

August 7, 2022

Cheryl Laskowski

Transportation Branch Chief

California Air Resources Board

1001 I ST Sacramento, CA 95814:

RE: LCFS Rulemaking Input- ILUC models and Renewable Biomass

(Comment submitted electronically via Comment Submittal Form at https://www.arb.ca.gov/lispub/comm/iframe_bcsbform.php?listname=lcfs-wkshp-jul22-ws&comm_period=1)

Dear Dr. Laskowski:

FS Agrisolutions Industria de Biocombustíveis Ltda (FS, Fueling Sustainability) appreciates the opportunity to provide these comments in response to the Public Workshop to Discuss Potential Changes to the Low Carbon Fuel Standard.

FS is the first Brazilian company to produce ethanol, animal nutrition products, corn oil and bioenergy exclusively from second crop corn. FS utilizes energy cogeneration from biomass to meet its own energy needs and to generate surplus electricity that is sold to the Brazilian electrical grid. We integrate a new low carbon value chain that encompasses low carbon intensity (Low-CI) second crop corn, incentives to sustainable forest cultivation, the sale of high-quality animal nutrition and ethanol products, and the generation of bioenergy and steam.

In addition, we have a BECCS project under development that will capture CO₂ from fermentation and will provide a fuel with negative carbon intensity values. The use of combustion engines with low carbon fuels can be an excellent and feasible strategy for transitional decarbonization and ensure that the country's pledges are achieved with viable and tangible technologies in a short period of time. As CARB stated in the Draft 2022 Scoping Plan Update:

"Transitioning away from ICE vehicles is part of the solution, but we must ensure that an adequate supply of zero-carbon alternative fuel is available to power these vehicles."¹

¹ California Air Resources Board, Draft 2022 Scoping Plan Update (May 10, 2022), at p. 152, available at <https://ww2.arb.ca.gov/sites/default/files/2022-05/2022-draft-sp.pdf>

We take this opportunity to request CARB's attention to three (3) topics that should be addressed in the rulemaking to enable the continued advancement of the Brazilian ethanol industry in a manner that achieves GHG reduction goals:

- 1) Indirect land use change for sequential cropping
- 2) Definition of default specific values for crops produced under this system.
- 3) The use of renewable biomass as process fuel

We concur with the need of rigorous assessments of new pathways and admire the leading position that CARB has taken on the issue, particularly since the LCFS program was launched.

The GHG Benefits of Second Crop Corn

Brazilian corn ethanol producers have grown their market share within Brazil and seek to increase exports. An important target is to be eligible to participate in the European and North American markets. Through engagement with CARB and its LCFS program, we see great opportunities to contribute to California's and the global community's short and long-term GHG and fossil fuel reduction objectives. To this end, we use unique feedstock (second crop maize) that does not require additional land and have developed processes based on renewable energy in order to achieve an increasingly circular and sustainable economy.

Land use change is a complex and essential topic to address regarding the optimal method to use biofuels to slow down and ultimately reverse climate change. Although food and biofuels are viewed by some as competing uses of land resources, we have developed new technologies that can be shown to address these concerns. Land use analysis must be revisited to consider and recognize the benefits of using the same land for multiple harvests. Research and on-the ground observation indicate that double cropping maize after soybeans substantially improves the yields and economics of existing agricultural lands. This agricultural technology has evolved significantly last decade. It is now robust and deserving of CARB's attention and analysis. These are the type of global market signals regarding land use that it is important for the LCFS to send.

Science-based evidence indicates that 2nd crop maize can improve soil health and increase the yields of the first crop. In systems where corn ethanol is co-produced with DDG, new sources of protein are produced for the food system, and can lead to negative iLUC. These promising technologies and practices deserve fair treatment along with biofuels produced from carinata and camelina.

Negative iLUC values for second crops have already been recognized in scientific literature and by respected entities that establish requirements and guidelines for low carbon fuels. In 2020, the GHG benefits of second crop corn ethanol in Brazil were documented as having negative iLUC in a scientific assessment published by Nature Sustainability². This paper was based on the Brazilian Land Use Model (BLUM), which is a reduced version of FAPRI model used in the RFS2 (Renewable

² <https://doi.org/10.1038/s41893-019-0456-2>

Fuel Standard) regulation. On March 2021, ICAO recognized a similar case of secondary crop (carinata) as having negative iLUC under the CORSIA Default Life Cycle values³. This assessment is a converging result of improved versions of the GTAP model (used in LCFS) and GLOBIOM (reference for several policies in the EU).

Although the simulation of second crop cases is possible in the iLUC models, the current LCFS regulation does not recognize the GHG benefits of multi-cropping compared to single cropping. This is a deficiency in CARB's current model that should be addressed in this rulemaking.

Having said that we respectfully request that CARB address these important issues:

- 1) Indirect land use change for sequential cropping
- 2) Definition of default specific values for crops produced under this system.

We are fully available to provide data, analysis, and engagement on these issues. Please advise regarding any requested data or evidence, or any other support that CARB may need to better analyze these issues.

Renewable biomass

Aligned with the CARB objectives highlighted in the LCFS Workshop held on July 7th 2021, FS produces an extremely Low-CI ethanol and is focused on demonstrating how our technical innovations can contribute to the LCFS. **As an important component of this LCFS rulemaking, FS would like to advocate for the consideration of using renewable biomass as process fuel.**

One key issue is the use of renewable biomass for thermal and electric energy. Renewable biomass provides thermal and electrical energy for the industry, without any fossil fuel usage in the production process. This is highly beneficial for the production of low carbon fuel as the approach reduces processing emissions due to the biogenic nature of the carbon burned in the energy generating boilers.

While other corn ethanol producers utilize fossil natural gas or even coal, FS is showing the potential of using renewable biomass (such as planted eucalyptus and other energy crops) or wood residues for process energy. CARB's recognition of the benefits of utilizing renewable biomass to generate process energy as part of a Low-CI ethanol production process is extremely important and will motivate other market participants to move away from fossil sources.

Agricultural residues are treated as carbon neutral so wood residues should be treated similarly. The woody biomass that is cultivated for energy purpose is recognized by IPCC⁴ as neutral because the carbon that is released during combustion has previously been sequestered from the atmosphere in the growing process. We must emphasize that the biomass sources used by FS are fast growing species. The global decarbonization plan recently published by IEA emphasizes that

³ <https://www.icao.int/environmental-protection/CORSIA/Documents/ICAO%20document%2006%20-%20Default%20Life%20Cycle%20Emissions%20-%20March%202021.pdf>

⁴ 2006, IPCC Guidelines for National Greenhouse Gas Inventories (Section 1.2 of Volume 1).

biomass necessarily plays an important role in the energy transition as part of a plan to increase the use of bioenergy by around 60% by 2050.⁵ This IEA finding highlights the importance of CARB analyzing the various types of biomass as process energy for LCFS pathways and determining the parameters of Low-CI renewable biomass.

Due to importance of this issue, we take this opportunity to request CARB's attention to the study and recognition of the role of renewable biomass as a source of Low-CI process energy.

As shown and exemplified, FS is implementing best practices including:

- using feedstock from regenerative and second-crop agriculture
- developing a BECCS capability
- using renewable biomass as an energy and heat source
- maximizing efficiency in production technology
- being committed to socio-environmental responsibility in process

Recognition of the innovative steps FS has integrated and continues to integrate into its feedstock, energy, production, and sequestration processes of ethanol is consistent with CARB's recognition in the Draft Scoping Plan of the importance of carbon negative fuels for internal combustion engine ("ICE") vehicles. Integration of our work into CA-GREET4.0 will send the correct market signals regarding sustainability, GHG reductions, and agricultural innovation.

Please count on FS for providing data and evidence, or any other support that CARB may need to pursue the listed topics.

Respectfully,

DocuSigned by:

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(FS Signatory).

Daniel Costa Lopes

Executive VP Sustainability & Businesses Development

⁵ IEA Net Zero by 2050, A Roadmap for the Global Energy Sector