

Method 2A Fuel Pathway Summary: Flint Hills Resources (FHR), Fairmont, Nebraska

Plant Summary

Flint Hills Resources¹ produces corn ethanol at a dry mill plant located in Fairmont, Nebraska. According to the air permit issued by the Nebraska Department of Environmental Quality, the plant's maximum production capacity is 126 million gallons of ethanol annually. About 70 million gallons of the ethanol from this plant is shipped to California. The plant is a dry mill, ICM-designed, natural gas-fired plant producing distillers grains with solubles (DGS). DGS is a corn ethanol co-product which primarily replaces corn in livestock feed rations. Of the DGS produced at the Fairmont plant, 91 percent is a fully dried product referred to as dry DGS (DDGS) and the remainder is modified DGS (MDGS)—a partially dried product. DDGS has a moisture content of about 10 percent while MDGS contains about 50 percent moisture. The Fairmont plant also produces corn oil as a co-product. All three co-products (DDGS, MDGS, and corn oil) are sold as livestock feed, though some corn oil is occasionally sold to biodiesel producers. FHR has not included a corn oil co-product credit in its carbon intensity calculations. Because no corn oil credit is claimed, and because much of the extracted corn oil remains in the livestock feed market, FHR's carbon intensity includes the default DGS co-products credit.

Carbon Intensity of the Fuel Produced

The single CI for which Fairmont is applying reflects the energy consumed for the production of ethanol and the three co-products described above. It is valid when 91 percent or less of the DGS produced is fully dried. Excluding land-use-change emissions, the carbon intensity of the Fairmont plant, as calculated by FHR, is 58.84 gCO_{2e}/MJ of ethanol produced. When 30 gCO_{2e}/MJ of land use change emissions are included, the total carbon intensity of the Fairmont plant becomes 88.84 gCO_{2e}/MJ. The reference carbon intensity from the LCFS Lookup Table is 98.40 gCO_{2e}/MJ for Midwestern gas-fired plants producing DDGS. Because the proposed carbon intensity is five or more gCO_{2e}/MJ below the reference pathway carbon intensity, the proposed pathway meets the LCFS substantiality requirement. Table 1 shows the carbon intensity value for the Fairmont Plant.

¹ On December 7, 2012, Flint Hills Resources acquired the Fairmont plant from Advanced BioEnergy.

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
Ethanol/Corn	Midwest, Dry-Mill, dry DGS, Natural Gas	88.84	Y

¹The special conditions to which this column refers are discussed in the “Carbon Intensity of the Fuel Produced” section of this summary.

The Fairmont plant achieves a lower carbon intensity value relative to the reference pathway through its modern design which reduces energy use. Thermal energy consumption at the Fairmont plant is below the 36,000 BTU per gallon energy use value that forms the basis of the carbon intensity of the reference DDGS pathway. Electricity use at the Fairmont plant is also below the 1.08 kW-hr per gallon that is assumed for the reference pathway². The thermal energy and electricity use values appearing in the FHR application will become operating conditions upon approval of that application by the Executive Officer³. These conditions effectively limit Fairmont to the production of no more than 91 percent DDGS for the ethanol sold into the California market: fully drying a higher proportion of its DGS co-product will increase energy consumption and carbon intensity beyond the values specified in the company’s Method 2A application. Until the Executive Officer acts on the FHR application, the plant’s thermal energy use and electricity use values shall not exceed the values reported in the application. These values are classified by the applicant as confidential business information.

Staff Analysis and Recommendation

ARB staff has reviewed the FHR Fairmont plant’s application and has replicated, using the CA-GREET model, the carbon intensity value calculated by the applicant. FHR provided documentation for the plant’s energy usage and ethanol production. Staff is satisfied that the energy consumption values in the application accurately represent the Fairmont plant’s actual energy usage. Staff believes that the carbon intensity value reported by FHR can be sustained. Consequently, staff believes that the carbon intensity value of 88.84 gCO₂e/MJ for corn ethanol proposed by FHR accurately represents that plant’s carbon intensity. Staff recommends, therefore, that the Fairmont Plant’s application for a Method 2A Ethanol pathway be approved.

²Actual plant energy use values are classified as confidential business information and not reported herein.

³The energy and electricity use values appearing in the FHR Fairmont application will become operating conditions upon approval of that application by the Executive Officer unless the Executive Officer modifies those values—in which case the revised values will become operating conditions.