

**Method 2B Pathway Summary:
LAICA, Costa Rica — Dehydration of Hydrous Sugarcane Ethanol
from Brazil**

August 27, 2012

Plant Summary

Liga Agricola Industrial De La Cana de Azucar (LAICA) operates an ethanol dehydration plant in Punta Morales, a town in the Puntarenas province of Costa Rica. Much of Costa Rica's west coast lies within Puntarenas. LAICA dehydrates imported Brazilian hydrous sugarcane ethanol (95 percent ethanol) at its Punta Morales plant. Dehydration is accomplished using molecular sieves. The finished product (99.5 percent ethanol) is shipped by oceangoing tanker to California. Oceangoing tankers transport hydrous ethanol from Brazil to the LAICA plant, and anhydrous product from that plant to California. LAICA uses bunker fuel as the energy source for the plant's boiler. Steam from the boiler serves as the heat source for the molecular sieves and is also used to co-generate electricity. The dehydration stage CI calculated in this analysis is added to the existing Low Carbon Fuel Standard LCFS CIs for the three Brazilian sugarcane ethanol pathways (average baseline production; electricity export; mechanized harvesting and electricity export).

Carbon Intensity of Ethanol Produced

The total carbon intensity of the ethanol produced by LAICA consists of the carbon intensity associated with the Brazilian sugarcane ethanol that is dehydrated in the LAICA plant, plus the carbon intensity of the dehydration process itself. The LAICA carbon intensity increment also includes a small transportation component reflecting the shipping distance differential between the existing Brazilian pathways and the proposed CBI pathway. The LCFS lookup table currently contains three Brazilian sugarcane ethanol pathways. The proposed LAICA pathway adds 11.31 gCO₂e/MJ to these pathways, resulting in the final carbon intensities shown in Table 1.

Table 1. LAICA CIs as Increments to Brazilian Sugarcane CIs (gCO₂e/MJ)

Brazilian Pathway Description	Direct Brazilian CI	Brazilian Land Use Change CI	Total Brazilian CI	LAICA Increment ^a	Total LAICA CI
2B Application (Specific conditions apply): Brazilian sugarcane using average production process, dehydrated under CBI in Costa Rica	27.4	46	73.4	11.31	84.71
2B Application (Specific conditions apply): Brazilian sugarcane using average production process, with mechanized harvesting and electricity co-product credit, dehydrated under the CBI in Costa Rica	12.4	46	58.4	11.31	69.71
2B Application (Specific condition apply): Brazilian sugarcane using average production process, with electricity co-product credit, dehydrated under the CBI in Costa Rica	20.4	46	66.4	11.31	77.71

^aAlthough the LAICA application calculated an incremental CI only, LAICA's look up table CIs will consist of the Brazilian sugarcane CIs plus the LAICA incremental CI.

The CIs shown in Table 1 shall be reportable under the California Low Carbon Fuel Standard only when the facility uses electricity and bunker fuel for its process energy, or a fuel with a CI equal to or less than bunker fuel.

The LAICA application was submitted under the Method 2B process. It is not, therefore, subject to the substantiality requirements with which Method 2A applications must comply (a minimum improvement of five gCO₂e/MJ, and a minimum production volume of 10 million gallons per year).

Staff Analysis and Recommendation

ARB staff has reviewed the LAICA application and has replicated, using the CA-GREET spreadsheet, the carbon intensity value calculated by the applicant. LAICA provided documentation for the plant's energy usage and anhydrous ethanol production. Staff is satisfied that the energy consumption values in the application accurately represent LAICA's actual energy usage. Staff believes that LAICA will be able to maintain the energy consumption values reported in its application. Consequently, staff believes that the incremental carbon intensity value of 11.31 gCO₂e/MJ requested by LAICA and shown in Table 1 above accurately represents that plant's carbon intensity. Staff recommends, therefore, that LAICA's application for a Method 2B hydrous-to-anhydrous ethanol pathway be approved.