

**Staff Summary
Method 2B Application
Ethanol from Sugarcane and Sweet Sorghum
California Ethanol & Power, Manhattan Beach, California
(Pathway Codes: ETHS026 and ETHG022)**

Deemed Complete Date: December 5, 2015
Posted for Public Comment Date: December 22, 2015
Certified Date: January 4, 2016

Pathway Summary

California Ethanol & Power (CE&P) is developing a sugarcane and sweet sorghum to ethanol plant in the Imperial Valley in California, CA. CE&P produces ethanol from the fermentation of sugarcane and sweet sorghum juice. Fermentation residue or vinasse is used to produce biomethane for fueling CNG vehicles. The facility burns bagasse along with trash to produce steam and power for the ethanol plant. Excess electric power is exported to the grid.

The facility will have an ethanol production capacity of 44 million gallons of ethanol from sugarcane and 22 million gallons from sweet sorghum. The facility will also produce 923 million standard cubic feet per year of biomethane and export 244 GWh of electric power.

The applicant requests prospective carbon intensities (CIs) of 54.47 and 39.00 g CO₂e/MJ for sugarcane and sweet sorghum ethanol respectively. The CI values for these pathways are based on lifecycle analysis conducted using the CA-GREET 1.8b model.

Carbon Intensity of Ethanol

Ethanol and biomethane are produced from the fermentation of sugarcane and sweet sorghum with co-production of electricity. The ethanol pathways utilize the CA-GREET1.8b calculation approach for Brazilian sugarcane ethanol. The GTAP analysis from the LCFS regulation provides the basis for the indirect LUC effects. The modeling parameters for the two feedstocks (i.e., sugarcane and sweet sorghum) are modeled as representative of sugarcane grown in Brazil and corn grown in the United States.

Agricultural inputs are based on the default values in the CA-GREET 2.0 model. The data for the ethanol plant is based on CE&P's design. All of the calculations for the fuel pathway are performed in the CA-GREET1.8b model. Agricultural inputs and co-product electricity are distributed by energy allocation to the ethanol and biomethane fuel products since both ethanol and biomethane are used as transportation fuels.

As shown in table below, the applicant has calculated the prospective CIs of its sugarcane and sweet sorghum ethanol pathways to be 54.47 and 39.00 g CO₂e/MJ, respectively.

Proposed Lookup Table Entries

Fuel	Pathway Identifier	Pathway Description*	Carbon Intensity Values (g CO ₂ e./MJ)		
			Direct CI	Indirect LUC	Total
Ethanol	ETHS026	2B Application: Sugarcane to Ethanol	8.47	46.00	54.47
Ethanol	ETHG022	2B Application: Sweet Sorghum to ethanol	9.00	30.00	39.00

* Conditions Apply

Operating Conditions

Because the proposed ethanol project has not commenced commercial operation yet, staff cannot determine actual inputs for the commercial production of ethanol. Staff therefore, imposes constraints on production of ethanol for these prospective pathways, which are listed below. The applicant shall not use these prospective CIs for purposes of claiming credits unless evidence of actual production along with supporting data is provided and updated provisional CIs are certified for these pathways (which will entail one quarter of commercial production data).

- Data supporting the CI of biomethane including methane leaks, gas processing, and compression of the renewable biomethane shall be submitted to ARB.
- The company shall provide quarterly receipts for two years to support quantity of ethanol, biomethane, and electric power produced from the CE&P facility. CE&P shall also provide data on agricultural inputs (fertilizers and pesticides), sugarcane and sweet sorghum yield per acre, fuel use per acre and additional information requested by ARB.
- The company shall demonstrate that the harvest of residues (trash) from the agricultural fields would not adversely impact the soil C and nutrient loss and shall take appropriate conservation actions to avoid adverse environmental impacts.

Staff Analysis and Recommendation

ARB staff has reviewed the application and has replicated the carbon intensity values calculated for the two pathways using the CA-GREET 1.8b model. CE&P provided documentation for the facility’s energy inputs based on process modeling. Based on a preliminary assessment using submitted process information, staff has estimated carbon intensity values for the two ethanol pathways as proposed by the applicant. Staff believes that the prospective CI

values indicated here are a reasonable representation of the carbon intensities of sugarcane and sorghum ethanol. Since the applicant provided only process modelling data, staff recommends that the Method 2B application be approved as prospective.

Fuels with prospective CIs are not eligible to claim credits under the LCFS. To claim credits, the applicant must provide one quarter of operational data once commercial production has commenced. ARB will then complete an updated lifecycle analysis and make necessary adjustments to the originally certified prospective CIs if warranted and approve a provisional CI for each of the pathways being considered in this application. To confirm compliance with updated operating conditions, the Executive Officer may reevaluate any aspect of the review at any time and revise the certification to reflect new information. At any time after certification, the Executive Officer may increase the CI values upon determination that the provisional CIs underestimate fuel life carbon intensity. (Cal. Code Regs. tit. 17, § 95486, subd. (e)(3)(K) (original LCFS); Cal. Code Regs. tit. 17, § 95488, subd. (c)(5)(L) (from January 1, 2016).)