BRAZILIAN SUGARCANE INDUSTRY ASSOCIATION

ETHANOL • SUGAR • ELECTRICITY

July 5, 2018

Sam Wade
Branch Chief, Fuels Section
Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Modified Text and Availability of Additional Documents and Information for the Proposed Amendments to the Low Carbon Fuel Standard Regulation and to the Regulation on Commercialization of Alternative Diesel Fuels

Dear Mr. Wade,

The Brazilian Sugarcane Industry Association ("UNICA") appreciates the opportunity to provide comments on the California Air Resources Board's proposed amendments to the LCFS, which was posted for comments on June 20th , 2018.

Brazil is the world's largest sugarcane producer and the second largest producer and exporter of ethanol with 22 percent of global production and 17% of exports in 2017.[1] Despite these volumes, sugarcane ethanol production uses only 0.6 percent of Brazil's territory[2] and reduces lifecycle greenhouse gas ("GHG") emissions by more than 100 percent[3] compared to conventional gasoline. Brazil's innovative use of ethanol in transportation and biomass for power cogeneration has made sugarcane a leading source of renewable energy in Brazil, representing 17.5 percent of the country's total energy supply, ahead of hydroelectricity.[4] Brazil replaced nearly one-third of its gasoline needs with sugarcane ethanol last year.[5]

UNICA is committed to helping CARB in meeting the goals of the LCFS by providing one of the lowest carbon intensive biofuels to be added to gasoline in use in California. Reducing dependence on GHG generating fossil fuels benefits the entire world, including the United States and Brazil. That is why UNICA works with CARB staff to continue supporting implementation of the LCFS, and why its members have provided volumes of low-GHG-producing sugarcane ethanol to help California meet LCFS goals.

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[1] Percentages calculated by UNICA, based on LMC Ethanol Monthly Update (March 2018).

[2] Brazilian Institute of Geography and Statistics ().

[3] Seabra, J. E. A., Macedo, I. C., Chum, H. L., Faroni, C. E. and Sarto, C. A. (2011), Life cycle assessment of Brazilian sugarcane products: GHG emissions and energy use. Biofuels, Bioprod. Bioref., 5: 519–532. doi:10.1002/bbb.289

[4] National Energy Balance – Base Year 2016 (2017).

[5] *Id.*

We recognize the effort of staff to try to make the pathway registration process more efficient and less complicated. For this reason, we urge the Board and ARB staff to carefully consider the letter of suggestions[6] UNICA delivered at the last Board meeting on April 23rd. We believe we have included valuable and important suggestions that need to be implemented in order to help California better capture the reality of the domestic sugarcane ethanol industry and reap the benefits of this low carbon intensive biofuel, so we urge you to take them into consideration before finalizing any adoption of amendments.

In addition to the comments submitted on April 23rd, we would like to bring two main issues to the Board for careful consideration, these are both related to the amendments to the Tier 1 simplified CI calculator for sugarcane-derived ethanol:

1 - Maritime Transportation

Unfortunately CARB continues to insist on the notion of back-haul penalties for maritime transportation of sugarcane ethanol to California. It is unknown to us that CARB has obtained data to support its assertion that ocean tankers bringing ethanol fuel from Brazil to California will necessarily return to Brazil, and empty. From conversations with staff we understood that this back-haul emission penalty is due to a conservative approach staff wants to take in case this happens in the future. We decided to verify our observations that ethanol ships from Brazil do not return empty and would like to present our findings to staff in the Exhibit C of April 23, 2018 letter[7]

As the maps show, in the past two years 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 was back to Brazil, with the vessel carrying diesel. All other nine trips were to Asia, Europe and Mexico.

Maritime transportation would certainly not be efficient and affordable if vessels would travel empty around the world. Assuming that the energy consumption and associated emissions of the ocean tanker's round trip be attributed to sugarcane ethanol is highly speculative and arbitrary and causes a tremendous impact in sugarcane ethanol competitiveness in the California market. We urge staff not to consider the emission of shipments returning to Brazil, since it defers from current market and trading practices. Additionally, UNICA would like to request that staff specify what type of evidence CARB has obtained to justify such penalty on sugarcane ethanol.

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[6] UNICA's letter to CARB of April 23, 2018: https://bit.ly/2KJFEKO

[7] UNICA's Letter to CARB of April 23, 2018, pages 23-32: https://bit.ly/2KJFEKO

II- Mechanization

One input in the calculator that is of great importance to the Brazilian sugarcane sector is the mechanization input, given the advances and investments that the industry has made in this front in the last decade and the competitive advantages that set mills apart from their peers. We see that the version of the calculator posted online on June 20th does not allow for site-specific mechanization input and we urge staff to include this option before finalyzing the amendment adoption process.

According to the State-owned Brazilian Food Supply Company (CONAB in Portuguese), from the Ministry of Agriculture, Livestock and Food Supply (MAPA), the South-Central region, where the majority of UNICA members operate, has reached 95.6% of mechanization level in 2017/2018 crop year, compared to 28,5% one decade ago[8]. Indeed, this index is even higher according the Sugarcane Technology Center (CTC). Following its data, the mechanical harvesting in areas owned by mills, located in South Central region, reached 98% in the named season.

It is important to mention that this is the region responsible for all the ethanol exported from Brazil to countries such as the United States, Japan and the European Union.

As CARB is aware, São Paulo state government, in partnership with UNICA and sugarcane growers association (ORPLANA), created in 2007 a Green Ethanol Protocol, a pioneer initiative that, among other commitments, eliminated pre-harvest field burning in 2017. According to the Environmental Secretary, 95% of all sugarcane processed in the São Paulo state is under the management of certified parties.[9] Since June 2017 this commitment has entered into a new phase, now called More Green Ethanol Protocol, that continues to reiterate the pre-harvest field burning commitment, but includes the important commitment of restoring reparian vegetation around cane fields.

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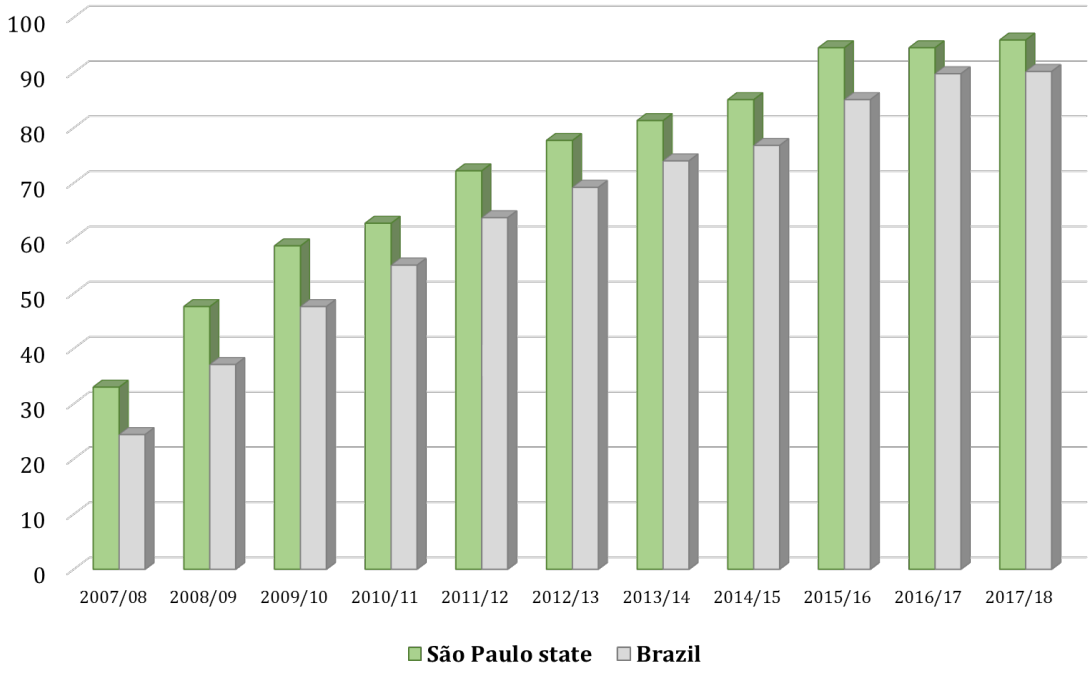
[8] http://www.conab.gov.br/OlalaCMS/uploads/arquivos/17_08_24_08_59_54_boletim_cana_portugues_-_2o_lev_-_17-18.pdf (page 60)

[9] Slide 3 of the document: http://arquivos.ambiente.sp.gov.br/etanolverde/2017/06/etanol-verde-relatorio-preliminar-safra-16_17-site.pdf

Sugarcane Harvesting– Fast Mechanization Process in Brazil



Source: CONAB (National Supply Company, from the Brazilian Ministry of Agriculture, Livestock and Food Supply

As previously mentioned, industry has invested a great deal in mechanization in the sector in the last decade. Investments that helped sector reach a level of 57% of GHG emissions reduction from harvesting over the past 10 years (from 4.8 to 2.1 g CO_2eq/MJ of ethanol), considering the parameters given in Table 1. We believe there is strong evidence that the soil carbon stocks increase due to unburned mechanized harvesting[10]. Estimations from Figueiredo and La Scala Jr (2011)[11] indicate that the emissions in the mechanized harvesting are almost 1500 kg CO_2eq ha^{-1} $year^{-1}$ lower than those for the burned harvesting, since it leads to a soil carbon sequestration of more than 1170 kg CO_2eq ha^{-1} $year^{-1}$.

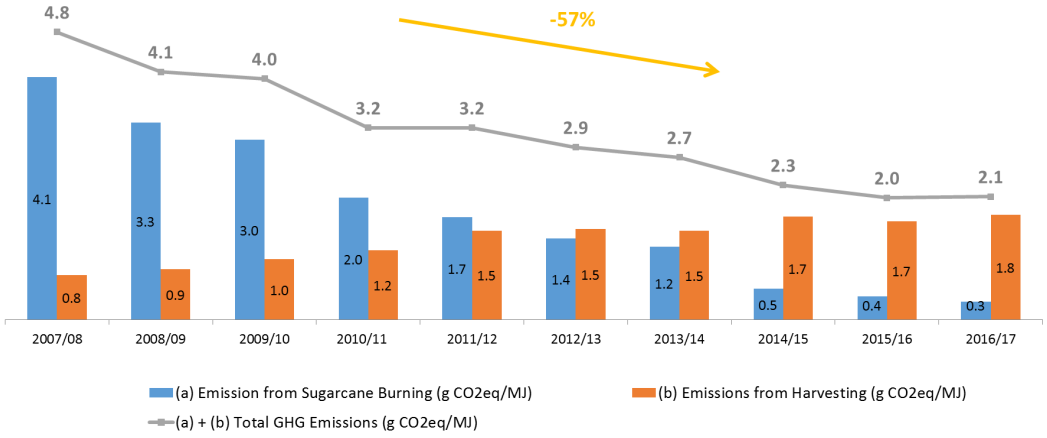
Table 1: Parameters used for the estimation of emissions balance between burned and mechanized harvesting

[10] Cerri, C. C., Galdos, M. V., Maia, S. M. F., Bernoux, M., Feigl, B. J., Powlson, D. and Cerri, C. E. P. European Journal of Soil Science; Special Issue: Soil Organic Matters; Volume 62, Issue 1, pages 23–28, February 2011

[11] Figueiredo EB, La Scala Jr N. Greenhouse gas balance due to the conversion of sugarcane areas from burned to green harvest in Brazil. Agriculture, Ecosystems and Environment 141 (2011): 77-85.

Parameter	Value/source
% Mechanized harvesting	CONAB
Sugarcane production	UNICA[12]
Sugar and ethanol production	UNICA[12]
Straw burning emissions	2.7 kg CH_4/t dry matter burnt[13]
	0.07 kg N_2O/t dry matter burnt[13]
Straw to cane stalk ratio	140 kg (dry basis) per tonne of stalk[14]
Harvester's diesel consumption	74 L/ha [15]
Life cycle diesel emissions	83.8 g CO_2eq/MJ [16]

Emissions Balance (Burning vs. Mechanization)



In the CI calculator for sugarcane ethanol, CARB proposes two default values for sugarcane mechanization for Brazil: 80% for São Paulo state and 65% for other states in the Center-South region. By choosing to use the default values, mills will not need to have this input verified. UNICA will probably have members who will be satisfied using the default value, however, the vast majority of our members located

[12] http://www.unicadata.com.br/

[13] IPCC 2006, 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Prepared by the National Greenhouse Gas Inventories Programme, Eggleston H.S., Buendia L., Miwa K., Ngara T. and Tanabe K. (eds). Published: IGES, Japan.

[14] Hassuani SJ, Leal MRLV, Macedo IC. Biomass power generation: sugar cane bagasse and trash. Piracicaba: PNUD Brasil and Centro de Tecnologia Canavieira; 2005.

[15] Adapted from Macedo IC, Seabra JEA, Silva JEAR. Green house gases emissions in the production and use of ethanol from sugarcane in Brazil: The 2005/2006 averages and a prediction for 2020. Biomass and Bioenergy 32 (2008): 582-595.

[16] European Parliament and Council of the European Union, Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009, on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC, Official Journal of the European Union of 5 June (2009).

in Sao Paulo, who have nearly all of its sugarcane harvesting mechanized, and a considerable number of members in other states, prefer to prove that they are at highest level of mechanization, as abovementioned reported by CONAB and CTC.

For this effect, UNICA would like to request, once again, that CARB includes an option for self-declared mechanization percentage in the CI calculator, we are aware that mills opting for it will have its data and its mill audited by a CARB authorized third party verification body. In the April 23rd letter[17] to CARB, Exhibit A, UNICA has suggested an outline for proving mechanization levels in Brazil, we encourage staff analyze it and make a decision on the process in order to include the site-specific input as soon as possible.

UNICA member mills, who represent the vast majority of Brazilian mills registered with CARB, are highly sophisticated enterprises who invest a great deal in the automatization of their agricultural and industrial processes. Third party verifying bodies in Brazil have, for years, audited mills' systems for certification schemes like the Bonsucro, EPA's RFS program and the LCFS in itself. We encourage CARB staff to continue to reach out to verification companies in Brazil, as well as to regulatory agencies in the country, in order to clarify doubts or misunderstanding regarding the automatized systems used by sugarcane mills.

We believe providing these options are not only the best way to capture the reality of sugarcane mechanization practices in Brazil, but it is also the fairest approach to allow Brazilian ethanol to compete in the Californian market.

We commend CARB for its efforts to simplify and make the LCFS registration process more efficient. We want to make sure that the amendments proposed will indeed have these consequences and will allow for a closer-to-reality carbon intensity number for sugarcane ethanol. We would like to see more volumes of low carbon Brazilian sugarcane ethanol entering the Californian market. We urge CARB to consider our suggestions and ensure that sugarcane ethanol is fairly scored in the GREET-CA 3.0 modeling and that Californian consumers reap the benefits of sugarcane ethanol. We are at staff's disposal to work in any aspect of our suggested modifications, or to provide any additional data from the current experiences and anticipated trends in Brazil.

Sincerely,

Leticia Phillips

Representative-North America

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[17] April 23, 2018 UNICA's letter to CARB, Exhibit A, page 12: https://bit.ly/2KJFEKO