charging programs that CCEs and other EVSPs are already marketing to customers by providing a meaningful crediting opportunity and new funding source to initiate and grow programs. This section provides the ARB Staff with a proposed approach for recognizing lower carbon intensity of electricity for EV charging .

1. To recognize lower carbon intensity electricity supply portfolios for EV charging current and new opt-in entities to need to be eligible to apply for and/or utilize a custom CI pathway based on the carbon intensity of the applicable LSE portfolio.
    a. CCE LSEs would need to become eligible as a new opt-in entity for EV charging within the Regulation, for purposes of generating credits from the residential segment.

2. To enable generation of credits from these sources, the definition of "Electricity, … from … dedicated, low-CI sources" in 95488(b)(2)(D) needs to be clarified as follows:

    Electricity, whether from the public grid or from dedicated, low-CI sources, defined as renewable electricity
        i. from a dedicated (non-grid) form of generation, or
        ii. [see above proposal]
        iii. intentionally purchased for a specific set of customers who opt to receive generation service from a Load Serving Entity

3. To calculate the custom CI, LSEs would utilize GHG information reported to CARB for the specific generation units the LSE contracts from, and for GHG information for unspecified system power, LSEs would rely on CARB's CI for system power. This calculation would then be verified by an independent (e.g. The Climate Registry) or CARB-approved (e.g. Power Source Disclosure reporting) entity to demonstrate a lower CI source than the statewide average (ELC002_1). Calculations would be done annually, and in arrears once data from the prior reporting year is available. The opt-in entity would receive LCFS credits based on the following CI values:

    - The lesser of:
        - Difference between the CCE LSE CI and ELC002_1
        - Difference between the CCE LSE CI and applicable EDU LSE CI

    This would ensure accurate emission reduction reporting as the established CI pathway would only reward electricity supplied for EV charging that goes beyond the statewide grid average *and* the emissions levels of the applicable EDU.

4. As with the existing EDU crediting rules for the residential segment, charging volumes per residential EV would be based on an estimation methodology defined by ARB, and the number of applicable EVs would be derived from DMV data. Vehicles registered within an LSE's territory would be credited to that LSE.[4]

[4] If necessary, the customer participation rate of a CCE LSE could be used to attribute the share of EVs in the territory served by the CCE LSE (e.g. if a CCE has 90% participation of eligible accounts, the CCA would receive credits for 90% of the EVs registered in their territory).

5. If a CCE LSE has established its LCFS crediting rate with the ARB based on its lower CI electricity supply, then non-residential opt-in entities should be authorized to utilize the lower CI value to generate LCFS credits based on the directly reported quarterly EV charging volumes. The FSE registration template would need to be revised to include Electricity Supplier Name so that the ARB can associate or validate the registration with the correct lower CI value.

The proposed generation of LCFS based on the CCE LSE CI should not be at the exclusion of the ability to earn additional credits through intentional, dynamic carbon intensity reducing actions taken by individual EV owners and EVSE operators, as above in proposals #1 and #2.

The Smart EV Charging Group recognizes that the above proposal regarding lower carbon intensity electricity supply has relevance to the ARB Discussion Paper proposal to allow for an "improved carbon intensity score if it: (1) is obtained through a program with eligibility requirements that match or are more stringent than the Green Tariff Shared Renewables (GTSR) Program under California Public Utilities Code Section 283111."[5] While enrollment in such programs or tariffs is often minimal (<1% of eligible accounts), the Smart EV Charging Group supports recognition of efforts by customers to reduce the carbon intensity of their electricity supply and does recommend that ARB Staff develop a workable framework to provide additional crediting mechanisms for customers who elect to charge from lower CI sources. These frameworks could incorporate concepts as proposed in these comments, such as proposals #1 or #2 above. In doing so, ARB should recognize within any Regulation amendment that GTSR or equivalent tariff enrollment does reduce carbon intensity of EV charging, but neither entirely so, nor in concert with EV charging.

Conclusion

The Smart EV Charging Group appreciates the opportunity to provide the Air Resources Board comments on the Electricity as a Transportation Fuel component of the Low Carbon Fuel Standard Regulation. The LCFS Regulation can play a critical role in better coordinating the decarbonization of the transportation and electricity systems, rather than pursued in isolation.

[5] "Electricity as a Transportation Fuel" ARB Staff, November 23, 2017, pg 4.
https://www.arb.ca.gov/fuels/lcfs/lcfs_meetings/12022016discussionpaper_electricity.pdf

About eMotorWerks

eMotorWerks developed and operates JuiceNet®, the leading electric vehicle (EV) cloud-based smart charging platform, and the company is the manufacturer of best-selling and best-rated residential EV charging station, the JuiceBox Pro, through Amazon.com and its own web store, with over 22,000 charging stations sold worldwide to date. eMotorWerks embeds the JuiceNet platform in its own residential and commercial EV charging stations, as well as third-party electric vehicle supply equipment (EVSE), including models from AeroVironment, Clipper Creek, Volta, Nayax, and a growing list of other manufacturers. JuiceNet is also being integrated into automobile models for direct smart control of EV charging via vehicle telematics. eMotorWerks is an "Opt-in Party" to the Regulation for EV charging.

Contact: David Schlosberg, Director, Energy Market Operations, david@emotorwerks.com

About ChargePoint

ChargePoint is the largest electric vehicle (EV) charging network in the world, with charging solutions for every charging need and all the places EV drivers go: at home, work, around town and on the road. With more than 39,000 independently owned charging spots and more than 7,000 customers (including workplaces, cities, retailers, apartments, hospitals and fleets), ChargePoint is the only charging technology company on the market that designs, develops and manufactures hardware and software solutions across every category. Leading EV hardware makers, automakers and other partners rely on the ChargePoint network to make charging station details available in mobile apps, online and in navigation systems for popular EVs. ChargePoint drivers have completed more than 21 million charging sessions, saving upwards of 26 million gallons of gasoline and driving more than 636 million gas-free miles.

Contact: Anne Smart, Vice President, Public Policy, anne.smart@chargepoint.com

About WattTime, a subsidiary of the Rocky Mountain Institute

WattTime's mission is to give everyone the freedom to choose the power they use. We are a non-profit subsidiary of the Rocky Mountain Institute catalyzing a movement to allow anyone to choose cleaner energy easily and automatically. Our technologies automatically detect which power plants will meet a user's demand and how clean that power will be. With this information, WattTime makes it possible with a software update to select which power plants a device relies on. Anything connected to the internet that consumes, generates, or stores power can optimize its activity to automatically reduce its carbon and pollutant footprint and simultaneously help clean and renewable power plants compete on the grid.

Contact: Matt Evans, Managing Director, matt@watttime.org

About Sonoma Clean Power

Sonoma Clean Power (SCP) is the public electricity provider for Sonoma and Mendocino counties. We provide customers with the option of using cleaner electricity at competitive rates from sources like solar, wind, geothermal and hydropower. SCP is a not-for-profit public agency, independently run by the participating cities and counties of Sonoma and Mendocino. SCP invests locally to support Sonoma and Mendocino County renewable power and local jobs, and also around California to get the most affordable sources of clean power. SCP is helping get our customers into EVs vehicles because we can fuel them with clean, low-emission electricity. We have partnered with seven local dealerships to provide purchase credits. With additional SCP incentives, available rebates & tax credits, it adds up to thousands saved.

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Silicon Valley Clean Energy

Silicon Valley Clean Energy (SVCE) is a community choice aggregator that provides reliable, affordable, carbon-free electricity to the communities of Sunnyvale, Mountain View, Cupertino, Los Altos, Los Altos Hills, Campbell, Saratoga, Morgan Hill, Monte Sereno, Gilroy, Los Gatos, and the unincorporated areas of Santa Clara County. SVCE has been in service since April 2017.

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Exhibit 1: Supporting Information on Smart GHG Charging Illustrative Examples

Segment	Residential	Workplace	Fleet
Plug-in Time	6:00 PM	8:30 AM	6:00 PM
Plug-out Time	7:00 AM	5:00 PM	7:00 AM
Daily kWh	15	6	35
Charge Rate kW	7.7	7.7	18
Days of Week	Weekdays	Weekdays	Weekdays
Location	S. California	S. California	S. California
gCO2e/MJ (Baseline)	104.3	97.3	104.3
gCO2e/MJ (Smart GHG)	84.2	81.3	84.2
Chg in CO2e	20.1	16.0	20.1
Chg w/ Line Losses	21.3	17.0	21.3

Line Losses assumed as 6.26% based on 2015 estimates.[6]

Exhibit 2: Supporting Information on Dedicated Renewable Energy Illustrative Examples

Segment	Residential	Workplace	Workplace
Solar Location	Hayward, CA	Mountain View, CA	Miramar, CA
EVSE Location	Norcal East Bay	Norcal Peninsula	San Diego
gCO2e/MJ (ELC002_1)	105.16	105.16	105.16
gCO2e/MJ (Renewable)	(6.58)	(6.58)	(6.58)

In this example, renewable energy is behind the meter solar
Line Losses assumed as 6.26% based on 2015 estimates.[7]

[6] See Footnote 1
[7] See Footnote 1