

November 5, 2020

Richard Corey
Executive Officer
Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Comments Regarding the Low Carbon Fuel Standard Workshop to Discuss Potential Regulation Revision

Dear Mr. Corey,

The Brazilian Sugarcane Industry Association (“UNICA”) appreciates the opportunity to again provide comments on the California Air Resources Board’s (CARB) potential regulation revision to the Low Carbon Fuel Standard (LCFS), which were posted for comments on October 14, 2020.

In this response, I outline our ongoing concern with the efficacy of the CARB calculator and outline simple suggestions for rectifying the situation. Our goal is to see more low-carbon sugarcane ethanol reach Californian ports consumers’ gas tanks. To accomplish this goal, CARB needs to revisit the sugarcane calculator.

For the past decade, UNICA member companies have helped California meet the aggressive goals of the LCFS by providing volumes of low-GHG-producing sugarcane ethanol. California is the most important market for Brazilian sugarcane ethanol in the United States, the vast majority of our exports to the US is being utilized by California motorists.

As your presentation shows¹ ethanol comprises the majority of the volumes of the LCFS since the beginning of the program, and it accounts for the majority of the credits generated in California to date. We are proud of our contributions to the program and want to keep doing more.

We are hopeful you continue to utilize Brazilian ethanol and believe that if CARB updates its calculators California will move closer to achieving its goals.

While we recognize the effort of CARB staff to make the pathway registration process more efficient, we believe sugarcane ethanol is not scored accurately and your calculators need some fine tuning.

¹ LCFS Workshop on 10/15/Carb staff presentation - day 1, slide 5: <https://bit.ly/3kOu53q>

Back in 2018, UNICA urged CARB to update the registration process for Brazilian mills and allow for them to register pathways. CARB denied our request and the regulation was finalized without the needed changes.

As mentioned by the Branch Chief at the Board meeting in September 2018, CARB wanted to simplify the process and Tier 2 was an option for the mills that could prove significant improvement in carbon intensity (CI) using their specific data. Although we know this is an option for mills in Brazil, it is an expensive and time-consuming alternative for both the mills and CARB staff.

We are certain that if the Tier 1 calculator could be improved, many more mills would participate in the LCFS and California will benefit for a broader source of credits to fulfill its goals of a lower carbon economy.

In the pages below, we identify the most important problems with the CI calculator (tier 1, specifically) scoring of sugarcane ethanol. We respectfully request that CARB staff carefully consider these comments as we believe these changes need to be implemented in order to help California accurately capture the reality of the sugarcane ethanol industry in Brazil and reap the benefits of this low carbon biofuel.

The comments below are mostly directed to the GREET 3.0 Tier 1 simplified CI calculator for sugarcane-derived ethanol:

1- Mechanization

UNICA members have been successful in dramatically reducing emissions through the mechanization process, and we believe our members should be recognized for this progress.

Our request remains simple and straight-forward: Our member companies should be allowed to input site specific mechanization data into the calculator. Previously we have advocated for CARB to include a site-specific mechanization input in the Tier 1 calculator.

Our position remains the same in November 2020. Brazilian biofuel producers who have made significant technological investments should not be penalized by lower default assumptions.

Mechanization is a reality throughout the ethanol producing area of the country, the South-Central region. This area is responsible for all the ethanol exported to international markets. The increase in mechanization in the region has been remarkable, reaching a mechanization level of nearly 98 percent in the 2019/2020 crop year² compared to just 28.5 percent 12 years ago. According to the State-owned Brazilian Food Supply Company (CONAB in Portuguese), from the Brazilian Ministry of Agriculture, Livestock and Food Supply (MAPA) the current 2020/2021 harvest will hit the same level mechanization in

² file:///Users/unica/Downloads/CanaZ4oZlevantamento-5.pdf (page 48)

the South-Central region³ as of the previous harvest, and in São Paulo state this number will reach 98.6%.

The investments in mechanization has helped the sugarcane sector reduce GHG emission from harvesting by 57% over the past 10 years (from 4.8 to 2.1 g CO₂eq/MJ of ethanol).

In the CI calculator for sugarcane ethanol, CARB offers two default values for sugarcane mechanization for Brazil: 80 percent for São Paulo state and 65% for other states in the Center-South region. Although some UNICA members may opt for the default value, the vast majority of our members, especially those located in Sao Paulo, where nearly all harvesting is mechanized, would prefer to prove their operations are at highest levels of mechanization.

We again urge CARB to offer an option for self-declared mechanization percentage in the tier 1 CI calculator. If for some reason this is not feasible, we respectfully ask staff to adjust the default mechanization values for Center-South Brazil to a value no lower than 85% and to Sao Paulo State to a value no lower than 95%. By doing so, CARB will be scoring input more closely to actual practice and will most likely be spared from having to go thru multiple Tier 2 applications requests from the hundreds of Brazilian mills registered with CARB.

2 - Maritime Transportation

We remain very concerned that CARB staff continues to advocate for the inclusion of back-haul penalties for maritime transportation of sugarcane ethanol to California.

UNICA has not seen any data to support CARB's assertion that ocean tankers bringing ethanol fuel from Brazil to California will necessarily return empty to Brazil. CARB made clear that back-haul emission penalty is due to an overly conservative approach in case such empty (unlikely) return trips happen in the future so it can treat all biofuels fairly.

We verified our belief that ethanol ships from Brazil do not return empty and shared our findings with staff in the Exhibit C of our April 23, 2018 letter.

As the maps showed, nine ships have brought ethanol from Brazil to California, for a total of 10 trips (vessel High Valor has made the trip twice). From California, these vessels called other ports to deliver other products. The tracking of these vessels confirmed our observations that ships do not necessarily go back to Brazil, and certainly not empty. Out of 10 trips, only one went back to Brazil and it was carrying diesel. All other nine trips were to Asia, Europe, and Mexico.

Contrary to what CARB staff maintains, the back-haul penalty is not nominal for sugarcane ethanol. Back haul penalties correspond to nearly 46% of maritime emissions. Maritime transportation would be unaffordable and completely inefficient if vessels travelled empty around the world's oceans. Assuming the energy consumption and associated emissions of the ocean tanker's round trip be attributed to sugarcane ethanol is speculative and arbitrary. This

³ file:///Users/unica/Downloads/BoletimZdeZcana-de-acucarZ2Zlevantamento.pdf (page 48, 49)

approach causes a tremendous damage to sugarcane ethanol competitiveness in the California market.

We urge staff not to impose back-haul penalties on Brazilian sugarcane ethanol, since these penalties are not supported by data or shipping practices. Maritime logistics can be easily tracked, particularly now that the LCFS has third party verification. Additionally, UNICA would like to request that staff make available the evidence CARB has obtained to justify the imposition of such penalty on sugarcane ethanol.

3 - Tier 1 Calculator Technical Problems

It was brought to our attention that the Tier 1 calculator has technical problems that may impact certification procedures, deadlines and CIs for Brazilian sugarcane ethanol pathways.

We request CARB staff consider these points made by some of our mills and make the necessary adjustments to correct them. UNICA is at CARB's disposal to help coordinate communication with mills, if necessary.

The points needing attention and adjustment are:

1 - Tier 1 problems impact pathway registration process and deadlines.

a) The units of measurement generate problems in the calculations and, consequently, the Tier 1 spreadsheet of most mills is indicated as having problem by CARB.

i. "Calculator! F83" and "Calculator! G83" cells are in Liters per tonne but calculation generates result in Liter per ton short (907.18 kg). This problem can be solved by changing "Calculator! AN48" cell, from "0,00000110231" to "0,000001000000".

b) Misinterpretation of concepts leads to calculation problems

i. "Calculator! F81" and "Calculator! G81" cells treat sucrose as synonymous with fermentable sugar without proper adjustment to consider that only sucrose can be recovered as sugar production and that there is a chemical conversion factor of sucrose to fermentable sugar.

2 - Request for inadequate process parameter that compromises data validation process and information organization by plants. Following the exact data description of the following items may push the Tier1 calculator out of the optimization limits of the model leading to an error (model does not find a solution) Our mills can provide examples of such cases. Without a solved model, the certification process cannot start. On the other hand, not following the exact description may lead to invalidation of the pathway by the certification company.

a) The label of item 3.15: "Fraction Sucrose Entering Sugar Production (monthly weighted average) (4)" is leading to inconsistent interpretation and should be relabeled. A better representation would be: "ART content in sugarcane juice (after losses) divided by sugarcane crush". In the cells "Calculator! P35: P58", information on the ART content of the cane juice is requested to carry out calculations to validate the consistency of the data declared in the Tier 1

spreadsheet. However, this indicator is unusual in plant controls and, as a result, less reliable. We suggest that CARB adjust calculations to request information on the cane ART discounted from CONSECANAS-SP fixed factors for industrial losses.

- b) Still on cell G72, the model assumes that the quality (share of ART) that goes into sugar production is the same that goes into ethanol production. This incorrect assumption restricts the model and generates problems in cells F83 and G83. Cells O35:O58. Those cells require "Juice Allocated to Sugar Production (weighted average) (3)". However, this share should be calculated based on the share of ART that goes into sugar production, since ART concentration is (significantly) different in the juice that goes to sugar or ethanol production.

3 - Clarification of emission factors used to calculate emissions from maritime transport.

- a) the Tier 1 cell "EF Tables! F89" uses sea distance conversion with a unit factor of land miles that are 1,609 m per mile, but values for ocean miles are 1,852 m per mile. In case of error in the unit of measurement, the impact on the CI of Brazilian mills will be + 1.5 gCO₂eq / MJ.

4 - Registration of Multiple Logistic Routes

Due to the geographical location of Brazil and some methodological choices made by CARB, logistics represent an important share of sugarcane ethanol emissions in the LCFS. The Tier 1 calculator does not allow for a single mill to register more than one logistic routes with different CIs. Due to this restriction, mills have to register the most conservative logistical route.

As a result, there is no benefit on choosing the most optimized logistic with lower CI. This is an unnecessary burden for the LCFS program (and ultimately to Californians) and does not help to guide better decisions taking into account their environmental costs.

Further, we understand there is precedent of this pledge in the LCFS program. In at least one case, a single renewable diesel facility has different CIs depending on the origin of its feedstock. We would very much welcome the opportunity to engage in this discussion with staff.

As we mentioned before, maritime logistics can be easily tracked, particularly now that LCFS has third party verification.

5 - N₂O Emissions from Soil

When it comes to estimating N₂O emissions from farming, the GREET3.0 Tier 1 calculator points to around 15% of the CI (gCO₂e/MJ) coming from N₂O emissions from soils. It seems highly overvalued when compared to the numbers seen in the literature. In this example below, it represents 8,85 over a 55 gCO₂/MJ sugarcane ethanol CI.

151	Sugarcane Molasses-based Ethanol			Juice-to-Sugar Share	67,1%
152	eGRID (Electricity Mix) region		29-Brazilian Mix	Value	Total Emissions (gCO2e)
153	Feedstock Production	Sugarcane Farming			Cl, gCO2e/MJ
154		<i>Farming Energy, Btu/metric tonne cane</i>		95,000	8306,89666302434 per m.t. cane
155		Fertilizers and Agricultural Chemicals			8163,02660731458 per m.t.cane
156		N2O in Soil			13350,696647646 per m.t.cane
157		<i>N content above and below ground, g N2/tonne cane</i>		1,036	
158		Sugarcane Straw Burning in Field			
159		Sugarcane Transport to Mill			
160		<i>Cane transport by MDT, miles</i>		2,0	
161	<i>Cane transport by HDDT, miles</i>		22,9		
162	Filtercake Transport to Cane Farm				

In general, studies that consider N contained in the above (straw) and below-ground (roots) biomass, point to a conversion of 1% of N content from above ground biomass into N2O, and a not conclusive net balance (positive or negative) of below-ground biomass.

The quantities of N from sugarcane straw and roots of most studies found in the literature are estimated from a doctoral thesis (Franco, 2008) that carried out experiments in two areas of sugarcane cultivation in São Paulo state. It is also noted that some studies do not consider the N content of the roots due to the associated uncertainties.

Highly cited studies indicate that N2O emissions from soils are very dependent on field conditions, such as soil type and characteristics, climatic conditions, and management practices (Signor et al., 2013; Vasconcelos et al., 2018). The literature also indicates that research on the management of cultural waste is not conclusive regarding an increase or reduction in GHG flows. They estimated that the N2O emission factor resulting from the decomposition of straw is between 0.14% and 0.72%, while the Renovabio program uses a conservative rate of 1%.

In this sense, we suggest that CARB review this assumption and adopt a science-based premise. We indicate that emissions from ground biomass should be excluded (as recommended by few studies that pointed to its uncertainties), or in a conservative scenario, follow the same premise as Renovabio program, which considers a conversion rate of 1% of its N content being converted into N2O.

***It is also important to stress that is not clear where this very conservative factor of N2O emissions from soils used in GREET 3.0 is coming from.**

We urge staff to consider and implement our suggestions and ensure sugarcane ethanol is fairly scored in the Tier 1 calculator, so the greater number of mills use Tier 1 to register their pathways and export their product to California.

Additionally, considering the inconsistency related to the points listed above, the calculator does not work fluidly with the information provided by the mills and the registration process is taking more time than initially expected. In

this regards, we would also like to request that the current CI is maintained by CARB until the Agency makes a final statement regarding the processes submitted to CARB by December 31st, 2020.

We, once again, appreciate the opportunity to send you these comments. We remain at staff's disposal to work on any aspect of our suggested modifications, or to provide any additional data from the current experiences and anticipated trends in Brazil.

Sincerely,



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Representative-North America

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