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August 27, 2024

Clerk of the Board
California Air Resources Board
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Submitted electronically via: https://ww2.arb.ca.gov/applications/public-comments

RE: POET COMMENTS ON AUGUST 12, 2024, PROPOSED LOW CARBON FUEL STANDARD AMENDMENTS

Dear CARB Members:

POET appreciates the opportunity to provide comments on the California Air Resources Board's ("CARB") August 12, 2024, Proposed Low Carbon Fuel Standard ("LCFS") Amendments ("Revised Proposed Amendments"). POET has participated actively in CARB's ongoing rulemaking and submitted detailed comments on its own behalf and as part of a coalition on February 20, 2024, regarding the Amendments initially proposed in December 2023 ("Original Proposed Amendments"). POET also attended the LCFS rulemaking workshop held on April 10, 2024, and submitted written comments regarding the matters discussed and presented during the workshop.

As the global leader in biofuels and California's leading bioethanol supplier, POET has embraced the LCFS, seizing the program's incentives to lower the carbon intensity ("CI") of its fuel and delivering greenhouse gas ("GHG") reductions and public health benefits to the State of California. We write to express our continuing concerns with CARB's paradigm-shifting revisions, which will stifle innovation, eliminate paths to decarbonization, and mandate large-scale changes in the bioethanol supply chain without recognizing the carbon reductions that accompany CARB's mandate. CARB's proposal also threatens the technology-neutral principles that underlie the LCFS, and interposes costly burdens on biofuel production that will almost certainly raise the price of gasoline. Because the likely and practical consequences of CARB's proposals will be to drive lower-carbon bioethanol into other markets, CARB's proposed rule also undermines the primary objectives of the LCFS and of California's Global Warming Solutions Act ("AB 32").[1]

[1] California Global Warming Solutions Act, Cal. Health & Safety Code § 38500-38599.

The Revised Proposed Amendments would establish sustainability requirements applicable to biomass feedstocks, which include "all crop-based and forestry-based products used as feedstocks for finished fuel and/or process energy," that would be phased in beginning in 2026 through 2031.[2] Although some waste and residue feedstocks are not subject to the sustainability requirements, most biomass wastes types fall outside of this exemption.[3] Biomass subject to the sustainability requirements must "maintain continuous third-party sustainability certification under an Executive Officer approved certification system."[4] CARB will approve certification systems recognized by the European Commission for the European Union Renewable Energy Directive ("EURED") 2018/2001 as of December 1, 2025, and may approve other certification systems that meet specific criteria.[5] Certification systems must be resubmitted for approval every three years to ensure compliance with these criteria.[6] Under the Revised Proposed Amendments, CARB may determine that existing land use change ("LUC") values are not representative of a region, feedstock, or fuel and may assign a more conservative LUC value based on the best available empirical data.[7]

As articulated further below, POET urges CARB to refrain from adopting the sustainability requirements proposed in the August 12, 2024, revisions, and to instead address the issue of feedstock sustainability in a future rulemaking that also acknowledges and credits the carbon reductions associated with sustainable agricultural practices. POET also urges CARB to re-evaluate the treatment of proven waste feedstocks, like corn kernel fiber and corn stover, which are now excluded from the definition of "specified source feedstocks," and therefore unnecessarily subject to the same sustainability requirements as all other biomass. When reviewing and revising LUC values, CARB should undertake a rulemaking and provide an opportunity for public comment on the proposed revisions. CARB should lower the LUC values when supported by empirical data. CARB should also revise its proposed CA-GREET 4.0 model to include scientific advancements embodied in the latest version of Argonne National Laboratory's GREET Model, and to modify elements of the model that inadequately capture emissions in the biofuel lifecycle. Finally, CARB's Standardized Regulatory Impact Assessment[8] and Environmental Impact Analysis[9] do not address the sustainability requirements and potential costs associated with requiring certification.

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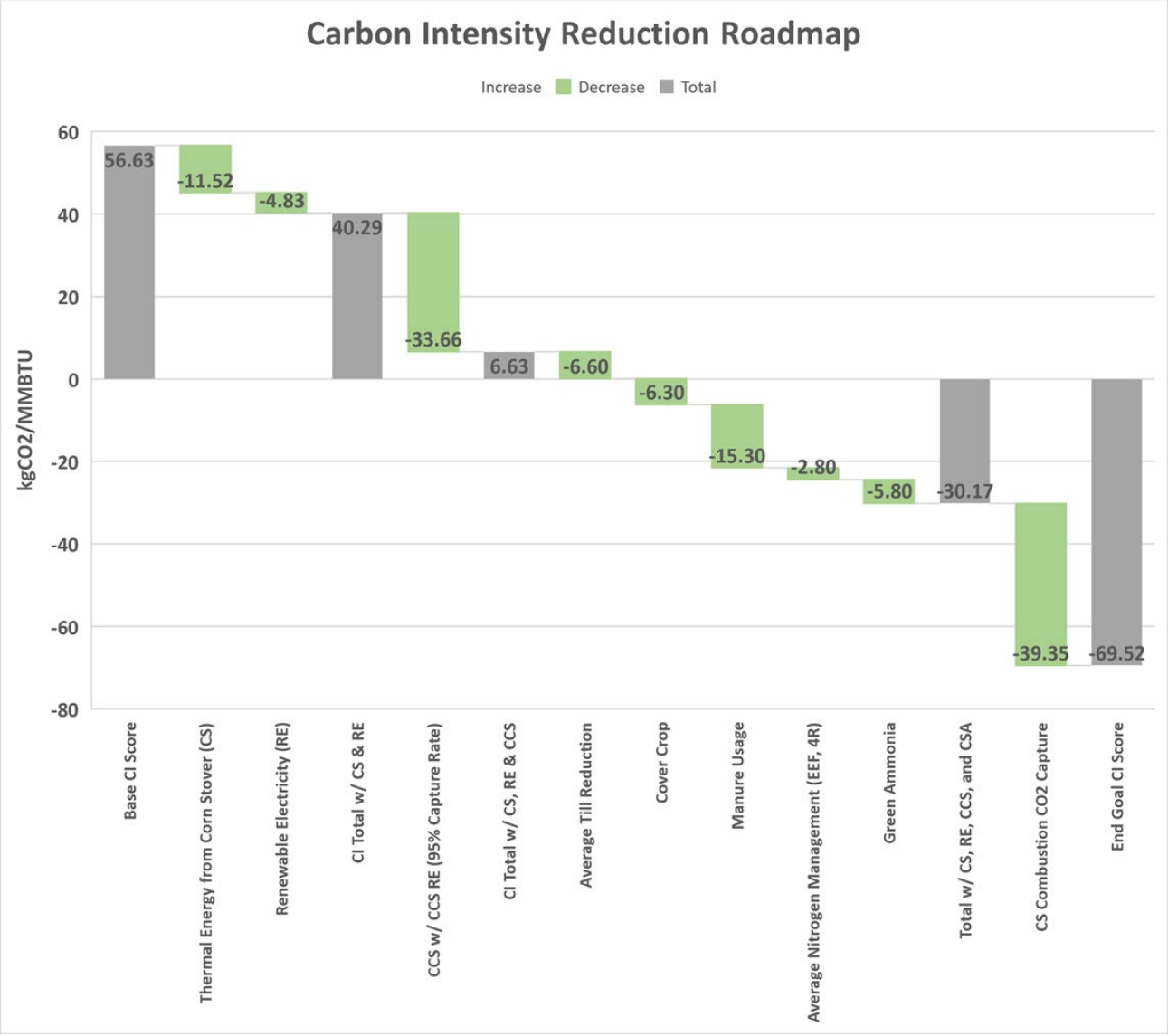
[2] CARB, *Attachment A-1.2, Proposed 15-Day Changes and 45-Day Changes Compared to the Current Regulation, Proposed Amendments to the Low Carbon Fuel Standard Regulation*, § 95488.9(g) (Aug. 12, 2024).
[3] *Id.* at § 95488.8(g)(1)(A).
[4] *Id.* at § 95488.9(g)(1).
[5] *Id.* at § 95488.9(g)(3)(C)(1); § 95488.9(g)(5).
[6] *Id.* at § 95488.9(g)(5)(G).
[7] *Id.* at § 95488.3(d)(2).
[8] CARB, *Appendix C-1 Standardized Regulatory Impact Assessment (SRIA), Proposed Amendments to the Low Carbon Fuel Standard Regulation* (Sept. 9, 2023), https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/appc-1.pdf.
[9] CARB, *Release of Recirculated Draft Environmental Impact Analysis for the Proposed Low Carbon Fuel Standard Regulation* (Aug. 16, 2024), https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/notice_recirc_drafteia.pdf.

I. CARB's Proposed Sustainability Requirements Eliminate Practical Paths to Decarbonization

Under the statutory mandate imposed by AB 32, CARB designed the LCFS "to achieve the maximum technologically feasible and cost-effective greenhouse gas emission reductions."[10] The LCFS program has operated to serve this statutory goal by evaluating the CI of transportation fuel on a lifecycle basis, recognizing that "greenhouse gas (GHG) emissions from all steps in the fuel's life cycle" must be assessed to understand the actual carbon impact of fuel production and consumption.[11] Using a version of Argonne National Laboratory's GREET[12] Model (the CA-GREET Model), the LCFS program has sought to measure the CI of specific fuel pathways based on the actual CI of developing fuel feedstocks, manufacturing finished fuel, transporting fuel to the marketplace, and consuming fuel on the road. Although POET has expressed and continues to hold disagreement with certain aspects of CARB's modeling approach, the CA-GREET Model together with the LCFS regulations have worked in tandem to reward carbon-reducing innovations. Over the years, the program has provided incentives that align with POET's long-term investments in renewable and lower carbon sources of process energy at its bioprocessing plants, carbon capture and sequestration projects, climate-smart agriculture ("CSA") programming and procurement, and the production of fuel from waste feedstocks like corn kernel fiber.

At present, and under Argonne's most recently updated research and development model ("R&D GREET 2023"),[13] POET sees the potential for producing deeply decarbonized liquid fuel that, if credited, would substantially advance California's LCFS program goals. The chart below, showing the R&D GREET 2023-modeled carbon reductions associated with practices that could be adopted at POET's bioprocessing facility in Emmetsburg, Iowa, including reductions associated with a range of CSA practices, demonstrates that POET could produce bioethanol with a *negative CI* — approximately -70kgCO_2/MMBTU.

[10] *Supra* note 1 at § 38560.
[11] CARB, CA-GREET3.0 Supplemental Document and Table of Changes, at 4 (Aug. 13, 2018), *https://ww2.arb.ca.gov/sites/default/files/classic/fuels/lcfs/ca-greet/cagreet_supp_doc_clean.pdf?_ga=2.264272271.1059097996.1724081758-380312612.1693496480*
[12] Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation GREET Model.
[13] Argonne National Laboratory, *Energy Systems and Infrastructure Analysis. R&D GREET Model* (Apr. 30, 2024), https://greet.anl.gov/index.php.



Unfortunately, CARB's proposed LCFS program revisions cut off several available paths to decarbonization demonstrated above. Indeed, other than bioethanol pathways incorporating carbon capture, which CARB has yet to approve for any biofuel producer and which remain years away from implementation for most producers, none of the practical decarbonization pathways shown above would be feasible under CARB's proffered changes. Rather, biofuels producers would be compelled to certify the sustainability of their feedstocks without earning credit for the well-recognized carbon reductions associated with the types of sustainable farming practices likely required for certification.

Furthermore, by subjecting recognized waste feedstocks like corn kernel fiber and corn stover to sustainability requirements CARB's proposal imposes unnecessary costs and eliminates the

economic value and incentive to harvest and convert these low-carbon wastes into fuel and process energy.

As concerns renewable electricity, it remains noteworthy that CARB's LCFS program continues to authorize indirect accounting only for hydrogen production, refusing to facilitate practical investments by biofuel and sustainable aviation fuel ("SAF") producers in additional renewable electricity sources that would drive down the CI of liquid fuel production.

POET urges CARB to reconsider and abandon these proposed program revisions, which will only operate to discourage decarbonization of biofuels and increase the cost of ethanol blended into California's transportation fuel supply.

II. CARB Should Credit Biofuels with CSA-Related CI Reductions That Can Be Verified Through the Sustainability Certification Process.

POET maintains the view, expressed in earlier comments, that corn grown in the United States is a low-risk feedstock that does not present the concerns workshopped, studied and discussed as part of the 2024 LCFS rulemaking process. Indeed, the guardrails already in place in California's program, including an extremely conservative indirect land use change ("ILUC") penalty of 19.8 g/MJ, and an overlay of rigorous state and federal environmental laws addressing impacts to air, water, land use and wildlife, appropriately account for any concerns regarding the sustainability of domestic corn ethanol. CARB's revised proposal, which fails to acknowledge more recent scientific studies regarding land use change and imposes on-farm certification requirements, places unnecessary burdens on biofuel production.

To the extent that CARB moves forward with the sustainability certifications it envisions, the program should recognize agricultural-related carbon reductions that will be verified by the third-party auditor programs CARB intends to mandate. Failing to do so simply ignores real and easily quantifiable carbon reductions, and will exacerbate the economic impacts and market disruptions likely to follow from CARB's proposed rules.

As we commented in connection with CARB's April 10, 2024 workshop, California's approach is at odds with the Biden Administration's Inflation Reduction Act ("IRA"), which incentivizes sustainability on the farm by offering tax incentives that will fund changes in how crops are planted, fertilized and cultivated.[14] Since April, the United States Department of Agriculture (USDA) has been working to further develop and potentially expand a program that would reward carbon reductions based on climate smart agricultural practices. POET's comment in response to

[14] Department of the Treasury and IRS, *Sustainable Aviation Fuel Credit; Lifecycle Greenhouse Gas Emissions Reduction Percentage and Certification of Requirements Related to the Clean Air Act; Climate Smart Agriculture; Safe Harbors, Notice 2024-37, at Section 4.01 (Apr. 30, 2024),* https://www.irs.gov/pub/irs-drop/n-24-37.pdf ("Notice 2024-37").

a recent USDA Request for Information on this IRA-related program addresses in detail how USDA and Treasury could account for CSA carbon reductions using precisely the same certification schemes and GREET-model tools available to California under the LCFS.

As noted in our comments to USDA, by leveraging the GREET FD-CIC and the Century/DayCent models,[15] CARB could calculate inputs including corn yield, fertilizer and chemical application rates, and agronomic practices. The FD-CIC includes a lookup table based on a version of the Century/DayCent model that quantifies the soil organic carbon impacts of agronomic practices including cover crop, manure application, and tillage. The Century/DayCent model was developed "to simulate changes in soil organic matter ("SOM"), plant productivity, nutrient availability, and other ecosystem parameters in response to changes in land management and climate."[16] Additional required model inputs include "soil texture, current and historical land use, and daily maximum and minimum temperature and precipitation data."[17]

All of the underlying data necessary to compute these modeled carbon impacts could be collected and certified using the same verifications schemes, like the International Sustainability and Carbon Certification program ("ISCC") referenced in CARB's proposal.

III. CARB Should Exclude From its Proposed Sustainability Requirements Recognized Agricultural Wastes Like Corn Stover and Corn Kernel Fiber

CARB's proposed revisions exclude certain wastes defined as "Specified Source Feedstocks" from the sustainability certifications otherwise imposed by proposed Section 95488.9(g).[18] Corn stover and corn kernel fiber are not on that list. Although specified source feedstocks must satisfy certain chain of custody requirements under CARB's proposal, these wastes, including used cooking oil and other fat and grease byproducts of commercial and industrial processes need not satisfy the more onerous sustainability requirements imposed for all agricultural feedstocks, including well-established and long recognized wastes. Indeed, the proposed rules make clear in proposed §§ 95488.6(a)(3) and 95488.7(a)(4) that Tier 1 and Tier 2 fuel "pathways utilizing biomass feedstocks or process energy must meet the sustainability requirements of section 95488.9(g)."[19]

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[15] *DayCent Ecosystem Model. The Daily Century Ecosystem, Soil Organic Matter, Nutrient Cycling, Nitrogen Trace Gas, and Methane Model. User Manual, Scientific Basis, and Technical Documentation*, Nat. Res. Ecology Lab'y, Colo. State Univ. (2018), https://www.nrel.colostate.edu/wp-content/uploads/2019/04/DayCent_Manual_full_05.02.108-1.pdf.

[16] *Id.* at 11.

[17] *Id.*

[18] *See* CARB, *Attachment A-1: Proposed 15-Day Changes Proposed Amendments to the Low Carbon Fuel Standard Regulation*, at § 95488.8(g)(1)(A) (Aug. 12, 2024), https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/15day_atta-1.pdf.

[19] *Id.* at § 95488.6(a)(3).

This proposed treatment of agricultural wastes is unnecessary and uneven compared to the proposed handling of other types of waste feedstocks under the LCFS. Furthermore, it is unclear what policy goal is served by requiring that biomass waste that would otherwise be discarded, or in the case of corn stover, left to decompose on the field, be grown and harvested in accordance with particular standards – standards that do not apply to the industrial and commercial operations generating other waste feedstocks. As a practical matter, the rule is likely to result in adverse consequences for CARB's LCFS program.

POET and other biofuel producers now co-process corn kernel fiber into lower-CI cellulosic bioethanol. The lower-CI crediting associated with cellulosic fuel production provides the economic incentives necessary for producers to ship that fuel type to California from midwestern bioprocessing facilities. Under the new rules, which will require producers to pay premiums for conforming feedstocks, the economics of those transactions will change significantly and will likely cause producers to seek other markets for cellulosic bioethanol.

Requiring sustainability certifications for corn stover used as process energy effectively eliminates one of the few practical options biofuel producers have for reducing the CI of their manufacturing operations. At present, POET's Project Freedom at its facility in Emmetsburg, Iowa combusts corn stover to provide heat used in our bioethanol production process. POET works with farmers to collect otherwise unused corn stover from the field and has developed a solid fuel boiler to convert stover into steam. Combusting biomass as process energy will reduce the facility's reliance on natural gas by up to 65%. POET is also exploring the possibility of capturing and sequestering the biogenic CO_2 associated with combusting corn stover, removing carbon that would otherwise have entered the atmosphere through decomposition. CARB should encourage and not erect barriers to prevent this innovative use of agricultural waste material to lower the CI of bioethanol production. Any concerns related to the sustainability of harvesting corn stover can be satisfied by simply requiring limits on the amount of stover removed from the field. CARB has reasonably imposed such limits in the past, approving a corn stover-related fuel pathway that allows for the collection of corn stover "not to exceed 50% by mass per harvested acre."[20]

Should CARB add agricultural wastes and residues to the list of Specified Source Feedstocks, CARB should also simplify the required chain of custody evidence and attestation requirements for such feedstocks, which appear to be focused primarily on the specter of fraud in markets for waste fats, oils and greases. In particular, because corn kernel fiber is co-processed with corn starch CARB should not require attestations that agricultural wastes, like corn kernel fiber, are "not mixed with any other materials that do not meet the definition of the specified source feedstock."[21]

[20] *See* CARB Staff Summary, Application for Certification of Corn Ethanol/Dry Mill/with Residue Co-Products Credit LCFS Pathway, Dec. 30, 2015 (attached as Exhibit 1).
[21] *Supra* note 2 at § 95488.8(g)(1)(D)(3)(e).

IV. The Revised Proposed Amendments Still Allow Foreign, Non-Governmental Entities to Place Requirements on American Fuel Producers, in Violation of California Law.

In the Revised Proposed Amendments, CARB has added language to provide at least some indication of what it believes "sustainability" means. In addition to clarifying its proposed requirement that land on which biomass is grown must have been "cleared or cultivated" prior to January 1, 2008, CARB has provided a non-exclusive list of "best environmental management practices that reduce GHG emissions or increase GHG sequestration[.]"[22] CARB requires that biomass be produced according to these practices in order to avoid a CI scoring penalty starting in 2031, but also allows third party sustainability certification schemes to require that these practices be used as early as 2028.[23] These practices are:

- maintain/enhance biodiversity habitat;
- enhance soil fertility and avoid soil erosion/compaction;
- minimize fertilizer runoff and soil/water contamination; and
- reduce unsustainable water use, minimize diffuse and localized pollution from chemical residues, fertilizers, soil erosion or other sources of ground and surface water contamination.

Unfortunately, CARB does not provide any further details regarding the standards CARB will apply to measure these vague and potentially wide-reaching requirements. In the United States, entire statutory and regulatory frameworks have been established to meet these ends. For example, the Endangered Species Act and its regulations[24] are part of the American system to protect biodiversity, the Clean Water Act[25] addresses discharges of fertilizer and other pollutants to waters of the United States, and the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA")[26] and Resource Conservation and Recovery Act ("RCRA")[27] are part of the American regulatory system that protects soil.[28]

Instead of attempting to tackle the incredibly complex legal, policy, technical, and socioeconomic issues that come with creating nationally applicable requirements relating to biodiversity, soil, and water protection, CARB leaves it completely up to third-party certification systems to define and then apply these concepts. This is consequential because the requirements have significant legal and economic impacts on biofuel producers. If the requirements are not met, biofuel producers do

[22] *Id.* at § 95488.9(g)(1)(B).
[23] *Id.* at § 95488.9(g)(3)(C)(3).
[24] Endangered Species Act, 16 U.S.C. §§1531-1544.
[25] Clean Water Act, 33 U.S.C. §§ 1251 *et seq*.
[26] Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. §§9601-9675.
[27] Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901 *et seq.*
[28] These and other federal laws may preempt CARB's attempts to regulate in these areas.

not receive any credit for CI reduction practices, and are treated exactly as fossil fuel producers no matter how environmentally friendly the biofuel production process.

Further, the Revised Proposed Amendments allow these certification systems to go above and beyond CARB's broad notions of sustainability. CARB does not require merely a demonstration of the sustainability requirements in its regulations in order for biofuels to avoid a CI penalty. It requires "continuous third-party sustainability certification" in addition to meeting the CARB-defined sustainability requirements.[29] In practice, sustainability certification systems often layer requirements on top of regulatory programs. For example, ISCC EU imposes additional ecological and social requirements that go beyond EURED. ISCC EU includes six principles, and only one of these principles covers the legal requirements under EURED.[30] The remaining principles go beyond EURED requirements and include compliance with safe working conditions, human and labor rights, and responsible community relations.[31] CARB has no control over what these requirements might be. Yet biofuel producers would have to meet all of these extraneous requirements in order to sell into the California market with CIs that reflect actual emissions. CARB's phased-in approach to its sustainability requirements might in fact be completely undermined due to this regulatory feature; CARB explicitly allows for sustainability systems to apply the full sustainability requirements starting in 2028 rather than 2031.[32] These concerns are underscored by the fact that CARB requires certification systems to "consider environmental, social, and economic criteria[,]"[33] but provides no contours as to what this consideration should consist of. As discussed in POET's prior comment letter, the delegation of these complex regulatory responsibilities to third parties violates the California Administrative Procedure Act, non-delegation law, and other legal principles.

CARB also forecloses the creation of new sustainability certification systems that could be tailored to meet CARB's requirements. CARB will only approve certification systems that have been recognized by other governmental bodies for at least 24 months, and meet a host of other onerous requirements.[34] These requirements for sustainability certification systems depart significantly from how CARB verifies all the other elements of CI, where verification systems center around the requirements established by CARB itself and the regulations allow new entities that can meet CARB's requirements to qualify as verification systems.[35] Under the sustainability regulations, existing, foreign sustainability certification schemes will be able to establish whatever

[29] *Supra* note 2 at § 95488.9(g)(1).
[30] ISCC, *The Six ISCC Principles*, (last visited Aug. 25, 2024) https://www.iscc-system.org/about/sustainability/iscc-principles/; *ISCC EU 201 System Basics* at 20 (2023), https://www.iscc-system.org/wp-content/uploads/2024/01/ISCC_EU_201_System_Basics_4.1_January2024.pdf.
[31] *ISCC EU 201 System Basics* at 20 (2023), https://www.iscc-system.org/wp-content/uploads/2024/01/ISCC_EU_201_System_Basics_4.1_January2024.pdf.
[32] *Supra* note 2 at § 95488.9(g)(3)(C)(3).
[33] *Id.* at § 95488.9(g)(5)(A)(2).
[34] *Id.* at § 95488.9(g)(5).
[35] *Id.* at § 955501 (b)-(c); *id.* at § 95502(a).

requirements they choose, and biofuel producers will have to meet these as-yet-unknown requirements in order to be able to sell into California. And these sustainability schemes will face no competition from more narrowly tailored systems.

V. If CARB Moves Forward with the Sustainability Requirements, it Must Allow for an Intra-Company Mass Balancing Approach.

The Revised Proposed Amendments require entities to maintain certificates "identifying the exact volume...of biomass" beginning in 2028.[36] These certificates must accompany the sustainable biomass from the Feedstock First Gathering Point to the fuel producer. The certificates must be available to verification entities and "must be reviewed along with chain-of-custody evidence for sustainable biomass."[37] In tracking sustainability requirements, CARB should allow mass balancing within entities. Tracking individual kernels of corn through the supply chain is not feasible. Mass balancing would allow for the most efficient application of sustainable farming practices.

While many sustainability requirements established by ISCC may not be appropriate for the LCFS, CARB should adopt features of the ISCC's requirements concerning mass balancing to the extent it retains sustainability certification requirements. Under the ISCC approach, a producer must maintain detailed records as to the volume of material being received along with the sustainability characteristics (*e.g.*, CI score) of that volume of material during a period of time (mass balance period). If a producer receives multiple batches of materials with variable sustainability characteristics, the mass balance framework allows a producer to calculate the allocation of sustainability characteristics applied to the producer's total output. The mass balance framework is critical to biofuel, because it allows for batches of sustainable material with different sustainability characteristics to be mixed, while still allowing chain-of-custody verification and transparency.

The ISCC PLUS program provides for "credit transfer" options within the mass balance chain-of-custody verification. Under this system, if more sustainable material is received at the processing unit than processed into fuel and sold or transferred within a mass balance period, the surplus of sustainable material generates a credit. For biofuel processers, credits achieved within one site's mass balance can be transferred to another site as long as the sites are within the same company, corporate group, or joint venture and the output product is the same, among other requirements. The ISCC implemented these credit transfer provisions to incentivize sustainable practices anywhere within a nation or adjoining nations and reduce additional GHG emissions by avoiding the unnecessary shipping of sustainable materials between sites. It is also effective at allowing

[36] *Supra* note 2 at § 95488.9(g)(3)(A)(2) & § 95488.9(g)(3)(B)(2).
[37] *Id.* § 95501(b)(4)(F).

greater farmer participation in the program, especially in areas that may not be in the immediate proximity of a biofuel production facility.

A credit transfer model within the same parent entity could operate similarly in the LCFS. In the case of the LCFS program, a surplus would occur when the ratio of certified to uncertified biomass exceeds the ratio of unpenalized fuel being shipped to California to other fuel being produced at a biofuel facility. Such an approach would allow a company to transfer sustainability certifications associated with low-carbon farming practices from one entity within an organization to another. Such an approach would allow the company to continue to optimize supply chains while still providing nationwide incentives for sustainable farming practices wherever they are most efficiently implemented. By adopting a traceability system of mass-balance accounting, unnecessary emissions from transportation and shipping are negated, further reducing GHG emissions and allowing sustainable farming practices to be implemented in the geographies best suited to such practices.

VI. CARB May Not Revise LUC Values for Corn Ethanol Without Notice-And-Comment Rulemaking.

The Revised Proposed Amendments would allow the Executive Officer to "determine that no [LUC] value in Table 6 is conservatively representative of a particular region/feedstock/fuel combination and assign a more conservative LUC value."[38] This determination must be based on "the best available empirical data, including but not limited to satellite-based remote sensing data for land cover monitoring, crop yields, and emission factors from the AEZ-EF model or carbon stock datasets."[39] Additionally, the Revised Proposed Amendments state that for "feedstocks not listed in Table 6, the Executive Officer may determine and assign an appropriate LUC value based on empirical land cover data, crop yields, and emission factors."[40] To the extent CARB modifies or adopts new LUC values, CARB should undertake a rulemaking to solicit the best available data and determine the appropriate LUC value. If supported by the best available empirical data, CARB should lower LUC values.

CARB's modification of existing or establishment of new LUC values are regulations under the California APA, and CARB should hold a 45-day comment period when undertaking these actions. Under the California APA, state agencies may not issue or enforce "a regulation without complying with public comment and hearing requirements.[41] The California Supreme Court interpreted "regulation" under the APA to include agency actions "intend[ed]...to apply generally[.]"[42] LUC

[38] *Supra* note 2 at § 95488.3(d)(2).
[39] *Id*.
[40] *Id*.
[41] Cal. Gov't Code § 11340.5(a), § 11346.8(a).
[42] *Alvarado v. Dart Container Corp. of California*, 411 P.3d 528, 534-35 (Cal. 2018) (holding that an agency manual was a regulation because it was intended to influence present and future employers' behavior and was void

values for specific feedstocks apply generally to all pathway holders producing fuel from that feedstock, affecting that fuel's CI score. As required under the APA for generally applicable standards, CARB should undertake a rulemaking when modifying or establishing LUC values to provide the public an opportunity to comment on the proposed changes.

VII. LUC Values Assigned to Feedstocks Are Duplicative in Light of Sustainability Requirements.

The proposed sustainability requirements render the LUC values duplicative. The Revised Proposed Amendments require biomass to be "sourced on land that was cleared or cultivated prior to January 1, 2008, and actively managed or fallow, and non-forested since January 1, 2008."[43] It also requires the best environmental management practices described above, and whatever additional requirements are imposed by certification systems. If CARB requires biomass to meet these sustainability requirements, CARB should no longer assign a LUC value because LUC concerns will be addressed through these other mechanisms. As discussed in POET's prior comment letter, this is the approach taken by the EU, where uncertainty in LUC values led the EU to establish alternative sustainability requirements.

VIII. The EIA and SRIA Still do not Adequately Analyze the Impacts of the Sustainability Standard.

CARB issued a revised Environmental Impact Analysis ("Revised EIA") as part of the Revised Proposed Amendments.[44] However, this Revised EIA does not address impacts associated with the sustainability requirements. CARB must analyze these impacts. Complying with sustainability certification requirements would impose a significant cost on biofuel producers, as described in POET's prior comment letter. Based on POET's experience with ISCC Plus and ISCC EU, farmers require significant premiums to comply with sustainability requirements. If biofuel producers provide a premium to farmers to comply with sustainability criteria without receiving CI benefits from emissions reductions associated with sustainable farming practices, this cost will likely be passed down to the consumer resulting in increased gasoline prices. Alternatively, the added costs would lead to an increase in ethanol price, which could decrease the amount of ethanol used in California. This would in turn increase particulate matter and other forms of pollution in the state, as detailed in POET's prior letter. The Revised EIA does not attempt to address any of these issues, meaning that it continues to be fundamentally flawed.

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because it was not adopted in accordance with the APA) citing *Tidewater Marine W., Inc. v. Bradshaw*, 927 P.2d 296, 304-305 (Cal. 1996)).

[43] *Supra* note 2 at § 95488.9(g)(1)(A).

[44] CARB, *Release of Recirculated Draft Environmental Impact Analysis for the Proposed Low Carbon Fuel Standard* (Aug. 16, 2024), https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/notice_recirc_drafteia.pdf.

CARB did revise the value assigned to ethanol if it fails to meet the sustainability requirements. In the Revised Proposed Amendments, ethanol would receive the CARBOB (100.60) value instead of the ULSD value (105.76) if it fails to meet the certification requirements.[45] This modification does not impact the inadequacy of the EIA, because ethanol would still be given a high penalty that is not reflective of the fuel's actual CI score and could result in less ethanol sold into California and blended into California gasoline. As a result, emissions of criteria and toxic air pollutants in California could still increase, and the EIA must address this potential outcome.

CARB has also not updated its Standardized Regulatory Impact Assessment from September 2023.[46] As POET noted in its previous comment, CARB's SRIA does not address significant costs associated with the proposed sustainability requirements at a time when fuel prices are at record highs. CARB must examine the costs associated with the Revised Proposed Amendments' sustainability requirements in an updated SRIA.

IX. CARB Should Embrace Research Advancements Reflected in Argonne's Most Recent Model and Should Revise Outdated Features in CA-GREET.

CARB's proposed CA-GREET 4.0 Model does not take advantage of a number of advancements in research and modeling that have been incorporated into Argonne's R&D GREET 2023 Model and embraced by federal policymakers implementing biofuels policies under the IRA. This is a missed opportunity to adopt the most recent scientific research and advancements in transportation fuel modeling, and places biofuel producers at a continued disadvantage as older research and modeling has often poorly captured elements related to the carbon intensity of the biofuel lifecycle. POET also recommends changes that would allow the CA-GREET model to better capture several variables in the biofuel production process.

A. CARB Should Adopt R&D GREET 2023 as the Base Model for CA-GREET 4.0.

CARB's proposed CA-GREET 4.0 Model is based upon an outdated 2022 version of Argonne's GREET model which has been superseded by R&D GREET 2023. As noted above, this latest version of the GREET model, which includes forty-five pages of updates, is equipped to measure and credit carbon reductions associated with CSA practices and reflects the best current scientific research and data regarding transportation fuel emissions. Among other things, R&D GREET 2023 includes updates to the modeled well-to-gate GHG emissions of ammonia production (Section 2.3.6), and corn transport payload (Section 3.9). The model also updates corn farming assumptions not previously updated since 2021.

[45] *Supra* note 2 at § 95488.9(g)(1).
[46] CARB, *Appendix C-1 Standardized Regulatory Impact Assessment (SRIA), Proposed Amendments to the Low Carbon Fuel Standard Regulation* (Sept. 9, 2023), https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2024/lcfs2024/appc-1.pdf.

B. CARB Should Adopt Global Warming Potential Values from the IPCC AR5 Report.

POET recommends that CARB adopt Global Warming Potential ("GPW") values from the Intergovernmental Panel on Climate Change ("IPCC")'s Fifth Assessment Report ("AR5")[47] CARB is currently using GPW values from the IPCC Fourth Assessment Report ("AR4")[48] which was published in 2007. The GPW values in AR4 are now outdated. Other agencies, like the U.S. Environmental Protection Agency and United States Department of the Treasury in its IRA implementation are moving to AR5. Additionally, the United Nations Framework on Climate Change now requires parties to use GPW values from AR5.[49] CARB should adopt AR5 to ensure the LCFS program uses the most up-to-date science to accurately calculate emissions.

C. CARB Should Reevaluate Denaturant CI Values.

POET urges CARB to reevaluate the value for denaturant in the Proposed Calculator. Emissions calculations are incorrectly allocated on a denatured basis instead of an undenatured basis as done with the Current Calculator. This approach ultimately results in over calculating the final fuel's carbon intensity. For the final version of the Proposed Calculator, CARB should allocate emissions on an undenatured basis consistent with the Current Calculator. Additionally, POET recommends CARB allow user-defined inputs for the denaturant emission factor. Currently, CARB assumed CARBOB reformulated gasoline blend stock is used for denaturant, when in practice a mixture of hydrocarbons extracted from natural gas known as natural gasoline or pentanes plus[50] is used by most of the bioethanol industry. Natural gasoline has a carbon intensity of approximately 86 g/MJ compared to the 100.82 g/MJ CARBOB assumption in the proposed calculator. Furthermore, renewable naphtha produced at renewable diesel and sustainably aviation fuel facilities can also be used as a denaturant. However, the use of a renewable denaturant such as renewable naphtha would require a Tier 2 pathway application. User- defined denaturant inputs in the Proposed Calculator would allow for the use of renewable denaturant in Tier 1 pathways, reducing the number of Tier 2 applications CARB receives and incentivizing the use of renewable fuel as a denaturant.

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[47] *Climate Change 2014: Synthesis Report*, IPCC (2014), https://archive.ipcc.ch/report/ar5/syr/.
[48] *Climate Change 2007: Synthesis Report*, IPCC (2007) https://www.ipcc.ch/assessment-report/ar4/.
[49] *See Framework Convention on Climate Change, Decision on Common Metrics,* UNITED NATIONS (2022), https://unfccc.int/sites/default/files/resource/cp2022_10a01_adv.pdf.
[50] "Natural gasoline: A commodity product commonly traded in NGL markets that comprises liquid hydrocarbons (mostly pentanes and hexanes) and generally remains liquid at ambient temperatures and atmospheric pressure. Natural gasoline is equivalent to pentanes plus." *U.S. Energy Information Administration, Glossary* (last visited Aug. 26, 2023), https://www.eia.gov/tools/glossary/index.php?id=N#nat_gasoline.

D. CARB Should Allow User-Defined Process Chemical Usage for Ethanol Pathways.

CARB should modify the Proposed Calculator's treatment of process chemicals used in bioethanol pathways. The Proposed Calculator does not allow the pathway applicant to specify use of low-CI process chemicals, which distorts the CI value of POET's bioethanol. Specifically, POET's patented BPX process uses a less carbon-intensive group of chemicals than most bioethanol producers. A simple change to the Proposed Calculator to allow user-defined process chemical usage could cure this inaccuracy. This modification would be consistent with the calculator's accommodation of a variety of other user-defined inputs from denaturant to feedstock transportation distance. 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.

If CARB elects not to allow user-defined process chemical usage, CARB should at least revisit the current chemicals emission factor of 2.02 g/MJ. This value is grossly overestimated and is based on industry data over a decade old that did not represent the group of chemicals utilized in POET's patented BPX process. POET would welcome the opportunity to work with CARB to update the chemicals emission factor.

E. CARB's Proposed Calculator Should Include Syrup in its Wet DG Pathway Allocation

The Proposed Calculator's Wet DG Pathway allocation includes quantities of wet, modified, and dry DG. Syrup production is excluded from this allocation and is only included to quantify total co-product production for the co-product credit calculations. However, both syrup and wet DG completely bypass the drying system. From an emissions standpoint, the two products are identical. Therefore, syrup should be included in the Wet DG Pathway allocation.

X. Miscellaneous Issues

POET provides the comments on the below additional topics in the Revised Proposed Amendments.

A. POET Supports the Proposed Credit True-Up that Would Apply to Temporary Pathways.

Beginning in 2025, CARB will allow credit true ups after annual verification for fuel pathways, including temporary pathways that subsequently receive fuel pathway certification, that have

lower verified operational CIs than the CI listed in the fuel pathway or temporary pathway.[51] CARB will calculate the number of LCFS credits representing the difference between the reported CI and the verified operational CI from annual Fuel Pathway Reports and place those credits in the reporting entity's account after August 31st for the prior compliance year. POET is supportive of this credit true up mechanism. Including temporary pathways in credit true ups promotes innovation by allowing pathway holders to realize the full credit value of operational CI scores.

B. CARB Must Correct Typographical Errors in the Sustainability Certification Regulatory Provisions.

CARB should review § 95488.9 for typographical and other inadvertent errors. For example, § 95488.9(g)(1) refers to a subsection (C) that does not appear to exist. CARB should clarify or fix this error. Additionally, in proposed § 95488.9(g)(4)(B), subsections (3) and (4) are misnumbered and should be (1) and (2).

C. CARB's Credit Cap on Soybean Oil and Canola Oil Based Biodiesel Departs from the LCFS Program's Longstanding Market-Based Approach.

In its Revised Proposed Amendments, CARB now proposes limits to the total volume of biodiesel eligible to generate credits within the LCFS program.[52] The rule caps credit-eligible biodiesel for each biodiesel producer at twenty percent of the company's total annual production volume, and assigns to reported quantities of biodiesel in excess of the twenty percent cap a CI equivalent to diesel fuel – regardless of that fuel's actual CI as measured on a lifecycle basis. This rule establishes an unfortunate precedent for administration of the LCFS, which is founded on a market-based, technology-neutral approach to reducing the carbon-intensity of California's transportation fuel supply. CARB should allow the market to establish its own cap on biodiesel supply based on price signals from LCFS credit values.

D. POET Supports the Proposed Revisions to the Compliance Reporting Rules.

CARB has amended § 95491(b)(1)(2) to bring the rules regarding the timeliness of compliance reporting under this section into alignment with CARB's approach to enforcement of other elements of the LCFS program's reporting requirements. POET supports CARB's proposed approach, which interposes more proportionate penalties in place of complete credit forfeiture as a consequence for untimely submissions.

[51] *Supra* note 2 § 95488.10(b).
[52] *Id.*, § 95482(i).

E. CARB Should Approve E15.

POET again urges CARB to expedite its approval of E15, which has been thoroughly studied in California for years, and which offers material climate and health benefits relative to E10. As noted in previous comments submitted to CARB and the California Energy Commission, E15 will provide immediate economic relief from historically high gas prices while cutting 1.8 million metric tons of GHG emissions annually, equivalent to removing more than 411,000 cars off the road.

CONCLUSION

POET appreciates the opportunity to comment and looks forward to working with CARB to make the LCFS a continued success for California. If you have any questions, please contact me at Josh.Wilson@POET.com or (202) 756-5612.

Sincerely,

Joshua P. Wilson
Senior Regulatory Counsel

EXHIBIT 1

STAFF SUMMARY
Application for Certification of
Corn Ethanol / Dry Mill/ with Residue Co-Products Credit LCFS Pathway
Trestle Energy LLC
Mason City, Iowa
(ETHC116)

Date Deemed Complete:	December 7, 2015
Date Posted:	December 18, 2015
Date Certified:	December 30, 2015

Pathway Summary

Located in La Jolla, CA, Trestle Energy LLC, a development firm committed to developing low carbon production systems, proposes a corn ethanol pathway with residue co-products (CERC) of less than 50% of available agricultural residues. Trestle has applied for one Method 2B pathway under the California Low Carbon Fuel Standard (LCFS). System expansion accounting methods are applied for the emissions consequences of CERC for emissions credits. In the proposed feedstock supply system, the utilization of corn stover agricultural residues reduces biofuel carbon intensity by removing biomass from farm fields and processing it into biofuel co-products used at power plants to generate electricity. The proposed CERC pathway incorporates co-products to directly reduce biogenic emissions and displace fossil fuel combustion at power plants. Trestle has worked with Golden Grain Energy – a dry mill corn ethanol plant located in Mason city, Iowa - to demonstrate a carbon intensity reduction by utilizing the proprietary residue co-product supply system. The CI impact of the CERC pathway is added to Golden Grain Energy's existing ethanol pathway CI in order to obtain the overall CI of the combined systems. This practice could be applied to other corn ethanol plants provided that Trestle can establish supply chain traceability for stover used for electricity generation, and subject to the operating conditions and limits described in this Summary.

Carbon Intensity (CI) Impact of the Trestle Pathway

The applicant requests one CERC pathway that requires changes to biofuel feedstock supply chain, including additional use of farm equipment for stover removal, additional chemical inputs to offset nutrients removed with the stover, and additional use of transport equipment to haul stover away from feedstock-producing fields. Other changes outside of the agricultural sector involve processing of agricultural residues into solid fuel co-products, delivery of solid fuel co-products, and co-product utilization to directly displace fossil fuel consumption. For the CI impact calculation, the applicant introduced several user-defined parameters and provided some parameters that are not available in the CA-GREET1.8b model, including both pre- and post- processing residue

transport distances, residue utilization rate, energy use from residue collection and processing, and efficiency penalty for residue utilized at power plants. Using the parameters included in the LCA report, the applicant modified the CA-GREET model and calculated a CI of -18.01 gCO_2e/MJ for the proposed CERC pathway.

The proposed CI impact result has been evaluated against the carbon intensity constraint suggested by ARB staff that the CI reduction (credit) achieved by the CERC system should be not greater than the reduction that would be achieved by using the solid fuel co-product to meet thermal energy requirements of the Golden Grain Energy ethanol production facility. Using Golden Grain Energy facility energy use data (Confidential Business Information), staff determined that the proposed CERC pathway is consistent with the proposed CI reduction limit. The production and utilization of residue co-products reduces the total CI to 70.65 gCO_2e/MJ for the Golden Grain Energy pathway (ETHC083), with 100 percent Dry DGS.

Currently, the Golden Grain Energy facility has four corn-ethanol pathways. This pathway with residue co-products will be an additional pathway available only to volumes of ethanol which are otherwise eligible for registration under pathway code ETHC083 (subject to any applicable constraints of ETHC083).

Proposed Lookup Table Entries

Fuel	Pathway Identifier	Pathway Description	Carbon Intensity Values (gCO_2e/MJ)		
			Direct Emissions	Land Use and Other Indirect Effects	Total
Ethanol from Corn	ETHC116	2B Application*: Midwest; Dry Mill; Dry DGS; NG. Using corn residue co-products to generate credit for displaced fossil fuel.	40.65	30	70.65

*Specific Conditions Apply

Applicable Operating Conditions

Operations at the plant will be subject to the following operating conditions designed to ensure that the CI of the corn ethanol produced at the Golden Grain Energy plant will remain at or below the values appearing in the above table.

- The CERC pathway will be subject to periodic assessments of agricultural residue markets to detect whether agricultural residue use within the CERC pathway is competing with residue use as a cellulosic biofuel feedstock, and the

emission accounting for agricultural residue co-products within the CERC pathway may be revised if such competition is detected.

- Other residue processing methods (processed into pellets, cubes or briquettes) and types of process energy (diesel or electricity or the combination) may be used as long as the proposed CI impact reported in the above table is not exceeded.

- Average baled residue transport distance and post processed residue transport distance will not exceed the values specified in the application.

- Contracts establishing supply chain traceability are required for verification of corn stover utilization for electricity generation.

- The CERC pathway will be restricted to the corn ethanol plant only. No other biofuels will be considered.

- The stover utilization should not exceed 50% by mass per harvested acre.

Staff Analysis and Recommendations

Staff has reviewed the Trestle Method 2B application and finds the following:

- Staff has replicated, using the CA-GREET spreadsheet, the carbon intensity reduction value calculated by the applicant;

- Staff has concluded that the CI reduction limitation with the Golden Grain Energy plant's actual thermal energy consumption is not likely to exceed the proposed CI reduction specified in Trestle Method 2B application.

On the basis of these findings, ARB staff recommends that Trestle application for the above Method 2B LCFS pathway with Golden Grain Energy Facility energy use data be approved for certification as a <u>prospective</u> pathway.

Fuels with prospective CIs are not eligible to claim credits under the LCFS under the readopted LCFS regulation, effective January 1, 2016. To claim provisional credits the applicant must provide one quarter of operational data once commercial production has commenced. ARB will then complete an updated lifecycle analysis and make necessary adjustments to the originally certified prospective CI if warranted and approve a provisional CI for each of the pathways being considered in this application. To confirm compliance with updated operating conditions, the Executive Officer may reevaluate any aspect of the review at any time and revise the certification to reflect new information. At any time after certification, the Executive Officer may increase the

CI values upon a determination that the provisional CIs underestimate fuel life carbon intensity. (Cal. Code Regs. tit. 17, § 95486, subd. (e)(3)(K) (original LCFS); Cal. Code Regs. tit. 17, § 95488, subd. (c)(5)(L) (beginning January 1, 2016).)