BRAZILIAN SUGARCANE INDUSTRY ASSOCIATION
ETHANOL • SUGAR • ELECTRICITY

September 15, 2014.

Via Electronic Mail

Wes Ingram
Manager, Fuels Evaluation Section
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Dear Mr. Ingram:

The Brazilian Sugarcane Industry Association (UNICA) appreciates the opportunity to provide comments on the California Air Resources Board's (CARB) update on CA-GREET model used for the Low Carbon Fuel Standard (LCFS) program and the carbon intensity (CI) of the different fuels that are part of the program. UNICA's comments are based on the information provided at the August 22nd CARB's workshop as well as in the GREET1_2013, available at the Argonne National Laboratory website.

UNICA is the largest representative of Brazil's sugar, ethanol, and bioelectricity producers. Its members are responsible for more than 50% of Brazil's ethanol production and 60% of Brazil's sugar production. UNICA's priorities include serving as a source for credible scientific data about the competitiveness and sustainability of sugarcane biofuels. UNICA also works to encourage the continuous advancement of sustainability throughout the sugarcane industry and to promote ethanol as a clean, reliable alternative to fossil fuels. Sugarcane ethanol production uses less than 1.5% of Brazil's arable land and reduces lifecycle greenhouse gas ("GHG") emissions by up to 90% on average, compared to conventional gasoline. Also, thanks to our innovative use of ethanol in transportation and biomass for power cogeneration, sugarcane is now a leading source of renewable energy in Brazil, representing over 15% of the country's total energy needs. The industry is expanding existing production of other renewables products and, with the help of innovative companies here in the United States and elsewhere, is beginning to offer bio-based hydrocarbons that can replace carbon-intensive fossil fuels and chemicals.

UNICA appreciates the effort that you and your colleagues continue to put into this process in order to improve the LCFS and we remain committed to work with the staff to provide input and feedback regarding the dynamics of Brazilian agriculture and the sugarcane industry.

The information released by CARB at the August 22nd workshop says that CA-GREET 2.0 is based on Argonne's GREET 1 2013 (not CA-GREET 1.8b), and included updates from both ARB staff and Argonne National Laboratory. According to CARB, life cycle analysis (LCA) inventory data updates for fertilizer production and farming, and fuel production energy were considered important for sugarcane ethanol, so was soil N2O emissions.

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CA-GREET 2.0 results for the three pathways considered in Model Version 1.8 b, and one more pathway (Mechanized Harvest only) included in the new version are as follows:

Tentative direct CI differences for sugarcane ethanol

	Model Version		
Sugarcane Ethanol Pathway	**1.8b**	**2.0**	**Change**
No Harvest or Electricity Credit	27.40	34.55	7.15
Mechanized and Power Export	12.40	23.30	10.90
Mechanized Harvesting only	--	29.52	--
Power Export only	20.40	28.33	7.93

According to the workshop's presentation and handouts, the primary drivers of CI differences (for sugarcane ethanol) are fertilizer use and soil N2O emissions.

Since CA-GREET 2.0 is not publicly available, UNICA was not able to fully replicate the results for sugarcane ethanol presented at the workshop (slide 12)[1] using GREET1_2013 "default" data or using our available data. We would like to request that CARB staff make ***all assumptions used in CA-GREET 2.0 available for the stakeholders.*** Also, we are informed that several parameters in the GREET Model were changed (like the ones we were able to identify and are described below). *Our suggestion is that CARB releases the complete list of changes in input parameters used with the corresponding justifications; so we can compare them with our information, and discuss the relevant points in further detail.*

Given that we were unable to reproduce the results presented at the workshop, the following comments are based on the comparison of GREET1_2013 with its previous version (GREET1_2012):

(a) GREET1_2013 considers that sugarcane ethanol exported from Brazil to US is transported exclusively through trucks from the ethanol plant to the port terminal. The model's previous version had considered 50% through railway and 50% through pipeline. In the present harvest about 15% of ethanol exports are transported through railways, mainly from Parana State. Looking at the Brazilian ethanol pipeline, the leg from the city of Ribeirão Preto to Paulinia (almost 150 miles long), both in the State of São Paulo, is already operational, and the leg from Ribeirão Preto to Uberaba, in the state of Minas Gerais is almost concluded (additional 85 miles). The pipeline will operate at full capacity when the Paulinia-Guarujá leg is finished and we estimate that this leg will be operational in 2 to 3 years, which shall allow export volumes of more than 500 million gallons per year. Once this happens, almost 90% of the Brazilian ethanol will be exported through railway and pipeline. Given the short time-frame for these investments to mature, we

[1] ARB Workshop Presentation available at: http://www.arb.ca.gov/fuels/lcfs/lcfs_meetings/082214presentation.pdf

would like to recommend ARB to consider 50% exports through trucks and 50% through railway and pipeline.

(b) GREET1_2013 has included above/below biomass, vinasse and filter cake in N20 emissions. There are several experiences in Brazil to make viable sugarcane biomass collection for energy generation, besides the amount already collected in mechanized harvest. Some mills are exploring possibilities to collect 50% of the biomass but the main bottleneck is collection costs. Given that biomass collection is a top priority for ethanol producers in Brazil, we would like to recommend ARB to create a pathway with 50% biomass collection. This pathway can be implemented without major difficulties in GREET1_2013.

(c) GREET1_2013 has attempted to correct the amount of energy used in sugarcane farming due to higher rate of mechanical harvesting. The previous number was updated from 41.592 Btu/tonne of sugarcane to 95.000 Btu/tonne of sugarcane. Our main concern with this number is that it does not oscillate according to the proportion of sugarcane harvested with manual cutting. The consumption of 95.000 Btu/tonne sounds reasonable for a 100% mechanized sugarcane field but is certainly high for 40% mechanized field as is GREET1_2013 default. Therefore either ARB adapt the energy use in farming to the level of mechanized harvesting assumed, or a 100% mechanized scenario is assumed as default.

(d) We also noticed that GREET1_2013 has brought changes in fossil fuels emissions, which might have leaded to higher emissions in ethanol sugarcane and ethanol production compared to the previous version. We were not able to isolate this effect and we kindly request that CARB clarifies this point for us.

(e) Although iLUC is not a topic addressed in the direct emissions, UNICA follows this subject very closely because iLUC continue to be the largest source of emissions in sugarcane ethanol. We recognize the efforts made by ARB updating the original 2009 analysis, but we still have several concerns about the preliminary results published earlier this year. Even with the reduction from 46 to 26 g CO2eq/MJ, both in GTAP simulations, but mainly in the emissions calculation model, we have identified several problems, especially in light of recent documents published in international journals bringing new empirical evidences that should be incorporated in ARB analysis as soon as possible. We will be glad to discuss this issue with staff as soon as the ILUC workshop is schedule this year.

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UNICA appreciates the opportunity to submit these preliminary comments. UNICA members and staff look forward to the opportunity to continuing to work with CARB to fully achieve the economically and environmentally beneficial goals of the LCFS in California. UNICA is ready to provide further information or answer any questions CARB may have about the details of these comments or the Brazilian sugarcane ethanol industry.

Respectfully submitted,

Elizabeth Farina
President and CEO

Leticia Phillips
Representative – North America