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Jamaica Broilers Ethanol Ltd. Sugarcane Ethanol Dehydration

Jamaica Broilers Ethanol Plant Summary

Jamaica Broilers Ethanol Ltd. (JBE) operates an ethanol dehydration plant in Port Esquivel, Jamaica. Using Number 6 fuel oil and small quantities of electrical energy from the local utility, the plant dehydrates Brazilian hydrous ethanol to 99.5 percent purity. Hydrous sugarcane ethanol consisting of 95 percent ethanol is transported to the JBE facility via oceangoing tanker. Ethanol from arriving tankers is pumped into JBE's storage tanks. Because hydrous ethanol is an azeotropic mixture, the water cannot be removed through simple distillation. JBE uses molecular sieves to dehydrate the ethanol. Anhydrous ethanol is pumped into on-site storage tanks, and then onto oceangoing tankers for export. Most of the anhydrous ethanol produced is shipped to the United States.

JBE exports anhydrous sugarcane ethanol to the U. S. under the Caribbean Basin Initiative (CBI), an economic incentive program in which Caribbean Basin countries are permitted to export ethanol to the U.S. duty-free. CBI countries are collectively allowed to export a volume of ethanol equal to seven percent of the American consumption for the prior year. Ethanol imported directly to the U. S. from Brazil is subject to import duties.

Carbon Intensity of the Dehydrated Ethanol Produced

The Low Carbon Fuel Standard (LCFS) Lookup Table currently contains no pathway for the ethanol dehydration process. Therefore, the JBE pathway falls under the Method 2B provisions of the LCFS. Because JBE's application was submitted under the Method 2B process, it is not subject to the substantiality requirements with which Method 2A applications must comply (a minimum improvement of 5 gCO2e/MJ, and a minimum production volume of ten million gallons per year).

The total carbon intensity (CI) of the anhydrous ethanol produced by JBE consists of the CI associated with the Brazilian sugarcane ethanol that is dehydrated in the plant, plus the CI of the dehydration process itself. The JBE 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 JBE pathway adds 5.86 gCO2e/MJ to these pathways, resulting in the final carbon intensities shown in Table 1.

The operations at the plant will be subject to the following conditions designed to ensure that the carbon intensity values shown in Table 1 will be met during real time operations:

1) JBE's total energy and electricity use values will become operating conditions upon approval by the Executive Officer of the proposed carbon intensity values. Energy and electricity use shall not exceed the current values that are classified by the applicant as confidential business information.
2) The CIs shown in Table 1 shall be reportable under the California Low Carbon Fuel Standard only when plant process thermal energy is generated with Number 6 Fuel Oil.
3) If JBE uses either of its two lowest carbon intensity values, the Brazilian suppliers of hydrous ethanol must be registered with the ARB and must demonstrate that their plants qualify for the lower carbon intensity values claimed.

Table 1: Proposed Lookup Table Entries

Fuel/Feedstock	Proposed Lookup Table Pathway Description	Carbon Intensity in gCO_2e/MJ (Including Indirect Effects)	Do Special Conditions Apply? (Y/N)[1]
Anhydrous Ethanol/Hydrous Ethanol	Brazilian sugarcane ethanol dehydrated in Jamaica; Brazilian ethanol production includes mechanized harvesting, and export of electricity to the grid	64.26	Y
Anhydrous Ethanol/Hydrous Ethanol	Brazilian sugarcane ethanol dehydrated in Jamaica; Brazilian ethanol production includes export of electricity to the grid	72.26	Y
Anhydrous Ethanol/Hydrous Ethanol	Brazilian sugarcane ethanol dehydrated in Jamaica; standard Brazilian ethanol production process.	79.26	Y

[1] The special conditions to which this column refers are discussed in the "Carbon Intensity of the Fuel Produced" section of this summary

Staff Analysis and Recommendation

ARB staff has reviewed the JB Ethanol application and has replicated, using the CA-GREET spreadsheet, the carbon intensity value calculated by the applicant. JBE 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 JBE's actual energy usage. Staff believes that the carbon intensity value reported by JBE will be sustainable. Consequently, staff believes that the incremental carbon intensity value of 5.86 gCO_2e/MJ requested by JBE accurately represents that plant's carbon intensity. Staff recommends, therefore, that JBE's application for a Method 2B hydrous-to-anhydrous ethanol pathway be approved.