

Vitol Inc. – Gasohol De El Salvador Sugarcane Ethanol Dehydration

Gasohol El Salvador Plant Summary

The Gasohol De El Salvador Ethanol plant dehydrates hydrous Brazilian sugarcane ethanol and ships the anhydrous ethanol to the U.S. The plant with the production capacity of 90 million gallons/year, located in Acajutla, El Salvador, 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.

Gasohol De El Salvador is under a long term contract with Vitol, a Houston-based energy trading company that provides ethanol to buyers in North America. Hydrous sugarcane ethanol (consisting of 95 percent ethanol) is transported to the Gasohol facility via oceangoing tanker. Ethanol from arriving tankers is pumped into Gasohol's storage tanks. Because hydrous ethanol is an azeotropic mixture, the water cannot be removed through simple distillation. Gasohol uses molecular sieves to dehydrate the ethanol. The plant's industrial boilers are powered by number six fuel oil. Anhydrous ethanol is pumped into on-site storage tanks, and then onto oceangoing tankers for the trip to California.

Carbon Intensity of the Dehydrated Ethanol Produced

The total carbon intensity (CI) of the anhydrous ethanol produced by Gasohol consists of the CI associated with the Brazilian sugarcane ethanol that is dehydrated in the plant, plus the CIs of the dehydration and transportation process. The transportation component of the CI reflects 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 Gasohol pathway adds 5.71 gCO₂e/MJ to these pathways, resulting in the final carbon intensities shown in Table 1.

Table 1: Proposed Lookup Table Entries

Fuel/Feedstock	Proposed Lookup Table Pathway Description	Carbon Intensity in gCO ₂ e/MJ (Including Indirect Effects)	Do Special Conditions Apply? (Y/N) ¹
Anhydrous Ethanol/Hydrous Ethanol	Brazilian sugarcane ethanol dehydrated in El Salvador; standard Brazilian ethanol production process	79.11	N
Anhydrous Ethanol/Hydrous Ethanol	Brazilian sugarcane ethanol dehydrated in El Salvador; Brazilian ethanol production includes mechanized harvesting, and export of electricity to the grid	64.11	N
Anhydrous Ethanol/Hydrous Ethanol	Brazilian sugarcane ethanol dehydrated in El Salvador; Brazilian ethanol production includes export of electricity to the grid	72.11	Y

The operations at the plant will be subject to conditions designed to ensure that the carbon intensity values in table 1 will be met during real time operations.

- 1) Gasohol'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 six fuel oil.
- 3) If either of the two lowest carbon intensity values are used, the Brazilian producers must be registered with ARB and must demonstrate that their plants qualify for the lower carbon intensity values claimed.

The Gasohol 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 ten million gallons per year).

Staff Analysis and Recommendation

ARB staff has reviewed the Vitol–Gasohol De El Salvador application and has replicated, using the CA-GREET spreadsheet, the carbon intensity value calculated by the applicant. Gasohol 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 Gasohol’s actual energy usage. Staff believes that the carbon intensity value reported by Gasohol will be sustainable. Consequently, staff believes that the incremental carbon intensity value of 5.71 gCO₂e/MJ requested by Gasohol accurately represents that plant’s carbon intensity. Staff recommends, therefore, that Gasohol’s application for a Method 2B hydrous-to-anhydrous ethanol pathway be approved.