



**DATE:** December 4, 2017

**TO:** Sam Wade, Branch Chief  
Transportation Fuels Branch, Industrial Strategies Division  
California Air Resources Board (CARB)  
1001 I Street Sacramento, CA 95814  
*Filed electronically to: LCFSworkshop@arb.ca.gov*

**FROM:** Center for Sustainable Energy<sup>®</sup>

**RE:** Center for Sustainable Energy's Response to Pre-Rulemaking Public Meeting to Discuss 2018 LCFS Preliminary Draft Regulatory Amendment Text

Dear Mr. Wade:

The Center for Sustainable Energy<sup>®</sup> (CSE) is pleased to provide these comments in response to CARB's 2018 Low Carbon Fuel Standard (LCFS) Preliminary Draft Regulatory Amendment Text (amended LCFS Regulation),<sup>1</sup> discussed at the Pre-Rulemaking Public Meeting held November 6, 2017.

CSE provides these comments based on diverse experiences supporting the deployment of zero-emission and alternative-fuel vehicles and infrastructure, including administration of programs in New York, Massachusetts, and Connecticut. For California, CSE administers CARB's Clean Vehicle Rebate Project (CVRP) and the California Energy Commission's (Energy Commission) Block Grant for Electric Vehicle Charger Incentive Projects (CALeVIP). In addition, CSE has managed a variety of alternative-fuel vehicle projects, including Zero-Emission Vehicle (ZEV) readiness projects in the San Diego and San Joaquin Valley regions. CSE praises CARB's leadership on LCFS regulatory matters and the iterative process implemented to develop the amended LCFS Regulation, and we are appreciative of the rulemaking's transparent and public process. At this time, CSE provides comments in the following areas:

- I) *General Comments on Transportation Electrification*
- II) *Energy Economy Ratios (EERs)*
- III) *Renewable Electricity (EVs and Hydrogen)*
- IV) *Smart Charging and Smart Electrolysis*
- V) *Crediting for Renewable Propane*

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<sup>1</sup> Draft LCFS Regulatory text was released on September 22, 2017, and November 6, 2017.

## I) General Comments on Transportation Electrification

**Subsection 95483(e).** CSE supports the amended LCFS Regulation's expansion of subsection 95483(e), which now includes four additional transportation electrification (TE) modes. These amendments will encourage the expansion of TE and promote a variety of new and innovative approaches consistent with the statutory definition of TE per Senate Bill (SB) 350.<sup>2</sup> To further strengthen subsection 95483(e)'s alignment with SB 350, CSE encourages CARB to directly reference the statutory definition of TE in this subsection.

**Designees.** CSE supports modifications to the "designee" provision, which will boost eligible market actors. The "designee" provision<sup>3</sup> under consideration in section 95483.1<sup>4</sup> could expand LCFS market participation<sup>5</sup> by yielding unique partnerships and LCFS market diversity. To strengthen this provision, CARB should consider specifying how "designee" parties are different from current LCFS market actors (i.e., a fuel reporting entity, an entity opting into LCFS, and credit brokers).

**Backstop Aggregation.** CSE supports the extension of the backstop aggregation provision in the revised regulation.<sup>6</sup> While updated subsections 95483(e)(1) through (8) will cover many new TE modes, it is not comprehensive. As such, the "backstop" provision remains timely and consistent with SB 350's multi-sector policy approach<sup>7</sup> and may encourage a wider scope of TE innovation. To strengthen this provision and ensure transparency and information-sharing, CARB should require EDUs that use backstop aggregation to provide a quarterly, publicly-accessible, and readily-available report detailing its use (e.g., TE vehicle types, kilowatt hours used, etc.).<sup>8</sup> Such a report would be valuable to inform and educate stakeholders and the LCFS market by showcasing new and innovative use cases in the TE ecosystem. In addition, to encourage the use of (and innovation within) the backstop aggregation provision, CARB should prioritize other parties<sup>9</sup> ahead of EDUs as the primary recipient of backstop aggregation credit.

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<sup>2</sup> The statutory definition of "transportation electrification," codified in Public Utilities Code §237.5, is "the use of electricity from external sources of electrical power, including the electrical grid, for all or part of vehicles, vessels, trains, boats, or other equipment that are mobile sources of air pollution and greenhouse gases and the related programs and charging and propulsion infrastructure investments to enable and encourage this use of electricity." Website Access: [https://leginfo.ca.gov/faces/billNavClient.xhtml?bill\\_id=201520160SB350](https://leginfo.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB350)

<sup>3</sup> Under the new provisions, designees can be authorized by a fuel reporting entity to act on behalf of the fuel reporting entity in the LCFS program.

<sup>4</sup> Preliminary Draft of Potential Regulatory Amendments, Page 43.

<sup>5</sup> Specifically, current regulation limits market participation to a fuel reporting entity, an entity opting into LCFS, and credit brokers. From CSE's perspective, this limits potential avenues of market participation for actors outside of these specific roles.

<sup>6</sup> Preliminary Draft of Potential Regulatory Amendments, Page 38; This provision allows the Electrical Distribution Utilities (EDUs) to claim credit for "electricity as a transportation fuel not covered related subsections".

<sup>7</sup> See reference 1.

<sup>8</sup> This should be in supplement to the reporting requirements set forth in section 95483(e)(1)(B) through (D).

<sup>9</sup> These parties could include fleet operators, entities owning the equipment, and/or "designees".

## II) Energy Economy Ratios (EERs)

CSE supports the following revisions to the EERs and provides additional recommendations to strengthen them:

**Medium and Heavy Duty (MD/HD) EER updates.** Revised MD/HD EERs are the outcome of a successful stakeholder collaboration effort led by CARB in the Advanced Clean Transit (ACT) Program<sup>10</sup> and deploy policy modifications consistent with the 2016 ZEV Action Plan and SB 350 TE policy frameworks. CSE applauds CARB's ACT Program leadership and thanks the stakeholder group for producing the technical, data-driven research necessary to inform the revised EERs. CSE especially notes the potential for LCFS to act as a funding stream for the MD/HD sector and large fleet operators, which will likely be able to utilize a very large volume of electric miles. As such, CSE encourages CARB to undertake similar levels of granular analysis in alignment with the statutory definition of TE as codified in PUC §237.5<sup>11</sup> and recommends prioritizing the highest energy use TE sectors for the next phase of EER revision.

**Electric Motorbikes EERs.** This new EER clarifies that Electric Motorbikes are eligible for LCFS credits. Notably, there are six zero-emission motorcycles (ZEMs) eligible for CVRP.<sup>12</sup> However, the regulation would be strengthened by clarifying who is eligible to accrue ZEM credits and how they are distributed. Specifically, CARB should clarify if EDUs will claim ZEM credit under 95483(e)(1) through (8) or through an alternative method. If the latter, then a new and detailed ZEM-specific provision may be warranted. In this case, CSE would encourage CARB to distribute these credits within the already-existing utility programs to maintain uniformity and consistency for the ZEV customer base.<sup>13</sup>

**EERs for Electric Transport Refrigeration Units (TRUs).** This new EER clarifies that electric TRUs are eligible for LCFS credits. This will complement parallel policy initiatives including the California Sustainable Freight Action Plan (CSFAP), which seeks to deploy 100,000 ZEVs in the MD/HD sectors. The value of electric TRUs (and other ZEV equipment) will be pivotal in decarbonization initiatives in the logistics and distribution process and a key tool that will contribute significantly to increased system efficiency. To encourage expanded use of this EER and promote technology integration, CARB should consider providing additional credits for technology solutions that pair electric TRUs with on-board solar and battery storage (which would ostensibly increase the EER). Such technology is in the test phases; most notably a

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<sup>10</sup> <https://www.arb.ca.gov/msprog/bus/actmeetings.htm>

<sup>11</sup> See reference 2.

<sup>12</sup> CVRP Eligible Vehicles; Website Access: <https://cleanvehiclerebate.org/eng/eligible-vehicles>

<sup>13</sup> Specifically, PG&E's Clean Fuel Rebate program, SCE's Clean Fuel Rewards Program, and SDG&E's Electric Vehicle Climate Credit Program; Website Access: <https://www.arb.ca.gov/fuels/lcfs/electricity/utilityrebates.htm>

California-based TRU became the first-to-market battery powered unit for commercial use on a Class 7 truck route in Fresno.<sup>14</sup>

**EERs for Electric Airport Ground Support Equipment (GSE).** This provision is consistent with the 2016 ZEV Action Plan,<sup>15</sup> aligns well with California Public Utilities Commission (CPUC) direction to “consider innovative (TE) program designs”,<sup>16</sup> and could contribute significantly to increased system efficiency and GHG emissions reductions. While GSE is not typically purchased, owned, or maintained by airports, CSE contends that airport authorities—which operate as a public good and are governed by GHG emissions reduction and climate action plans<sup>17</sup>— are central stakeholders in the delivery of effective airport GSE logistics systems. As such, CSE recommends that airport authorities (not the EDU) should be the opt-in party for credit accumulation in the case that the entity operating the GSE opts out.<sup>18</sup> Moreover, to encourage technology innovation at airports, the airport authority should have the discretion to utilize the revenue from credits to fund program activities consistent with their respective GHG emissions reduction plans, including, but not limited to, ZEV fleet procurement and charging infrastructure expansion.

**Electric Airplane EERs.** CSE supports this provision in principle, which clarifies that electric airplanes are eligible for LCFS credits. Conceptually, electric airplanes fit within the TE and SB 350 policy framework and California’s ZEV policy ecosystem, and some airlines have stated that electrification technology is approximately 10 years away.<sup>19</sup> That said, this is an emergent technology, as no electric airplanes are currently available for use. To strengthen this EER, CARB should change the title from “electric airplanes” to “Electric Flying Vehicles (EFVs)” to ensure that this definition may cover non-fixed wing aircraft, such as helicopters and drone-style ‘taxis’. Notably, Uber announced a partnership with the National Aeronautics and Space Administration to explore flying taxi services in Los Angeles by 2020.<sup>20</sup> The vehicle they propose to use may suggest the need for a more flexible definition under the LCFS regulation, and as

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<sup>14</sup> <https://cleantechnica.com/2017/10/15/enow-shows-off-solar-powered-zero-emissions-rayfrigeration-transport-refrigeration-unit/>

<sup>15</sup> 2016 ZEV Action Plan; Page 22; Website Access: [https://www.gov.ca.gov/docs/2016\\_ZEV\\_Action\\_Plan.pdf](https://www.gov.ca.gov/docs/2016_ZEV_Action_Plan.pdf)

<sup>16</sup> CPUC, R.13-11-007, Assigned Commissioner’s Ruling Regarding the Filing of the Transportation Electrification Applications Pursuant to Senate Bill 350, September 14, 2016, page 19.

<sup>17</sup> Examples include the San Francisco 2015 Climate Action Plan; May 2016; <https://media.flysfo.com/media/sfo/community-environment/2015-sfo-climate-action-plan.pdf>

<sup>18</sup> CSE recommends the following modification to the Preliminary Draft of Potential Regulatory Amendments to the LCFS, page 37: “Upon submittal to and approval by the Executive Officer of the operator’s written acknowledgment that it will not opt in and generate credits under this provision, the Airport Authority becomes eligible to eligible to generate the credits for the electricity and must meet the requirements set forth in section 95483(e)(1)(B) through (D).”

<sup>19</sup> British Broadcasting Company; EasyJet puts its weight behind plans for electric planes. Website Access: <http://www.bbc.com/news/business-41404039>

<sup>20</sup> Uber wants flying taxis to soar above Los Angeles by 2020, with help from NASA; Posted on November 8, 2017; Website Access: [https://www.digitaltrends.com/cars/uber-flying-taxi-los-angeles-nasa-news/?utm\\_source=sendgrid&utm\\_medium=email&utm\\_campaign=daily-brief](https://www.digitaltrends.com/cars/uber-flying-taxi-los-angeles-nasa-news/?utm_source=sendgrid&utm_medium=email&utm_campaign=daily-brief)

such, CARB may want to revise this category's name. In addition, CARB should provide further guidance on credit distribution processes in order to avoid confusion regarding opt-in/out rights.

### **III) Renewable Electricity (EVs and Hydrogen)**

**Very-Low-To-No Carbon Pathways.** CSE supports the proposed credit modifications that will increase credits for “[e]lectricity that is generated from 100 percent solar or wind supplied to electric vehicles” and “[h]ydrogen produced from: (1) reforming of biomethane, or (2) electrolysis powered by solar or wind electricity”.<sup>21</sup> CSE has stated the value of this approach before multiple agencies, including the CPUC<sup>22</sup> and Strategic Growth Council.<sup>23</sup> These provisions will encourage activities that leverage ultra-low carbon, ultra-high renewable energy pathways far below California's electricity mix average of 105.16 gCO<sub>2</sub> e/MJ, which will lay the foundation to expand deep decarbonization in the transportation sector. To strengthen transparency around use cases of this new provision, CARB should prioritize the release of anonymized, aggregated data showcasing the utilization of this pathway, which should be broken down by vehicle type.

**Co-location.** CSE agrees with comments provided by parties that solar installation will not always be co-located with vehicle charging,<sup>24</sup> which suggests that CARB may want to evaluate its current co-location provision. CSE agrees with CARB that technology and EV applications have changed<sup>25</sup> and attests that as the state's smart charging infrastructure continues to expand with further technology integration, the ability to identify a charging occurrence (away from home) in tandem with solar charging occurrences (at home) becomes highly likely. As such, CSE suggests that CARB evaluate providing some flexibility around the co-location provision. If CARB does provide such flexibility, CARB should ensure that its associated credit is adjusted according to known resistance factors (e.g., line loss<sup>26</sup> and other factors restricting electricity distribution in the connected transmission system circuit), which would suggest that credit from this revised provision would be less than those received from direct co-location.

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<sup>21</sup> *Preliminary Draft of Potential Regulatory Amendments, Page 82.*

<sup>22</sup> *Response of Center for Sustainable Energy to the application of Southern California Edison* (<https://energycenter.org/sites/default/files/docs/nav/policy/proposed/CSE-Response-to-SCE-SB-350.pdf>); *PG&E* (<https://energycenter.org/sites/default/files/docs/nav/policy/proposed/CSE-Response-to-PGE-SB-350.pdf>); and *San Diego Gas and Electric* (<https://energycenter.org/sites/default/files/docs/nav/policy/proposed/CSE-Response-to-SDGE-SB-350.pdf>)

<sup>23</sup> *CSE's Response to the Draft Scoping Guidelines for the Transformative Climate Communities Program* <http://energycenter.org/sites/default/files/docs/nav/policy/research-and-reports/Center-for-Sustainable-Energy-Response-to-the-TCCP-Scoping-Guidelines-FINAL-PDF.pdf>

<sup>24</sup> *Subject: Comments to CARB LCFS 2018 Amendments Pre-Rulemaking; Website Access:* [https://www.arb.ca.gov/fuels/lcfs/workshops/09052017\\_tesla.pdf](https://www.arb.ca.gov/fuels/lcfs/workshops/09052017_tesla.pdf)

<sup>25</sup> *Pre-Rulemaking Public Meeting to Discuss 2018 LCFS Preliminary Draft Regulatory Amendment Text, Presentation Slides; Page 67; Website Access:* [https://www.arb.ca.gov/fuels/lcfs/lcfs\\_meetings/110617presentation.pdf](https://www.arb.ca.gov/fuels/lcfs/lcfs_meetings/110617presentation.pdf)

<sup>26</sup> <https://www.eia.gov/tools/faqs/faq.php?id=105&t=3>

## IV) Smart Charging and Smart Electrolysis (Hydrogen)

CSE supports these two provisions, noting that CARB is still establishing their associated credits. To establish these credits, CSE strongly recommends the use of granular, transparent, and uniform data to guide their development.

**Granularity: Meter Read Intervals.** To ensure data granularity, CARB should require smart charging data in hourly read intervals. While essentially real-time meter reading is feasible, hourly-read intervals generally comport with state policies, including concepts as presented in both the EV charging infrastructure and TE applications filed by utilities. These applications have grappled with this issue while discussing (among other things) time-of-use (TOU) pricing signals, where CSE has noted that “coupling technology with targeted price signals that will adjust PEV power consumption in hourly increments optimizes the value of the increased electricity demand for both the PEV owner and the grid operator.”<sup>27</sup> That said, CARB could encourage technology and market competition by permitting parties with unique, real-time approaches (i.e., less than 1 hour) to smart charging to apply for tier 2 pathways consideration with the Transportation Fuels Branch on a case-by-case basis. At minimum, this approach would allow for motivated stakeholders to educate CARB on potential routes of future LCFS Regulation modification to the smart charging provisions. The same provision should apply equally to hydrogen.

**Granularity: Regionalizing GHG emissions.** To strengthen data granularity consistent with different and localized GHG emissions characteristics, CARB should consider “regionalizing” the hourly GHG emissions profile measurements. While CAISO’s daily renewables output data<sup>28</sup> provides solid hourly measurements and insight into renewable energy usage patterns, this data appears to be aggregated at the state level, which (if true) would prevent insight into regional GHG emissions profiles for each utility service territory. To address this, CARB should evaluate the use of data that can provide a regionalized utility perspective (e.g., Utility Annual Power Content Labels<sup>29</sup> or other regional data sources), which can serve as a proxy for region-specific GHG emission profiling.

**Transparency.** To educate stakeholders and create comparative statistics, CARB should create a stakeholder database that identifies entities that leverage smart charging and smart electrolysis credits. This database should be akin to the “LRT Registered Parties” database<sup>30</sup> and should

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<sup>27</sup> CPUC, A.14-04-014, *Response of The California Center for Sustainable Energy to the Application of San Diego Gas & Electric Company (U 902-E) For Authority to Implement a Pilot Program for Electric Vehicle-Grid Integration*, Filed May 12, 2014

<sup>28</sup>As discussed in slide <http://www.caiso.com/market/Pages/ReportsBulletins/DailyRenewablesWatch.aspx#ghgreport>

<sup>29</sup> <http://www.energy.ca.gov/pcl/labels/>

<sup>30</sup> LCFS Regulated Parties Reporting: <https://www.arb.ca.gov/fuels/lcfs/regulatedpartiesreporting20171031.xlsx>

contain anonymized and aggregated data including Kilowatt hours, session data, and other indicators of load profile data (hourly), which will be valuable in assessing use patterns under this provision.

**Uniformity.** To encourage smart charging across all TE modes, CARB should consider extending these credit provisions uniformly, across all systems that are consistent with the statutory definition of TE.<sup>31</sup> In addition, to encourage cross-collaboration and uniformity with existing state programs with complementary smart charging offerings, CARB should consider making access to these additional smart charging credits contingent on proof of application/enrollment in complementary smart charging programs. Example smart charging programs include the utility demand response programs,<sup>32</sup> PEV sub-metering programs,<sup>33</sup> the Energy Commission's Block Grant for Electric Vehicle Charger Incentive Project,<sup>34</sup> CARB's Clean Mobility Options in DACs Pilot Project, and the Strategic Growth Council's Transformative Climate Communities Program.<sup>35</sup>

## V) Renewable Propane

**Renewable Propane as a School Fleets Solution.** CSE notes that SB 350 accommodates both zero and near-zero emission transportation technology options.<sup>36</sup> Regarding near-zero technologies, CSE supports the new renewable propane provisions, which will be especially valuable for school bus fleets. Propane has been a part of mainstream school bus fleet management for many years because of its reliability and low-capital costs and is today used by both large and small fleets across California. As noted by the Energy Commission, interest in propane as a transportation fuel is increasing once again due to its domestic availability, low costs, and clean burning qualities.<sup>37</sup>

Fleets that use conventional propane in place of diesel reduce their emissions of EPA Criteria Pollutants but not GHGs. Renewable propane reduces both types of emissions--benefiting the

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<sup>31</sup> See Reference 2.

<sup>32</sup> <http://www.cpuc.ca.gov/General.aspx?id=5925>

<sup>33</sup> <http://www.cpuc.ca.gov/General.aspx?id=5938>

<sup>34</sup> <http://www.energy.ca.gov/altfuels/zev/2017-EVI-01/>

<sup>35</sup> *Transformative Climate Communities Program Final Guidelines (Revised to Include Technical Amendments)*, October 2017; Page 19; Website Access: [http://sgc.ca.gov/resource%20files/10242017-TCC\\_FINAL\\_GUIDELINES\\_10\\_23\\_17.pdf](http://sgc.ca.gov/resource%20files/10242017-TCC_FINAL_GUIDELINES_10_23_17.pdf). Notably this program prioritizes the deployment of smart-grid technologies.

<sup>36</sup> Per SB 350, Section 740.12 (C) of Public Utility Code States: "[W]idespread transportation electrification requires increased access for disadvantaged communities, low- and moderate-income communities, and other consumers of zero-emission and near-zero-emission vehicles, and increased use of those vehicles in those communities and by other consumers to enhance air quality, lower greenhouse gases emissions, and promote overall benefits to those communities and other consumers.

<sup>37</sup> *Energy Commission, Propane Vehicles*; Website Access: <http://www.energy.ca.gov/drive/technology/propane.html>

health of pupils while also contributing to the state's GHG reduction goals. The amended LCFS Regulation will support renewable propane deployment and provide a crucial tool in support of GHG emission reduction for fleets.

## ***Conclusion***

CSE appreciates the opportunity to provide these comments to CARB regarding the amended LCFS Regulation under consideration. Please continue to consider CSE a resource on these and other matters. Please feel free to contact Paul D. Hernandez, CSE's Sustainable Transportation Infrastructure Policy Manager to clarify these comments or with any questions you may have.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "Paul D. Hernandez". The signature is fluid and cursive, with a large, sweeping flourish at the end.

Paul D. Hernandez  
Sustainable Transportation Infrastructure Policy Manager  
Center for Sustainable Energy®  
[paul.hernandez@energycenter.org](mailto:paul.hernandez@energycenter.org)