Fueling Sustainability

ENERGIA QUE ABASTECE O BEM

To Mr. Richard Corey

Executive Officer

California Air Resources Board

1001 I ST Sacramento, CA 95814:

RE: LCFS Rulemaking Input- Second Crop Corn

(Comment submitted electronically via Comment Submittal Form at https://www.arb.ca.gov/lispub/comm2/bcsubform.php?listname=lcfs-wkshp-dec21-ws&comm_period=1 )

Dear Mr. Corey:

FS Agrisolutions Ltda, "FS", Fueling Sustainability, appreciates the opportunity to provide these comments in response to the Public Workshop to Discuss Potential Future Changes to the LCFS Program.

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

**This letter urges CARB to evaluate and determine iLUC values and agricultural inputs values for biofuels produced utilizing sequential cropping techniques that result in second crop feedstocks.**

FS started its pathway application to seek a CARB approved Tier 2 Pathway in 2019. Due to the novelty and innovations inherent to the FS production process, including the use of second crop maize as feedstock, the use of biomass as process fuel, and the production of by-products with high added value, there have been extensive interactions between FS and CARB staff on the various life cycle analysis (LCA) issues. Unfortunately, these interactions have not yielded an approved pathway due to the dramatic differences between the FS process that utilizes second crop maize in Brazil as compared with the various US plants that utilize single crop corn to produce ethanol. Based on these pathway discussions and the need for CARB to

evaluate the new processes, farming practices, technology and data presented by FS, this rulemaking provides an essential forum for CARB to consider these important issues with opportunities for public input and for CARB to implement changes to CA-GREET and other California LCA models that meet the LCFS standard of scientific defensibility.

Aligned with the CARB objectives highlighted in the December 7th Workshop, FS is producing an extremely Low-CI ethanol and is seeking to participate in the California LCFS. The second crop maize ethanol produced by FS has been evaluated by Brazil's RenovaBio program and was previously determined to have one of the lowest CI of any ethanol fuel.[1] Other stakeholders have also suggested several concepts to staff, one is to reevaluate the land use change values, which is fully in line with FS' suggestion that CARB should assess second crop land use change values.

FS has submitted extensive analysis and data to CARB through the pathway application process to similarly establish an LCFS pathway that recognizes the CI reductions that the complete FS process delivers. The use of techniques like second crop maize (planted after soy) can improve soil health and increase the yields of the first crop, obtaining positive environmental impacts. Hence the recognition of sequential cropping and the evaluation of whether any indirect land use change results by CARB is a critical issue. CARB's determination on these issues and the establishment of any necessary parameters for Low-CI second crops will send the market a signal to utilize these environmentally beneficial practices.

There is a growing body of science-based evidence supporting negative iLUC value for second crops. In 2020, the use of second crop maize in Mato Grosso was documented with negative iLUC in a scientific assessment published by Nature Sustainability[2]. This paper was based on the Brazilian Land Use Model (BLUM), which is a reduced version of FAPRI model used in the RFS2 regulation.

On March 2021 ICAO similarly recognized a secondary crop (carinata) as having negative iLUC under the CORSIA Default Life Cycle values[3]. This assessment is a converging result of improved versions of the GTAP model (used in LCFS) and GLOBIOM (reference for several EU Policies). The FS process has also been assessed by different iLUC modelers using the same GTAP version used by CARB to develop existing iLUC values in LCFS. Such results also yielded negative CI values, as presented in the documents supporting the FS pathway application.

In addition to being a Low-CI second crop, FS maize ethanol has multiple by-products: (i) our animal nutrition creates animal feed with negative indirect value; (ii) our corn oil, that can be used in acid or enzymatic esterification processes to enter the biodiesel raw material matrix or even renewable diesel. These products further contribute to our negative carbon impact.

---

[1] Recently, another Brazilian ethanol market participant obtained a lower CI score than FS, but as described in this letter, FS is continuously working to decarbonize the ethanol it supplies and plans to produce even lower CI ethanol in the future.

[2] Moreira, Marcelo MR, et al. "Socio-environmental and land-use impacts of double-cropped maize ethanol in Brazil." Nature Sustainability 3.3 (2020): 209-216.

[3] ICAO document CORSIA Default Life Cycle Emissions Values for CORSIA Eligible Fuels, March 2021

Fueling Sustainability

ENERGIA QUE ABASTECE O BEM

California has pioneered a range of effective approaches that have set the standard for air quality and climate programs for the USA and abroad. CARB has also inspired the Brazilian RenovaBio Program, in which FS has one of the lowest carbon intensities among 260 plants. FS is dedicated in being a market and technology leader in low-carbon fuels, including engaging in a pioneering carbon capture and sequestration (CCS) project that will be able to promote a negative carbon footprint.

Based on the aggressive and dedicated work that CARB has done in the past and CARB's plans to further decarbonize transportation, we perceive a crucial opportunity for CARB to recognize that second crop maize merits recognition in the LCA models that underlie the LCFS program. Recognition of the benefits of second cropping by CARB will create an opportunity for the market to support the expansion of this practice that provides a sustainable way to produce more low carbon fuel from less land.

We at FS are readily available for providing data and evidence, or any other support that CARB may need to pursuit the listed topics.

Respectfully,

DocuSigned by:
Daniel Lopes
71D45BC1573E4E2...

Daniel Costa Lopes

Executive VP Sustainability & Businesses Development