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HUMAN + NATURE

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Attorney Client Communication

November 5, 2020

Air Resources Board
1001 I Street
Sacramento, CA 95812
LCFSWorkshop@arb.ca.gov
[Submitted via electronic feedback portal]

RE: ***Low Carbon Fuel Standard Public Workshop to Discuss Potential Regulation Revisions***

To Whom It May Concern:

POET, LLC ("POET") appreciates this opportunity to comment on the Low Carbon Fuel Standard ("LCFS") workshops on October 14 and 15, 2020 ("Workshops") and the potential revised LCFS regulations (the "Potential Regulations"). POET is the world's largest biofuels producer currently operating twenty-eight biorefineries across the Midwest capable of producing almost 2.1 billion gallons of starch and cellulosic ethanol. POET is deeply committed to decarbonizing transportation and developing cleaner, affordable alternatives to fossil fuels in California and across the United States.

As outlined below, biofuels will continue to provide a crucial means for achieving the LCFS's carbon-intensity ("CI") reduction goals. Conventional ethanol has and continues to generate substantial credits under the LCFS program for its GHG-reduction value, while simultaneously reducing other harmful air pollutants, such as BTEX compounds and $PM_{2.5}$. As explained more fully below, we recommend that the California Air Resources Board ("CARB") address the following features of the LCFS program in the Potential Regulations to maximize, incentivize, and accurately account for the CI reductions that ethanol does (and can in the future) contribute to the program:

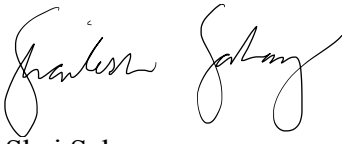
- Incentivize sustainable, lower-carbon farming practices through providing regulatory recognition of the benefits of low-CI feedstocks;
- Update the CA GREET model to reflect best-available science on land use change and make other GREET updates to (a) allow user-defined process chemical usage for ethanol pathways and (b) add electricity accounting of drying systems;
- Remove regulatory barriers related to the use of low-CI process energy;
- Ensure CO_2 generated in the ethanol fermentation process that is sold for use in the food beverage and other industries is not supplanted by extracted CO_2; and

- Clarify the definition of CCS Operators to delineate responsibilities where the CO_2 capture facility and the geologic sequestration site are controlled by separate entities.

Finally, as a procedural matter, we strongly encourage CARB to move forward with the Proposed Regulations as expeditiously as possible and conduct a separate rulemaking to address post-2030 regulatory amendments. Near-term regulatory revisions and certainty are needed on the items above as well as others the Potential Regulations will address. These revisions will maximize the GHG reduction potential of the LCFS, in line with CARB's goals. Performing two separate rulemakings will leave ample lead-time for compliance planning for the post-2030 LCFS requirements, as addressed further below.

We appreciate CARB's consideration of these comments and look forward to engaging in a productive dialogue with the Agency on the Potential Regulations and the role biofuels play in helping California achieve its GHG reduction goals. If you have any questions, please contact me at Shailesh.Sahay@POET.com or 202.756.5604.

Sincerely,



Shai Sahay
Senior Regulatory Counsel, POET, LLC

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I. Incentivize Sustainable, Low Carbon Farming Practices

We appreciate the opportunity at the Workshops to present the innovative work Gradable has done to demonstrate the meaningful GHG emissions benefits associated with changes in agricultural practices. The LCFS is well-positioned to galvanize innovative farming strategies across the United States by incentivizing the use of lower CI feedstocks for ethanol and other biofuels. This is a significant opportunity for the program to drive down agricultural GHG emissions through existing strategies such as better tillage practices, and nitrogen and biodiversity management that are not yet mainstream, as well as encourage a new wave of innovations in sustainable farming.

By way of example, Gradable's trial involving area farms supplying corn to POET's Chancellor plant resulted in a considerable, *25 percent* reduction in GHG emissions from corn cultivation and farm energy use compared to the assumptions embedded in CA-GREET. This means that CI values for at least some corn starch ethanol may be artificially high, distorting CI markets and incentives. Further, the results indicate a wide disparity between farming practices and CI (with a delta of about 31 g/MJ) between low and high CI farms in the same region providing corn to the same ethanol plant. This disparity suggests that widespread adoption of

low CI farming practices could readily result in CI reductions if farmers had the incentive to engage in such practices. The prospect of extrapolating these lessons to the entire industry is worthy of CARB's focus in this rulemaking process, particularly given how readily the existing regulatory framework could incorporate incentives for farmers to transition to more sustainable practices.

In particular, we encourage CARB to propose regulations to facilitate use of a Tier 2 pathway for "identity-preserved" feedstocks, i.e., those used by renewable fuel producers because of their verifiably lower CI characteristics. Regulatory amendments to the following provisions would be helpful to provide greater regulatory certainty regarding the LCFS' recognition of the value of innovative, lower CI farming practices:

- 17 C.C.R. § 95488.1(d)(7) - *Tier 2 pathway requirements*: To identify use of identity-preserved feedstocks as an innovative production method.
- 17 C.C.R. § 95488.7(a)(2) - *Tier 2 pathway registration requirements*: To address requirements specific to how a lifecycle analysis report should reflect low-CI feedstocks that may be subject to fluctuation year-to-year.
- 17 C.C.R. § 95488.7(d) - *Certification for Tier 2 pathways*: To address steps CARB must take for certification of a Tier 2 pathway that relies on low-CI feedstocks for the calculated CI score.
- 17 C.C.R. § 95488.8(g) - *Specified Source Feedstocks*: To include low-CI feedstocks as an enumerated specified source feedstock and to address requirements applicable to a producers' use of low-CI feedstocks, e.g., feedstock transfer documents.
- 17 C.C.R. § 95500 - *Verification*: To include applicable verification requirements. Verification of CI reductions associated with innovative farming practices is important both for the pathway holder/renewable fuel producer and CARB. The biofuel producer must be able to substantiate all inputs into the fuel's CI score and must have arrangements in place to ensure the practices undergirding the CI score associated with the feedstock are followed. The agency could build upon the LCFS's existing verification requirements through use of audits and farming data analytics (or other available data) to ensure the verification step appropriately extends to the feedstock level.

As may be helpful, we would be pleased to offer specific suggested regulatory language to provide the necessary certainty to move forward with Gradable's initiative on a larger scale.

Additionally, as some commenters on the Workshops have appropriately observed, the concepts of cherry-picking, feedstock shuffling, and baseline establishment require careful consideration. POET agrees that safeguards related to these topics need to be thoughtfully designed. However, we also believe that some of the commenters' assertions do not adequately acknowledge that the LCFS has well-established precedent to address each of these areas, and that prior mitigation approaches devised by CARB have been effective over time and have evolved with the science and technology to track them. Some of the commenters' arguments are addressed in turn as follows:

- **Baseline:** At the onset of the LCFS, most pathway holders used default calculations determined by CARB, even though the actual CI's of the various fuel pathways could be materially different. Over the next six years, the regulations evolved to the point where the original Method 1 and 2A/2B pathways sunset, and now most pathways are facility/process specific. While today's approach is much more desirable in yielding a precise CI calculation, it would have been impractical for CARB to start there in 2010 and POET believes the same holds true for identity-preserved feedstocks. Over time, the science and modeling will support a more granular assignment of values for baseline feedstocks and it would be expected that the LCFS adopt those values consistently for all pathway holders as appropriate.

- **Grain shuffling:** From the initial commentary around the adoption of the LCFS, the concept of shuffling has been contentious. However, from the onset, CARB has taken the approach of not letting perfection be the enemy of the good, and for all the shuffling that may theoretically occur, there are countless more examples of genuine improvements in the CI of fuel pathways that have been made. Further, natural, practical, and economic constraints, such as logistical and cost concerns associated with shipping corn, limit the reach of any grain shuffling, and grain transportation emissions can be factored into CI scores in any event. Additionally, as more areas follow California's lead in adopting lower-emissions transportation fuels, there are fewer markets for the higher CI fuels to go. POET believes the same concept will hold true for agricultural feedstocks as well.

- **Cherry-picking:** The feedstock model that Farmer's Business Network proposed in the Workshop creates a structure to avoid cherry-picking. Arguments regarding cherry-picking were made in the early days of the LCFS, arguing that many of the Method 2A pathways were not indicative of actual improvements that were made as a result of the LCFS. CARB nonetheless allowed individually tailored pathways to continue in parallel to default pathways because it believed that tailored CI scores would eventually incent real and durable changes in biofuels production that would result in GHG reductions. This is what has actually occurred in the marketplace.

  Moreover, while the potential for credit generation at full-scale adoption of the identity-preserved feedstock is significant, the reality is that it will take time for farmers and biofuel facilities to fully embrace the concept of identity preservation and third-party verification procedures. And, as they do in large scale, it will continue to drive regional and national averages of feedstocks lower, thus tempering the amount of credit generation over time. Therefore, fears of flooding the market with inexpensive credit values are unwarranted given the robust requirements for participation.

Finally, we expect that a number of commenters will encourage CARB to include assessments of soil organic carbon ("SOC") in farming-related CIs, and credit those farms that sequester carbon in the form of SOC. POET agrees that SOC is a potential tremendous reservoir to sequester CO_2 emissions. However, we also understand that some have pointed to technological challenges in measuring SOC and fluctuations in SOC over time. In the event CARB believes that SOC measurement methodologies are too unreliable to be currently accounted for in farming CI scores, POET strongly encourages CARB to allow for individually

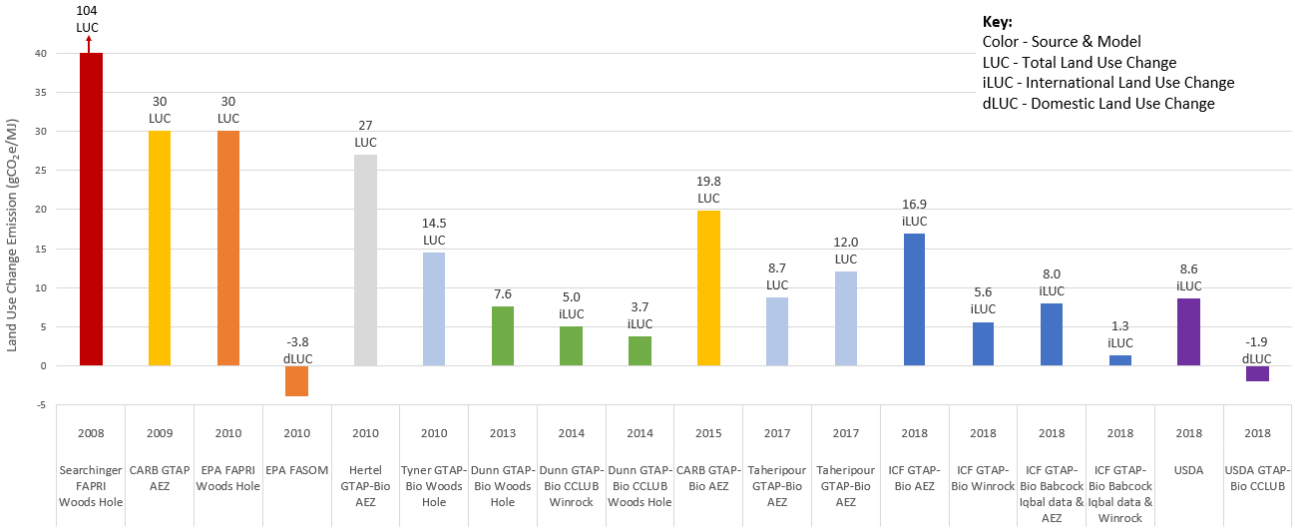
tailored farming CIs for other farming inputs (such as those discussed in the Gradable / FBN presentation) in its next rulemaking, and to return to the consideration of SOC at a later date.

II. Correct Scientific Inaccuracies Reflected in GREET's Current Indirect Land Use Change ("ILUC") Calculation and other GREET Updates

a. Land Use Change

Current scientific literature resoundingly indicates that the LCFS's 2019 iteration of GREET (CA_GREET3.0) overstates CI values for land use change for corn ethanol. While CA_GREET's model incorporates a LUC value of 19.8 gCO_2e/MJ, the best-available scientific literature supports far lower values of approximately 4 gCO_2e/MJ taking into account direct and indirect LUC, while some studies indicate biofuel production does not induce *any* ILUC.[1] Updating the technical tools that guide regulated parties' decision-making under the LCFS is critical to incentivize the production and use of lower-CI transportation fuel in California.

To explain further, since 2008, scientific assessments of LUC associated with ethanol production have changed substantially, with a consistent, downward trend in LUC carbon impacts (depiction below).[2]



[1] Kim S, Dale BE. 2011. *Indirect land use change for biofuels: Testing predictions and improving analytical methodologies*. BIOMASS AND BIOENERGY, 35(7):3235-3240. 10.1016/j.biombioe.2011.04.039; Kline KL, Oladosu GA, Dale VH, McBride AC. *Scientific analysis is essential to assess biofuel policy effects: In response to the paper by Kim and Dale on "Indirect land-use change for biofuels: Testing predictions and improving analytical methodologies"*. (10):4488-4491. 10.1016/j.biombioe.2011.08.011.

[2] Searchinger T, Heimlich R, Houghton RA, Dong F *et al., Use of U.S. croplands for biofuels increases greenhouse gases through emissions from land-use change*, SCIENCE, 319 (5867):1238-40. (2018) DOI 10.1126/science.1151861.

LUC estimates are now converging at substantially lower estimates than those established through CARB's prior analysis that culminated in the March 2015 Staff Report on ILUC values.[3]

Specifically, reliable analyses of LUC impacts generally draw from the GTAP agro-economic model, and have consistent approaches to the economic baseline year (2004), incorporation of yield price elasticity (of approximately .25), and, significantly, address the concept of land intensification.[4] The scientific literature supports that land intensification, *i.e.*, producing greater volume of a crop or multiple crops on existing land, is a key factor in appropriately assessing LUC. Studies indicate that during the period of significant increase in ethanol production in the United States from 2005 to 2012, both domestically and globally, the increase in harvested crop was due primarily to land intensification, rather than conversion of land to agricultural uses.[5] This critical model feature is not currently addressed in CA GREET3.0.

Accordingly, POET encourages CARB to reconvene a technical working group to incorporate the best-available science in its assessment of direct and indirect LUC. Failure to do so will result in the LCFS transmitting distort price signals that will not optimize CI reductions and could perversely incentivize higher CI behaviors and fuels.

b. User-defined Process Chemical Usage for Ethanol Pathways

POET recommends that CARB revisit the Tier 1 simplified calculator's treatment of process chemicals used in ethanol pathways. The current calculator does not allow the pathway applicant to specify use of low-CI process chemicals, which distorts the CI value of POET's ethanol. Specifically, POET's patented BPX process uses a less carbon-intensive group of chemicals than most ethanol producers. A simple change to the Tier 1 calculator to allow user-defined process chemical usage could cure this inaccuracy, and would be consistent with the calculator's accommodation of a variety of other user-defined inputs from denaturant to feedstock transportation distance. Of course, as with all CI inputs, verification requirements would apply to user-defined process chemical usage, allowing the verifier and CARB to ensure claimed CI reductions are accurate.

c. Distinguish Electricity Usage in Wet and Dry DDGS Pathways

Finally, we recommend a minor correction to the model's treatment of wet vs. dry DDGS produced at the same facility. Specifically, the current calculator distinguishes use of thermal energy between wet and dry DDGS pathways, but does not break out electricity usage. Electricity usage for production of wet DDGS is demonstrably lower than for dry DDGS.

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[3] https://ww2.arb.ca.gov/sites/default/files/classic//fuels/lcfs/peerreview/050515staffreport_ca-greet.pdf.

[4] *See e.g.*, Rosenfeld J, Lewandrowski J, Hendrickson T, Jaglo K et al., *A Life-Cycle Analysis of the Greenhouse Gas Emissions from Corn-Based Ethanol*., ICF (2018) (under USDA contract No. AG-3142-D-17-0161); Taheripour F, Zhao X, Tyner WE, *The impact of considering land intensification and updated data on biofuels land use change and emissions estimates*. BIOTECHNOL. BIOFUELS, (2017) DOI: 10:191. 10.1186/s13068-017-0877-y.

[5] Babcock BA, Iqbal Z, *Using Recent Land Use Changes to Validate Land Use Change Models,* CARD Staff Reports (2014); Taheripour F, Cui H, Tyner WE, *An Exploration of agricultural land use change at the intensive and extensive margins: implications for biofuels induced land use change*, BIOENERGY AND LAND USE CHANGE:19-37 (2017a).

Accordingly, we recommend electricity usage is distinguished between wet and dry pathways, consistent with thermal energy.

d. Energy Allocation to Non-Fuel Products

In response to the COVID-19 crisis, a number of ethanol producers have entered the market for non-fuel ethanol, and we expect the diversity of biorefined products to only increase over time. In many cases, the creation of alternate types of biorefined products, including technical grade ethanol, will require the utilization of additional processing steps and energy. We encourage CARB to ensure that future CA-GREET or other CI models do not allocate the energy used for non-fuel product production to biofuels. Doing so would inefficiently discourage biofuels producers from innovating in new markets whether they also supplant petroleum products in a manner that reduces net GHG emissions.

III. Remove Regulatory Barriers to Use of Low-CI Electricity

Current LCFS regulations prohibit use of indirect accounting mechanisms to demonstrate production of fuel using low-CI process energy. *See* 17 C.C.R. § 95488.8(h). Instead, the regulations require that renewable energy generation equipment "is directly connected through a dedicated line" to the fuel producer's facility. *Id.* § 95488.8(h)(1)(B). This is technically infeasible for many producers and stymies their use of low-CI electricity to produce lower-CI fuels. To drive growth in renewable energy generation and facilitate lower CI fuel production, we support CARB's removal of this regulatory barrier. In particular, we recommend the LCFS allow producers to demonstrate use of low-CI process energy through means such as power purchase agreements and book and claim accounting. Recognition of off-site renewable energy production as a means to reduce greenhouse gases is common in carbon markets, and CARB should use its authority to encourage more renewable energy use in the transportation supply chain (not just with respect to certain fuel types). This regulatory change would ensure efficient generation of low-CI energy through large-scale renewables projects that can take advantage of economies of scale and smart utilization of capital.

IV. Ensure Ethanol Fermentation CO_2 is Not Supplanted by Extracted CO_2

The LCFS currently provides a path for a variety of carbon capture and sequestration ("CCS") projects to generate credits under the program. Application of CCS at ethanol plants has been lauded by some as one of the lowest cost, commercial-ready sequestration opportunities.[6] This is in part due to the fact that many ethanol plants already capture CO_2 from the ethanol fermentation process for use in a variety of commercial products from food processing to beverage manufacture. In fact, POET is currently the fifth largest producer of commercial CO_2 in the country. While CCS is laudable, the fact that the LCFS currently recognizes sequestration but not other carbon capture projects may have unintended consequences. To the extent ethanol plants inject rather than market captured CO_2, CO_2 may

[6] *See, e.g.*, D. Sanchez et. al., *Near-term deployment of carbon capture and sequestration from biorefineries in the United States*, PROCEEDINGS OF THE NAT'L ACADEMY OF SCIENCES (2018), https://doi.org/10.1073/pnas.1719695115.

actually be derived from fossil sources or extracted from the earth to fill room in the marketplace. Sequestration of some CO_2, while other CO_2 is extracted to replace it, certainly does not benefit the aims of the LCFS.

To avoid this scenario, and to accurately capture the benefits of carbon capture and replace ("CCR") activities such as capture and use of fermentation CO_2 for commercial purposes, the Potential Regulations should take such processes into account in establishing a fuel's CI score. Indeed, the International Sustainability & Carbon Certification ("ISCC") system and Europe's Renewable Energy Directive ("RED") recognize the carbon reduction value of CCR.[7] A modest change to the GREET calculator could address this.

V. CCS Protocol Clarifications Related to CCS Operators

The LCFS's CCS Protocol contains detailed regulatory requirements in order for parties to generate LCFS credits from CCS projects. We understand that CARB is aware that given the nascency of this industry a variety of business arrangements may be contemplated between fuel producers, others that generate CO_2 emissions that may be sequestered, and entities with sequestration expertise. In particular, renewable fuel producers may desire to partner with a company with CCS expertise to ensure permanent sequestration of such emissions in conjunction with the fuel producer's generation of LCFS credits. In this scenario, it is clear under the LCFS regulations that only the "alternative fuel producer" may "receive CCS credits," 17 C.C.R. § 95490(a), but that both parties must "jointly" file a CCS project application, *id.*, § 95490(c).

The CCS Protocol, in turn, places a variety of regulatory requirements related to well and plume monitoring, recordkeeping, post-injection site care, etc., on a "CCS Operator" defined as "the operator responsible for the CCS project," where a "CCS project" is defined as "the overall CCS project operations, including *those of the CCS capture facility* and *geologic sequestration site and activities*." CCS Protocol at 9 (emphasis added). It would be helpful for CARB to clarify that where separate entities control (1) the CCS capture facility and (2) the sequestration facility and activities, the "CCS Operator" for purposes of the CCS Protocol's regulatory requirements is the party responsible for the geologic sequestration site and all related activities. This regulatory clarification is consistent with the responsibilities of the CCS Project Operator under the CCS Protocol (e.g., geologic site characterization, monitoring, operation of injection wells, post-injection site care and closure); whereas, the sole role of the fuel producer is to provide the CO_2 for injection.

VI. Rulemaking Timing Considerations

POET appreciates CARB soliciting input on timing considerations related to the Potential Regulations. Given the significance of the issues outlined above for the LCFS' short and medium-term success, we strongly support a rulemaking process that bifurcates these regulatory

[7] *See* ISCC 205, § 4.3.7 https://www.iscc-system.org/wp-content/uploads/2017/02/ISCC_205_GHG_Emissions_3.0.pdf; RED, Annev V (C)(15) ("Emission saving from carbon capture and replacement, e_{ccr}, shall be limited to emissions avoided through the capture of CO_2 of which the carbon originates from biomass and which is used to replace fossil-derived CO_2 used in commercial products and services.").

concerns from the post-2030 rulemaking to allow the former to proceed on a faster track. Specifically, we support an effective date of January 1, 2022 for the Potential Regulations if feasible. Given the California Office of Administrative Law's ("OAL") regulatory review process, to achieve an effective date of January 1, 2022, CARB must either (1) transmit the Potential Regulations to OAL no later than October 15, 2021, s*ee* Cal. Gov't Code §§ 11349.3(a) (providing OAL 30 working days for review); 11349.3(a) (providing that regulations filed from September 1 to November 30 generally become effective January 1 of the following year unless good cause necessitates earlier enactment), or (2) request an expedited effective date based on good cause. CARB should take one of these to routes to make these changes as quickly as possible. The regulatory changes discussed above will expedite behavior that could tremendously reduce GHG emissions on a national or even global scale. CARB should do everything in its power to unleash the potential of these GHG-reducing behaviors as soon as possible.

We realize this is an expeditious timeframe for developing the Proposed Regulations and taking comment, but POET believes the substance of the regulatory revisions merits the agency's close, immediate attention. Additionally, performing two separate rulemakings will leave ample lead-time for compliance planning for the post-2030 LCFS requirements.