Alternative Fuels & Chemicals Coalition

*Advocating for Public Policies to Promote the Development & Production of Alternative Fuels, Renewable Chemicals, Biobased Products, and Sustainable Aviation Fuels*

**February 20, 2024**

**California Air Resources Board**
**Rajinder Sahota**
**Deputy Executive Officer**
**Climate Change and Research, CA Air**
**1001 1 St #2828**
**Sacramento, CA, 95814**

**Re.: Proposed Low Carbon Fuel Standard Amendments**

**Dear Rajinder Sahota,**

## Background

AFCC and its member companies welcome the opportunity to provide comments on the CARB proposed low carbon fuel standard amendments.

AFCC is a collaborative government affairs effort organized by the Kilpatrick Townsend & Stockton law firm and American Diversified Energy. AFCC was created to address policy and advocacy gaps at the federal and state levels with respect to renewable chemicals, bioplastics/biomaterials, cell-cultured food ingredients, alternative proteins, single cell protein for food and feed, enzymes, alternative fuels, biobased products and sustainable aviation fuels sectors. AFCC member companies work on food and fiber supply chain security and sustainability, renewable chemicals, industrial biotechnology, bioplastics and biomaterials, and biofuels.

## Areas of Importance for Amending the LCFS

The amendments to the LCFS are focused on expanding the definition of renewable biomass to include woody biomass, forest residuals, sawdust, and ensuring these are treated in any LCA model as carbon neutral which is aligned with the enacted federal definition of carbon neutrality. Furthermore, amendment to the areas of risk of wildfire should be expanded and producers qualify for the LCFS for sustainable aviation biofuels, advanced biofuels, cellulosic biofuels, marine biofuels, hydrogen and ammonia. Innovation in these areas continues to grow, as such LCFS should account for these technologies correctly.

## § 95481. Definitions and Acronyms.

"California-modified Greenhouse Gases, Regulated Emissions, and Energy use in Transportation model (CA-GREET)" is a modified version of Argonne National Lab's Greenhouse Gases, Regulated Emissions, and Energy use in

Transportation (GREET) model used to evaluate well-to-wheel GHG emissions in the LCFS. The CA-GREET model is periodically updated, and includes a version number suffix, e.g., CA-GREET4.0.

*It is recommended to amend the definition as: Projects will occur in CA and developers should not be in a position to build a project with no GHG guidance.*

Individual cases exist for developers such as: 1. Wildfire, there need to be details on areas with wildfire risk. 2. Thinnings to increase surrounding tree growth. 3. Agricultural residues. 4. Lumbermill and sugar mil waste. 5. Waste should have zero iLUC, similar to UCO. 5. Counterfactuals are consistent with carbon neutrality.

(20)"Biomass" means non-fossilized and biodegradable organic material originating from plants, animals, or micro-organisms, including: products, byproducts, residues and waste from agriculture, forestry, and related industries; the non-fossilized and biodegradable organic fractions of industrial and municipal wastes; and gases and liquids recovered from the decomposition of nonfossilized and biodegradable organic material.

*It is recommended to amend the definition as: align with federal enacted law for the definition of carbon neutrality.*
*Expand CARB's definition of biomass to include: Federal use of GREET. Support CARB's efforts in supply chain tracking, consistent with RED, Federal requirements. Carbon neutrality is Federal law, align Carb with Federal definition.*

## § 95481. Definitions and Acronyms. Definition of Renewable Hydrogen

Renewable Hydrogen" means hydrogen derived from

(1) electrolysis of water or aqueous solutions using renewable electricity;

(2) catalytic cracking, oxidation or steam methane reforming of biomethane or other renewable hydrocarbons; or

(3) thermochemical conversion of biomass, including the organic portion of municipal solid waste (MSW).

*It is recommended to amend the definition as: Hydrogen derived from thermochemical conversion of biomass, including the bio-genic portion of municipal solid waste (MSW) or landfill diverted MSW which contains biogenic and non-biogenic/non-recyclable material.*

**§ 95481. Definitions and Acronyms. Definition of Biomethane**

*It is recommended to have a distinct definition of renewable natural gas to include methane derived from other renewable sources, such as methane derived from renewable resources such as bio-genic and non-biogenic components in the landfill-diverted MSW.*

Methanation uses H2 and CO2 to create synthetic methane and becomes a method for bulk hydrogen storage and bulk hydrogen transportation via existing natural gas pipelines.

**§ 95488.1(c). Tier 1 calculator for hydrogen**

**Proposal to include Tier 1 calculator for**

1. Electrolysis

2. Steam methane reformation using RNG or North America Natural Gas

*It is recommended to include thermochemical conversion of landfill diverted MSW (biogenic and non-biogenic component) with carbon capture in Tier 1 pathway for hydrogen.*

Thermochemical conversion of organic component of MSW is well accepted technology for producing renewable hydrogen. Approval of CARB for landfill diverted MSW as feedstock for thermochemical conversion technology with carbon capture under Tier 1 pathway, will support rapid deployment of these projects.

**§ 95488.8. Fuel Pathway Application Requirements**

*Applying to All Classifications. section (g) Specified Source Feedstocks (1) (A) subsection 3 be amended to read as follows:*

~~*Small-diameter, non-merchantable*~~ *Any forestry residues and byproducts removed as part of a forest fire fuel reduction,* ~~*last*~~ *stand improvement or slash/tops from a treatment (including harvests)* ~~*where no clear cutting occurred;*~~ *from forest lands that meet applicable federal, state or local regulations; Municipal solid waste that is diverted from landfill disposal;*

**§ 95488.8. Fuel Pathway Application Requirements Applying to All Classifications.**

*It is recommended to amend as:*

*(4)* Areas at risk of wildfire include: thinnings to increase surrounding tree growth, agriculture residues, lumber mill and sugar mill waste, wasts should have zero ILUC – similar to UCO, and counterfactuals are consistent with carbon neutrality. Carbon neutrality aligns with federal definition.

**§ 95488.8(g). Specified Source Feedstocks**

1. MSW diverted from landfills will be added under specified feedstock sources.
2. Robust chain of custody documentation that traces MSW to the point of origin is required.

*It is recommended that the definition of MSW diverted from landfill to include non-biogenic components/ non-recyclable components such as plastic. Considering 48% of landfill waste is non-biogenic (by mass, ref 2023 R&D GREET model), landfill diverted MSW represents a valuable untapped, sustainable, and renewable clean energy resource when carbon capture is implemented.*

**§ 95488.8 (i)(1)(A)-(B).**

The proposed LCFS regulatory revisions that CARB released on December 22, 2023, would narrow the power-sourcing landscape for Power-to-Liquid (PtL) producers. We urge CARB to retain and expand the language which prescribes low-carbon intensity electricity (Low-CI electricity) can be sourced flexibility through the use of RECs or via a qualifying Green Tariff program. Therefore, AFCC and its member companies propose the following:
(i) add to the LCFS regulation a definition of the term "power-to-liquid fuel," with the term defined to mean transportation fuel that is produced from captured carbon dioxide, water, and low-carbon intensity (low-CI) electricity; and (ii) make low-CI electricity used in the production of such fuel, including power-to-liquid sustainable aviation fuel (PtL SAF), eligible for book-and-claim accounting. Indirect accounting mechanisms are warranted for the production of PtL SAF and other PtL fuels, and perhaps more importantly, would promote the scale-up of the PtL fuels industry. PtL SAF in particular has the potential to make a significant contribution to the decarbonization of California's aviation sector.

**§ 95488.8(I)(3). Expanding Book and Claim to low CI Hydrogen used in FCVs and alternative fuel production for use in transportation**

1. Book and claim for low CI hydrogen injected into dedicated pipelines of hydrogen, which are physically connected to California.
2. Such hydrogen can be used in direct transportation or in the further process of production of alternative fuel.
3. CI of hydrogen for Well to Wheel Analysis is defined as <= 55 gCo2e/MJ (CI-45) for gaseous H2 and <= 95 gco2e/MJ (CI-79) for liquid hydrogen if transported as liquid before pipeline injection.
4. All the projects operational post Dec 31, 2023 are eligible for book and claim.

*It is recommended that under Book and Claim for hydrogen the requirement of demonstration of deliverability to take effect from Jan 1st, 2041, similar to RNG criteria.*

**§ 95491 (d)(4)(D). Book and Claim accounting for Low-CI electricity used in production of Hydrogen and direct air capture projects**

1. Low-CI electricity supplied by new or expanded low-CI projects that begin production on or after January 1, 2024, or
2. Within three years of the start of the hydrogen production facility or direct air capture project, whichever is later.
3. Book and claim accounting at qtrly matching, any unmatched CI electricity quantities produced will expire for LCFS reporting.

*It is recommend: The carbon intensity of grid-sourced electricity to be evaluated according to the generation portfolio of the PPA (power purchase agreement) without regard to the Three Pillars (Incrementality, Temporal matching, Deliverability).*

Electric power requirement for thermochemical conversion pathway, including balance-of-plant, is substantially less than the power required for other pathways. Considering the energy of the product, hydrogen fuel, the majority comes from feedstock (MSW). GHG emissions associated with process energy inputs (grid power) shall be included in the lifecycle hydrogen CI. Technology improvements will result in further efficiencies including industrial heat recovery and sharing.

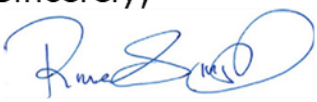
**Renewable Natural Gas (RNG) – Importance of the Transportation Market Segment to Avoid Phase Out for Biomethane and Hydrogen**

The CARB proposed amendments seek to phase out avoided emission pathways for projects that break ground after December 31, 2029, for biomethane used as a transportation fuel through 2040 and for biomethane used to produce hydrogen through 2045. While we understand that CARB's intention here is to begin to transition biomethane away from the transportation sector – this will have impact on both short term and long term investments, and the underlying rational is being construed by some as science-driven rather than a policy decision concerning the phase out of combustion in transportation. AFCC and its member companies do not support the phaseout of avoided emission credits. CARB should be explicit that the policy decision to discontinue recognition and eligibility of avoided methane emissions in vehicle pathways should not be interpreted as a departure from the established rigorous science of accounting for the benefits of avoiding methane emissions which continues to be appropriate for non-vehicle sectors. AFCC and its member companies recognize that avoided emission credits for biogas to electricity projects remain, and

applaud CARB for recognizing the value of these projects by proposing to retain this aspect of the program.

**Conclusion**
AFCC and its member companies are requesting forest residuals or hazardous fuels to be treated as carbon neutral feedstocks for producers of biofuels. We respectfully ask CARB to have consistency in its regulatory development of standards to that of other states, federal agencies, and international policies, for ease of adoption, and not create market confusion.

Sincerely,



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