RFA RENEWABLE FUELS ASSOCIATION

May 20, 2018

Brazil Ministry of Mines and Energy

Re: "Proposal of Annual Compulsory Emission Reduction Goals in the Sale of Fuels"

To Whom it May Concern:

The Renewable Fuels Association (RFA) appreciates the opportunity to provide these comments in response to the Ministry of Mines and Energy's (MME) public consultation regarding proposed annual carbon intensity reduction targets under the RenovaBio program *("Proposta de Metas Compulsórias Anuais Redução Emissões na Comercialização de Combustíveis", Technical Note 12/2018/DBIO/SPG).*

RFA is the leading trade association for the United States ethanol industry. Its mission is to advance the development, production, and use of fuel ethanol by strengthening the U.S. ethanol industry and raising awareness about the benefits of renewable fuels. Founded in 1981, RFA serves as the premier meeting ground for industry leaders and supporters. RFA's 300-plus members are working to help America become cleaner, safer, more energy secure, and economically vibrant.

In general, we believe the proposed annual carbon intensity (CI) reduction schedule, in which the average CI of gasoline is reduced by 10.1% between 2018-2028, is reasonable and achievable. As acknowledged by MME, meeting the proposed targets will require a significant increase in biofuels consumption. Thus, it is imperative that the CI scoring of biofuel pathways under RenovaBio is conducted in an accurate, transparent, and science-based manner.

Accordingly, our comments focus primarily on the draft CI scores for certain biofuel pathways examined by MME and presented during the public consultation, as well as certain elements of the draft RenovaCalc CI estimation tool.

Overall, we applaud MME and Embrapa for their efforts to develop and refine the RenovaCalc tool. However, we believe the underlying assumptions for certain pathways should be revisited and revised. With certain further refinements (as described in the following sections), we believe the calculator can provide both regulators and regulated entities with reliable estimates of the CI associated with various fuel pathways.

1. Specific Comments

Table 1 shows preliminary CI values for common ethanol pathways presented by MME during the public consultation as part of Technical Note 12/2018/DBIO/SPG. Given that many of our member companies produce ethanol that is exported to Brazil, the pathway for imported corn ethanol is of particular interest to RFA.

Table 1. RenovaCalc Carbon Intensity Values for Ethanol Pathways

Feedstock/Fuel	Origin	Anhydrous	Hydrous
		Grams CO2e/Megajoule	
1G Sugarcane Ethanol	Brazil	20.51	20.79
2G Bagasse Ethanol	Brazil	4.41	4.70
1G/2G Sugarcane/Bagasse Ethanol	Brazil	18.63	18.91
1G Sugarcane/Corn "Flex" Ethanol	Brazil	22.55	22.83
1G Corn Ethanol	Brazil	26.13	26.47
1G Corn Ethanol	Imported	40.35	--

We note that the value for imported 1G corn ethanol (40.35 g/MJ) included in the Technical Note is lower than the default value (43.2 g/MJ) that appears in the RenovaCalc tool (tab E1GMI). The reasons for this discrepancy are not clear and we request clarification from MME on which value is correct.

The sizable difference (14-17 g/MJ) between 1G corn ethanol produced in Brazil and imported 1G corn ethanol in Table 1 is noteworthy and RFA examined RenovaCalc in detail in an attempt to understand this discrepancy.

Table 2 shows the estimated emissions from RenovaCalc for Brazil-origin corn ethanol (anhydrous) and imported corn ethanol broken down by lifecycle phase.

Table 2. Comparison of RenovaCalc Pathways for 1G Brazil-origin and imported corn ethanol

Lifecycle Phase	1G Brazil-origin corn ethanol	1G Imported corn ethanol
	Grams CO2e/Megajoule	
Agricultural	19.1	18.3
Industrial	4.9	19.0
Transport	1.7	5.5
Use	0.4	0.4
Total	**26.1**	**43.2**

As shown in Table 2, the main drivers of the difference between CI values for Brazil-origin corn ethanol and imported corn ethanol are industrial emissions and transport emissions. Thus, while we examined the assumptions behind each phase of the lifecycle for both Brazil-origin and imported corn ethanol, we have focused primarily on understanding the assumptions that directly caused the largest discrepancies.

For imported corn ethanol, the agriculture-related assumptions (e.g., fertilizer and chemical application rates, fuels and electricity, etc.) do appear largely consistent with common practices in U.S. corn production as documented by the U.S. Department of Agriculture and other entities.

However, as described below, we question several key assumptions and accounting methods regarding industrial (processing) stage emissions for both Brazil-origin and imported corn ethanol.

- For imported corn ethanol, it appears that RenovaCalc assumes production facilities only produce ***dried*** distillers grains, when in fact more than 30% of the distillers grains produced by dry mills in the U.S. are not dried at all, and another 10% are not fully dried. This is a critical assumption because a considerable amount of thermal energy is used in drying distillers grains, and this energy consumption is avoided when the distillers grains are marketed in wet form.
- At 300 km, the transportation distance assumed for transporting corn to the ethanol plant is vastly overstated. In the U.S., the average transportation distance for shipping corn from the field to the ethanol plant is less than 40 miles (64 km). Correcting this assumption alone would reduce the CI score of imported corn ethanol by 1.75 g/MJ.
- It appears that RenovaCalc assumes the average facility producing imported corn ethanol uses some coal as an input to generate process heat (i.e., in addition to coal used indirectly through grid electricity). In the U.S., only wet mill ethanol plants (representing 10% of total production capacity) burn coal. Dry mill plants (representing 90% of U.S. production) do not use coal and use only natural gas as the source of process heat.
- RenovaCalc appears to assume that imported ethanol is shipped a significant distance by road. For ethanol imported from the U.S., rail and barge/ship transportation account for all of the transportation miles from the U.S. to Brazil. Typically, U.S. ethanol that is exported to Brazil is loaded directly onto railcars at the ethanol production facility and shipped via rail to an export terminal where it is transloaded onto tanker ships. Once the ethanol arrives in Brazil, it seems highly unlikely that it would be transported by truck an average distance of 600 km, as assumed in RenovaCalc. It seems much more likely, that much of the imported corn ethanol would be blended and consumed in the major population centers near the ports.
- For Brazil-origin corn ethanol, it is assumed that process heat/thermal energy and electricity use by the ethanol plant comes exclusively from burning wood chips. It is also assumed that Brazilian corn ethanol plants will produce excess electricity as a co-product, resulting in a meaningful CI credit. Given that the corn ethanol facilities existing or under construction in Brazil generally use the same process technology and design as plants in the U.S., we question the assumptions that these facilities will get all of their energy from wood chips and will generate excess electricity.

2. Recommendations

Following our review of the draft RenovaCalc and the proposed CI values presented in Technical Note 12/2018/DBIO/SPG, we offer the following recommendations.

- **We support the RenovaCalc's use of the mass-based allocation method for determining co-product credits.**
- **We support MME's decision to exclude hypothetical and highly speculative indirect land use change (ILUC) emissions from RenvocaCalc.** The best available science today has dismissed

early alarmist predictions of significant land use change emissions attributable to biofuels expansion, and real-world data evaluated in the wake of significantly increased corn ethanol production in the United States has found no meaningful ILUC emissions.

- **For imported corn ethanol, we recommend revisiting assumptions about the co-products associated with corn ethanol production**. Specifically, RenovaCalc should account for the fact that roughly 30% of U.S. distillers grains output is not dried at all, and at least 10% is not fully dried, resulting in less natural gas energy consumption than assumed.
- **Transportation distance and transportation mode default assumptions should be revised for the imported corn ethanol pathway**. As described above, the distance corn is transported to the ethanol plant is no more than 40 miles on average (64 km). Further, U.S. corn ethanol destined for export to Brazil generally travels by rail to export terminals, not by truck.
- **Separate pathways should be developed for imported corn ethanol from dry mills and imported corn ethanol from wet mills**. As stated above, U.S. dry mills (which account for 90% of the nation's production) do not use coal and thus have lower process emissions than U.S. wet mills. We believe the RenovaCalc should have separate pathways for both wet mills and dry mills and emissions from coal consumption should be charged only to wet mills, rather than driving up average process-related emissions for all imported corn ethanol.
- **We encourage developers of RenovaCalc to reconsider the process (industrial) energy source for Brazilian corn ethanol facilities.** To our knowledge, the Brazilian corn ethanol facilities were designed similarly to U.S. corn ethanol facilities and are likely to use some fossil energy (natural gas, grid electricity) for process heat/thermal energy generation.
- **As Brazilian regulators consider the next steps in implementing CI estimation and verification tools under RenovaBio, we strongly encourage you to allow biofuel producers to provide user-specified input data for energy use, transportation distances, and other key factors.** No two ethanol facilities are the same, and thus we encourage regulators to allow individual producers to submit unique pathway values that best represent their technologies, practices, and geographical situation.

Thank you again for the opportunity to submit these comments on the draft CI reduction schedule under RenovaBio and the draft version of RenovaCalc. We look forward to continued interaction with MME, ANP, and other entities involved in the development of the RenovaBio program.

Sincerely,

Bob Dinneen
President and CEO