UNICA
BRAZILIAN SUGARCANE INDUSTRY ASSOCIATION
ETHANOL • SUGAR • ELECTRICITY

15-2-4
Leticia Phillips

February 17, 2015

VIA ELECTRONIC MAIL

John Courtis
Manager, Alternative Fuels Section
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: UNICA's Comments on California Air Resources Board's (CARB) Staff Report: Initial Statement of Reasons.

Dear Mr. Courtis:

The Brazilian Sugarcane Industry Association ("UNICA") appreciates the opportunity to provide comments on the California Air Resources Board's CARB) Staff Report: Initial Statement of Reasons, which was posted for comments on December 31st, 2014.

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. 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 renewable products, and with the help of innovative companies here in the United States and elsewhere, is beginning to offer bio-based hydrocarbons to replace carbon-intensive fossil fuels and chemicals.

UNICA recognizes the amount of work CARB staff has done throughout 2014 culminating with the issuance of this report, and we continue to support your work

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improving the Low Carbon Fuel Standard by requesting input and welcoming the cooperation of stakeholders like UNICA. For the purpose of this letter, we would like to comment on two specific appendix of the study: A) Appendix C Comparison of CA-GREET 1.8B, GREET1 2013, and CA-GREET 2.0; and B) Appendix I Detailed Analysis for Indirect Land Use Change.

A) Appendix C: Comparison of CA-GREET 1.8B, GREET1 2013

We were disappointed to see CARB staff's decision to opt for using average electricity mix instead of the marginal mix in Brazil's sugarcane ethanol production for a few reasons. As per your report, the reason for this change is to provide better accuracy for power plants in the U.S. to find their region-specific electricity resource mix and calculate the carbon intensity (CI) of their electricity use. In order to do that, CARB adopted the U.S. Environmental Protection Agency's (EPA) Emissions & Generation Resource Integrated Database (eGRID), 9th edition Version 1.0 for the different regions in the U.S., and included Brazil as the only international eGRID region (Region 29). The more we analyze this proposal, the more it does not make sense for Brazilian industry. Perhaps the average mix approach may make sense for U.S. power plants because the plants take energy from the grid, but this situation is very different compared to the Brazilian model. During the harvest season, sugarcane mills in Brazil are 100% self-sufficient in electricity, so mills consume nothing from the general electricity grid. On the contrary, the electricity unused by the mills is sold into the national grid, contributing as a clean source of power to the grid by displacing the marginal increase of dirtier sources. According to the Brazilian Agriculture Ministry, in December 2013 there were 389 sugarcane mills in Brazil, all of them producing energy for self-consumption and we estimate that about 170 of these mills sell excess electricity into the grid.

The Brazilian electrical system (National Interconnected System - SIN) is 98.3% interlinked, so virtually all the production and transmission of electricity in Brazil happens on one main grid closely monitored by the National Electric System Operator (ONS), a federal agency responsible for coordinating and controlling operation of the electricity generation and transmission facilities in the SIN under the supervision and regulation of the National Electric Energy Agency (ANEEL). This unique system adopted by the country creates certainty as to what sources contribute to the marginal generation of power. Sugarcane biomass-based electricity in Brazil receives a fixed income to deliver a "package" of energy per year to the grid. Sugarcane biomass receives this fixed income for the energy it produces and declares its Unit Variable Cost (UVC) equal to zero, since co-generation of sugarcane biomass electricity occurs in order to meet the demand of the sugar and ethanol production in the mill. Wind and solar sources also have a UVC equal to zero. In this way, all the electrical energy these sources produce are made available to the national grid (since the government already paid a fixed income for it).

The process is different for thermo-gas sources. On top of the fixed income they receive to be on stand by, their UVC is greater then zero, meaning if and when the ONS utilizes them, they receive payment for their fuel cost and the operation. In fact, since sugarcane biomass is classified with a unit variable cost equal to zero, the ONS adopts the so-called merit order, where thermal plants from lower to higher operating costs are dispatched in order to meet demand. The ones with lower UVC are the first to be called to meet domestic demand. Since biomass plants have unit variable cost equal to zero, when available (during the sugarcane harvest season), they are the first to be dispached to the system, without the need of an order from the ONS. Differently from sources like coal, diesel, and natural gas, the generation of energy of sugarcane biomass sources is controlled and dictated by the industrial process itself instead of by order of the national operator.

Another important point to remember is during the dry season, when Brazil's reservoirs are at their lowest level, the system is heavily relient on thermo-gas sources, in order to guarantee the security of the system. This is when sugarcane harvesting season and co-generation is at peak, so given the lower operational cost of biomass electricity, this source substitutes for natural gas at the margin.

The graphs below show from 2007 to 2014, the share of hydropower in Brazil decreased significantly, mainly due to droughts that have significantly impacted reservoirs and due to the reduction of the multiannual regulating capacity of the hydroelectric reservoirs, since the most recent hydropower projects in Brazil are composed of "thread-of-water" mills, mills that are only able to hold water for a few hours or days.[1] According to the Brazilian Ministry of Mines and Energy's (MME) 10-year Energy Expansion Plan (PDE 2023), this decreasing trend is predicted to continue, and Brazil has relied (and will rely) especially heavily on thermo-gas sources to provide the marginal power it needs, and to guarantee the security of the electrical system in the country[2]. Since sugarcane mills operate on a fixed revenue basis described above with zero Unit Variable Cost (UVC), we know bagasse-burning electricity cogeneration goes straight into the grid, to substitute the marginal increase of energy. If we look at the marginal sources that have increased over the last few years, we see natural gas has the largest share in the system. Given the operational cost differential between biomass and thermo-gas sources, the seasonality of hydro and biomass energy generation and the fact that hydro mills have a decreased capacity of holding water, we know bagasse electricity cogeneration is displacing fossil fuel sources of power in Brazil, in the daily operation system.

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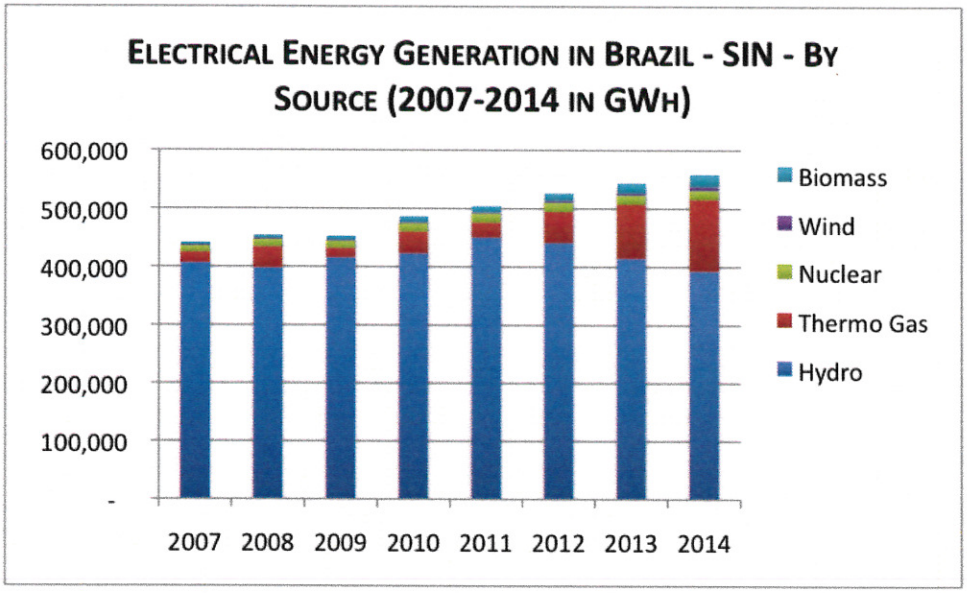
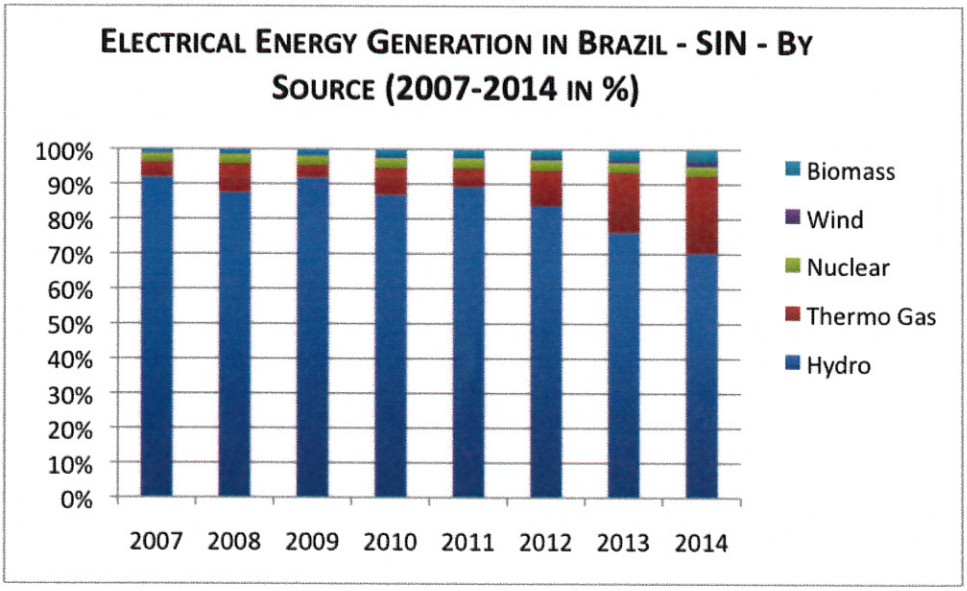
[1] The Brazilian Ministry of Mines and Energy published in 2014 the Brazil 10-year Energy Expansion 2023 Plan (Plano Decenal de Expansão de Energia 2023 –PDE) , available in Portuguese at: http://bit.ly/1F5IIaW, for more information on reservoir capacity see pages 84 and 85.

[2] PDE 2023 page 396.





Notes: Source (Hydro, Wind, Nuclear and Thermo Gas): ONS 2015 available online at http://bit.ly/1zPCNDr
Biomass from 2007-2009: Data from the National Energy Balance for corresponding year – Ministry of Mines and Energy.
Biomass from 2010-2014: Source CCEE (2015) available online at http://bit.ly/1EhnDq0

We urge CARB to continue to adopt the marginal source of electricity for sugarcane pathways. By adopting energy average mix, CARB is not only taking the wrong approach, but is also turning its back on one of the greatest environmental benefits of sugarcane pathways. There is no doubt in our minds that such a position by CARB would discourage carbon mitigation behavior in Brazil and elsewhere.

Another very important point for consideration is that CARB adopted the U.S. Energy Information Administration's (EIA) data for Brazil's 2011 electricity generation, while the government of Brazil publically displays its data on electricity generation by fuel type on a very up-to-date fashion. As the graphs above show, Brazil's energy matrix includes significantly less hydro today than in 2011, and we believe this decreasing trend will prevail for years to come. The current reality for renewable and fossil sources of energy in the Brazilian energy matrix is very different from the one pictured by EIA, and regardless of the position CARB adopts, this average mix of electricity data should to be updated with the most current numbers available.

B) Appendix I: Detailed Analysis for Indirect Land Use Change

We were glad to see the iLUC penalty number reduced for sugarcane ethanol, as we believe this reflects the effort of CARB staff throughout the years in improving iLUC modeling under the LCFS. We believe some changes adopted by staff, like the new land supply structure for GTAP ("Approach B"), allow us to improve the iLUC analysis by identifying with much more accuracy how pastures and forests respond to cropland expansion, an important improvement for regions with large stocks of pastureland and forests like Brazil.

Despite these positive changes, UNICA would like to once again stress the urgent need for CARB staff to capture crop production expansion based on double-crop systems (soy-corn and soy-cotton, in Brazil's case). During the September 29, 2014 seminar, CARB staff indicated crop and region-specific YPE is the possible solution for representing double cropping within GTAP, but once again CARB ran scenarios of equal values for the different regions of GTAP. We sympathize with CARB staff on the difficulty finding accurate double-cropping data for all regions of the world, however, Brazil has compiled this data for some time and UNICA has provided this information to CARB in previous correspondences. As mentioned in our October 15, 2014 letter, UNICA has run scenarios using a YPE value of 0.35 with encouraging results: less area allocated to crops (due to higher yields) and higher share of cropland expansion in Brazil (cropland expansion is a consequence of the shock on ethanol production). UNICA urges CARB to set a YPE value of 0.35 for soy and corn in Brazil in order to capture the effects of double cropping and improve iLUC analysis even further. We maintain that CARB needs to incorporate this tropical land-saving practice occurring in Brazil in its iLUC analysis. We remain at staff's disposal to provide available data and make necessary introductions to Brazil's government and academia for better explanation and confirmation of this phenomenon to CARB.

We appreciate the opportunity to submit these comments, and as we have done in the past, will continue to engage with CARB staff to provide additional input and feedback on the LCFS. We are pleased to see CARB continuing to improve the LCFS and we are glad to be part of this process by cooperating with the agency and serving as a

credible source of information about the Brazilian biofuels industry. We remain committed to continue our collaboration with CARB and we look forward to the opportunity to discuss these comments in detail with you.

Respectfully Submitted,

Elizabeth Farina
President & CEO

Leticia Phillips
Representative – North America

Electrical Energy Generation _Brazil - National Interlinked System, by Source, 2007-2014 (in GWh)

Fontes	2007	2008	2009	2010	2011	2012	2013	2014
Hydro	406,084	397,702	415,686	422,893	450,237	441,178	414,556	392,585
Thermo-Gas	18,669	36,489	16,307	37,497	25,982	53,405	93,104	123,621
Thermo-Nuclear	12,307	14,006	12,957	14,515	15,659	16,038	15,450	15,378
Wind	559	557	712	1,472	1,902	3,192	3,957	6,561
Thermo-Biomass	4,008	5,523	7,337	10,414	10,744	12,953	17,148	20,732
Total	441,627	454,277	452,999	486,791	504,524	526,767	544,214	558,877

Obs.:

De 2007 a 2014 para hídrica, térmica convencional, térmica nuclear e eólica: fonte ONS (2015). Disponível online em: http://www.ons.org.br/historico/g

De 2010 a 2014 para térmica a biomassa: fonte CCEE (2015). Disponível online em: http://www.ccee.org.br/portal/faces/pages_publico/quem-somos/in

De 2007 a 2009 para térmica a biomassa: dados obtidos a partir de Balanços Energéticos Nacional - Ministério de Minas e Energia.

Dados de geração das térmicas a biomassa incluem bagaço de cana e outras biomassas. Contabiliza apenas a geração ofertada para o Sistema Interligadc

Electrical Energy Generation _Brazil - National Interlinked System, by Source, 2007-2014 (in %)

Fontes	2007	2008	2009	2010	2011	2012	2013	2014
Hydro	92%	88%	92%	87%	89%	84%	76%	70%
Thermo-Gas	4%	8%	4%	8%	5%	10%	17%	22%
Thermo-Nuclear	3%	3%	3%	3%	3%	3%	3%	3%
Wind	0%	0%	0%	0%	0%	1%	1%	1%
Thermo-Biomass	1%	1%	2%	2%	2%	2%	3%	4%
Total	100%	100%	100%	100%	100%	100%	100%	100%

eracao_energia.aspx
formacoesmercado/info_mercado?_afrLoop=418725877334790

› Nacional.