



BRAZILIAN SUGARCANE INDUSTRY ASSOCIATION

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May 23, 2013

VIA ELECTRONIC MAIL

Committee on Energy and Commerce
United States House of Representatives
Washington, DC 20515

Re: UNICA's Comments on "Renewable Fuel Standard Assessment White Paper: Greenhouse Gas Emissions and Other Environmental Impacts"

To Whom It May Concern:

The Brazilian Sugarcane Industry Association ("UNICA") appreciates the opportunity to provide these comments in response to the Committee on Energy and Commerce's *Renewable Fuel Standard Assessment White Paper: Greenhouse Gas Emissions and Other Environmental Impacts* ("RFS White Paper").

UNICA is the largest organization representing sugar, ethanol, and bioelectricity producers in Brazil. UNICA's members are responsible for more than 50% of all ethanol production in Brazil and 60% of overall sugar production. UNICA's priorities include serving as a source for credible scientific data about the competitiveness and sustainability of sugarcane biofuels. The association 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 0.5% of Brazil's total land and reduces greenhouse gas ("GHG") emissions by over 60%, compared to conventional gasoline, based on the U.S. Environmental Protection Agency ("EPA")'s methodology. And 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 about 15% of the country's total energy needs. The scope of the industry is expanding existing production of renewables and bioplastics 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.

The sugarcane ethanol produced by UNICA's members provides significant GHG emissions reductions when compared to a gasoline baseline, and we are proud of the role that Brazilian sugarcane has played thus far in achieving the objectives and mandates of the RFS program. As demonstrated by EPA's own lifecycle analysis, the GHG emissions reductions associated with Brazilian sugarcane ethanol exceed the emissions thresholds for all categories of advanced biofuels included in the RFS program. Thus, in order to maintain and expand upon these important GHG benefits, UNICA urges Congress and EPA to maintain their commitment to the RFS program and its increasing mandates for advanced biofuels, such as Brazilian sugarcane ethanol.

In further response to the *RFS White Paper*, UNICA provides the following answer to the Committee's questions:

I. Is the RFS reducing greenhouse gas emissions below that of baseline petroleum-derived fuels? Is the RFS incentivizing the development of a new generation of lower greenhouse gas emitting fuels? Will the RFS produce further greenhouse gas emissions reductions when it is fully implemented?

Since Congress passed the Energy Independence and Security Act of 2007 ("EISA") and directed EPA to implement the RFS2 program, the RFS program has been responsible for significant reductions in GHG emissions below the petroleum-derived fuel baseline. One of the most significant provisions of the EISA was the creation of separate renewable fuel mandates for advanced biofuels, biomass-based diesel, and cellulosic biofuel, each of which offers superior GHG emission reduction benefits when compared to petroleum-derived fuels and corn ethanol alternatives. By creating a separate mandate for these renewable fuel products, the RFS program is boosting GHG emissions reductions and creating incentives for the development of new lower GHG emitting fuels that will qualify for these preferred renewable fuel categories. UNICA expects that the GHG emission reduction benefits of the RFS program will only continue to grow as the mandates for advanced biofuels increases each year.

UNICA is proud of the role that Brazilian sugarcane ethanol has played helping the United States to achieve its GHG emissions reduction goals under the RFS program. Sugarcane ethanol is the most efficient biofuel produced at a commercial scale and, as described below, can reduce GHG emissions by over 60% when compared to a fossil fuel baseline. Further, in response to programs such as the RFS, Brazilian sugarcane producers have made a long-term commitment to providing clean, renewable sugarcane ethanol to meet energy and environmental goals in Brazil and globally as evidenced by the considerable investments by major global energy companies, such as Shell, BP, Total and Petrobras, in the sugarcane industry. In fact, since the RFS2 program was instituted, Brazilian sugarcane ethanol producers have provided the vast majority of the undifferentiated advanced biofuels necessary to meet the RFS program's volume mandates.¹ UNICA expects that Brazilian sugarcane ethanol producers will continue to respond to the RFS program's increasing volume mandates by exporting greater volumes of ethanol to the United States in the coming years.

II. Could EPA's methodology for calculating lifecycle greenhouse gas emissions be improved, including its treatment of indirect land use changes? If so, how?

UNICA continues to support EPA's life cycle analysis ("LCA") for Brazilian sugarcane ethanol. LCAs from around the world have repeatedly shown that, when compared to the 2005 gasoline baseline, Brazilian sugarcane ethanol provides GHG benefits that equal or exceed the 60% emission reduction threshold for cellulosic biofuels.² These LCAs formed the basis for

¹ Thus far, undifferentiated advanced biofuels such as Brazilian sugarcane ethanol have also been required to account for the share of cellulosic ethanol mandate that has been waived by EPA in yearly rulemakings in accordance with the EISA.

² E.g., Wang, M. and M. Wu, "Life-cycle energy use and greenhouse gas emission implications of Brazilian sugarcane ethanol simulated with the GREET model." *International Sugar Journal* 110.1317 (2008): 527-45; Zuurbier, Peter and Jos Van de Vooren, eds. *Sugarcane Ethanol: Contributions to Climate Change Mitigation and the Environment*, (Wageningen, The Netherlands: Wageningen Academic, 2008); Macedo, I.C., Seabra, J., and J. Silva, "Greenhouse 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*, 32.7 (2008): 585-95.

EPA's approval of Brazilian sugarcane ethanol as an advanced biofuel in the final RFS2 Rule. 75 Fed. Reg. 14,670 (Mar. 26, 2010). More recent studies published after the RFS2 Rule continue to support EPA's conclusions regarding the GHG benefits of sugarcane ethanol.³

EPA's development of an LCA for Brazilian sugarcane ethanol included significant stakeholder involvement. In its comments on the proposed RFS2 Rule, UNICA provided EPA with a detailed assessment of the lifecycle GHG emissions associated with Brazilian sugarcane ethanol. The data provided by UNICA showed that Brazilian sugarcane ethanol reduces GHG emissions by up to 90% when compared to fossil fuels.⁴ UNICA also provided an extensive critique of EPA's assessment of the lifecycle GHG emissions of Brazilian sugarcane ethanol, which included detailed information regarding Brazil's agricultural and energy sectors and how they impact the lifecycle GHG benefits attributable to Brazilian sugarcane ethanol production.⁵ In response to UNICA's comments, EPA adjusted its assessment of lifecycle GHG emissions for Brazilian sugarcane ethanol, concluding that such emissions were likely reduced by more than 60% as compared to the gasoline baseline. 75 Fed. Reg. at 14,790-91. As a result, Brazilian sugarcane ethanol qualifies as an advanced biofuel under the RFS2 program and total lifecycle GHG emissions reductions exceed the 60% threshold for cellulosic biofuels.

In light of this open and transparent rulemaking process that developed the LCA for Brazilian sugarcane ethanol and its consistency with more recently published LCAs, UNICA is confident that EPA's LCA continues to accurately reflect the GHG emission reduction benefits associated with Brazilian sugarcane ethanol. Moreover, because EPA's initial LCA addressed indirect land use change, there is no need for further adjustments on that basis.⁶ As a result, no changes to EPA's LCA methodology are required for Brazilian sugarcane ethanol.

³ Seabra, J.E.A., Macedo, I.C., Chum, H.L., Faroni, C.E. and C.A. Sarto, "Life cycle assessment of Brazilian sugarcane products: GHG emissions and energy use," *Biofuels, Bioproducts, and Biorefining*, 5 (2011): 519–532. Khatiwada, D., Seabra, J., Silveira, S., and W. Arnaldo, 2012. "Accounting greenhouse gas emissions in the lifecycle of Brazilian sugarcane bioethanol: Methodological references in European and American regulations," *Energy Policy*, 47(C) (2012):384-397. Seabra, J.E.A. and I.C. Macedo, "Comparative analysis for power generation and ethanol production from sugarcane residual biomass in Brazil," *Energy Policy*, 39(1) (2011): 421-428. Souza S.P. and J.E.A. Seabra, "Environmental benefits of the integrated production of ethanol and biodiesel," *Applied Energy* (2012), available at <http://dx.doi.org/10.1016/j.apenergy.2012.09.016>. Paes L.A.D. and F.R. Marin, "Carbon storage in sugarcane fields of Brazilian South-Central region," *Centro de Tecnologia Canavieira [Centre for Sugarcane Technology]. Technical Report*, (Piracicaba, São Paulo, 2011), available at <http://www.unica.com.br/download.php?idSecao=17&id=16900437>. Joaquim, A.C., Bertolani, F.C., Donzelli, J.L., and R.M. Boddey, "Organic Carbon Stocks in Soils Planted to Sugarcane in the Mid-South Region of Brazil: A Summary of CTC's Data, 1990-2009," *Centro de Tecnologia Canavieira [Centre for Sugarcane Technology]. Technical Report*, (Piracicaba, São Paulo, 2011), available at <http://www.unica.com.br/download.php?idSecao=17&id=18105453>.

⁴ See, e.g., Zuurbier and Jos Van de Vooren (2008).

⁵ *Id.* at 9-10, 16-34.

⁶ Recent studies have confirmed EPA's assertion in the LCA that Brazilian sugarcane production would primarily displace existing pasture lands. See, e.g., Lapola, D., Schaldach, R., Aclamo, J., Bondeau, A., Koch, J., Koelking, C., and J. Priess, "Indirect land-use changes can overcome carbon savings from biofuels in Brazil," *Proceedings of the National Academy of Science*, 107 (2010): 3388-3393. See also Adami, M., Freidrich, B., Rudorff, T., Freitas, R.M., Aguiar, D.A., Sugaware, L.M., and M.P. Mello, "Remote Sensing Time Series to Evaluate Direct Land Use Change of Recent Expanded Sugarcane Crop in Brazil," *Sustainability*, 4 (2012): 574-585. However, due to increase in efficiency and cattle density on

UNICA believes that EPA has the necessary authority to adjust the RFS to ensure that the desired GHG reduction is achieved. One example where EPA could act to improve the level of GHG reduction would be to phase out the grandfathering provision for conventional renewable fuels. Under EISA, all renewable fuels must meet the 20% GHG reduction criterion except those facilities that began construction prior to December 2007. EPA has “grandfathered” these facilities, exempting them from the 20% GHG reduction requirement but has not determined whether the grandfather clause would sunset in the future. UNICA believes that by requiring all renewable fuels to meet the minimum 20% GHG reduction, EPA would be sending a clear signal to the U.S. and global industry that additional GHG reduction is necessary. This could have the added benefit of encouraging some of the older facilities, which are currently benefiting from the “grandfather clause”, to upgrade their processes to either produce lower carbon intensity ethanol or shift to drop-in renewable fuels that would be fungible with the existing motor vehicle infrastructure.

III. Is the definition of renewable biomass adequate to protect against unintended environmental consequences? If not, how should it be modified?

UNICA believes that the definition of renewable biomass is adequate to protect against unintended environmental consequences in Brazil. There is no dispute that Brazilian sugarcane ethanol meets the EISA's statutory definition of a renewable biomass feedstock, as it is a “planted crop” that has been “harvested from agricultural land” that was under cultivation prior to December 2007 and remains “actively managed.” See 42 U.S.C. § 7545(o)(1)(I). At this time, sugarcane production uses only 1% of Brazil's territory and growth in sugarcane production has occurred primarily on pasture lands that have been maintained as agricultural land since well before 2007. Moreover, changes in production practices associated with the “Green Ethanol Protocol”⁷ and other voluntary and regulatory programs in Brazil have reduced the environmental impacts associated with sugarcane production. As a result, the environmental impacts associated with Brazilian sugarcane ethanol production are even less than what was anticipated when the EIA was passed and the RFS2 regulations were implemented.

At the same time EPA's implementing regulations impose onerous requirements on foreign renewable fuel producers seeking to prove that their feedstocks meet the definition of renewable biomass. These regulations add significant costs and uncertainty for sugarcane ethanol producers and importers as well as the companies who purchase and ultimately retire the RINs generated by Brazilian sugarcane ethanol. To reduce the high transaction costs associated with establishing that Brazilian sugarcane qualifies as renewable biomass under the EISA, UNICA urges Congress and EPA to expand the aggregate compliance mechanism currently afforded to domestic renewable fuel producers. See 40 C.F.R. §§ 80.1454, 80.1457. By expanding the aggregate compliance mechanism to include Brazilian sugarcane, producers could demonstrate compliance with the definition of renewable biomass based on nationwide production, rather than requiring chain-of-custody recordkeeping for each sugarcane farm

pasturelands, excess pasture land has been available to meet increased demand for Brazilian sugarcane ethanol.

⁷ The “Green Ethanol Protocol” is a voluntary agreement signed between mills, sugarcane suppliers, and the State of São Paulo to end the practice of sugarcane field burning several years ahead of what is called for in existing legislation. Today 73% of the cane harvested in São Paulo state is mechanized. The Green Protocol also establishes benchmarks for water conservation, maintenance and recomposition of riverside vegetation.

supplying ethanol mills. By streamlining the recordkeeping and reporting requirements currently required by the RFS2 regulations, Congress and EPA can further incentivize the production of Brazilian sugarcane ethanol and increase the associated environmental benefits.

IV. What are the non-greenhouse gas impacts of the RFS on the environment relative to a comparable volume of petroleum-derived fuels? Is there evidence of a need for air quality regulations to mitigate any adverse impacts of the RFS?

When used in internal combustion engines, Brazilian sugarcane ethanol produces similar emissions to petroleum derived fuels. These emissions are subject to the same Clean Air Act requirements as emissions from petroleum-derived fuels, and there is no need for additional air quality regulations to address these emissions. Instead, any emissions associated with the combustion of sugarcane ethanol will be subject to the generally applicable EPA regulations and environmental safeguards that apply to all transportation fuels.

Further, because Brazilian sugarcane ethanol is a foreign product, the harvest and production processes are regulated by the Brazilian government rather than Congress and the EPA. To that end, air quality impacts associated with Brazilian sugarcane production and harvest are currently mitigated through governmental regulations and voluntary best practices. For example, the Green Ethanol Protocol has dramatically reduced reliance on sugarcane burning during harvest and, as a result, has dramatically reduced local air quality impacts in Brazil. As a result of these initiatives in Brazil, Congress can be assured that Brazilian sugarcane ethanol is not producing additional air quality impacts in the United States or in Brazil.

A study led by pathologist doctor Paulo Saldiva, from University of São Paulo⁸, shows that the large-scale replacement of petroleum by sugarcane biofuels provides significant benefits for public health. This study indicated that more than 12,000 hospitalizations and 875 death would be avoided annually by replacing the gasoline and diesel in São Paulo's bus fleet with sugarcane biofuels. The study also found that the reduction of public and private expenditure on health would be about \$190 million. Further, in addition to providing advantages related to the local environment, the production and use of sugarcane ethanol brings important social benefits such as employment generation and income, and public health around the world.

V. Has the implementation of the RFS revealed any environmental challenges or benefits not fully anticipated in the statute?

UNICA is unaware of any unanticipated challenges or benefits that were not fully anticipated by the EISA or by EPA when it issued the RFS2 regulations. In response to the slow development of commercial-scale cellulosic biofuel facilities EPA has conducted rulemakings each year that waive significant portions of the EISA's cellulosic ethanol mandate. However, that volume has been met with other advanced biofuels such as Brazilian sugarcane ethanol that offer comparable GHG emission reduction benefits. As a result, the GHG emission reduction benefits anticipated by the EISA have been achieved, even if through different paths.

⁸ Saldiva, P. *et al.*, O etanol e a saúde. In: Etanol e bioeletricidade: a cana-de-açúcar no futuro da matriz energética / [coordenação e organização Eduardo L. Leão de Souza e Isaias de Carvalho Macedo. -- São Paulo: Luc Projetos de Comunicação, 2010. p. 98-135.

Another recent development that may not have been anticipated by Congress or by EPA is the development of two-way ethanol trade between the United States and Brazil. This trade involves the import of an advanced biofuel—Brazilian sugarcane ethanol—into the United States, and the export of a conventional renewable fuel—corn ethanol⁹—to Brazil. Some have argued that this two-way trade is inefficient and should be stopped, presumably by increasing consumption of advanced biofuels in Brazil and by increasing consumption of corn ethanol in the United States. However, no matter how interesting it may be as an abstract policy matter, it would be inappropriate to attribute any unforeseen environmental challenges associated with two-way ethanol trade to the RFS program. First, the RFS program does contemplate the import of ethanol from Brazil and EPA expressly included emissions associated with the transport of Brazilian sugarcane ethanol when it completed its LCA. As a result, these emissions were fully anticipated by the statute and EPA's implementing regulations. Second, any environmental challenges associated with the export of corn ethanol to Brazil are completely unrelated to implementation of the RFS program and cannot be attributed to it. Instead, such challenges should be attributed to the market conditions that created them, namely excess supply of domestic corn ethanol and policies in Brazil that encourage the export of United States ethanol to Brazil. In sum, none of the unanticipated impacts associated with two-way ethanol trade can be attributed to the implementation of the RFS program.

VI. What is the optimal percentage of ethanol in gasoline? What is the optimal percentage of biomass-based diesel in diesel fuel?

As the largest representative organization of the Brazilian ethanol industry, UNICA's extensive experience with low, medium, and high ethanol content blends is highly relevant to the United States' consideration of higher ethanol blends, including, but not limited to E15. In fact, ethanol blends of up to 25% have been commonly used in Brazil for several years. Based on UNICA's experience, approval of higher ethanol blends under appropriate regulatory and technological circumstances can provide a feasible and cost efficient opportunity to produce real environmental benefits including GHG emissions reductions. At the same time, UNICA appreciates that the successful implementation of high ethanol content blends is the result of a century-long commitment to ethanol and to the development of the infrastructure needed to support it. As a result, there is no guarantee that Brazil's ethanol policy choices represent the optimal policies for the United States. Thus, although UNICA cannot offer a specific recommendation for the optimal percentage of ethanol in gasoline, we believe that the United States can successfully implement higher ethanol content blends and we offer our substantial expertise to Congress and to EPA in the event that they wish to pursue implementation of higher ethanol content blends

As for renewable diesel, UNICA has followed closely the experience of the United States and other companies developing renewable diesel from sugarcane and other feedstocks. For instance, California-based Amyris has been operating a plant in Brazil that converts sugarcane into a renewable diesel. Amyris renewable diesel is a drop-in replacement for petroleum-derived fuels compatible with existing diesel engines and fuel systems without modifications. In fact, following successful testing with engine and bus manufacturers such as Cummins and Mercedes-Benz, approximately 300 buses in the cities of São Paulo and Rio de Janeiro, Brazil,

⁹ Under the EISA, "ethanol derived from corn starch" cannot qualify as an advanced biofuel. 42 U.S.C. §7545(o)(1)(B)(i).

have been running on 10-30% blends of Amyris renewable diesel for over a year already.¹⁰ Based on this experience, we believe that there's clear evidence that renewable diesel, produced from sugarcane, may be able to play a growing role in powering diesel engines in the years to come. UNICA believes, however, the correct approach is to continue close engagement with engine manufactures and standard-setting bodies before launching into a determination of what the "optimal" blend should be.

VII. What are the best options for substantially further reducing greenhouse gas emissions from the transportation sector? Is the RFS an important component of such effort?

UNICA believes that continued support for and development of advanced biofuels and other renewable fuels with significant GHG emissions reduction potential is the best option for reducing GHG emissions from the transportation sector. Thus a continued commitment to the aggressive and technology-forcing renewable fuel mandates included in EISA will be a critical component to any effort to reduce such emissions. The industry needs clear and stable rules in order to continue to attract investments that will bring lower emissions alternatives fuels into the market. UNICA's members have played a critical role in helping the United States achieve these aggressive mandates for advanced biofuels thus far. And UNICA and its members are committed to producing increasing quantities of Brazilian sugarcane ethanol to help ensure compliance with the RFS program's advanced biofuel mandate in the future. Thus we urge Congress and EPA to maintain its commitment to advanced biofuels, and to ensure that other transportation policies are consistent with the goals of the EISA and do not inadvertently serve as impediments to successfully achieving the EISA's advanced biofuels mandate.

Respectfully Submitted,



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¹⁰ Battistella, G. *et al.*, "Amyris's Cane Diesel in Brazil: Sugarcane is not for just ethanol anymore." In Informa Economics FNP *Renergy 2011*, 2011. p. 178-181