

**Staff Summary
Method 2B Application
FutureFuel Chemical Company
Used Cooking Oil and Corn Oil to Biodiesel Pathway
(BIOD027, BIOD028)**

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Pathway Summary

FutureFuel Chemical Company has the capacity to produce up to approximately 59 million gallons of mixed feedstock biodiesel (BD) annually at its Batesville, Arkansas plant. FutureFuel has applied for Method 2B pathways covering the used cooking oil and corn oil biodiesel produced at the Batesville plant. Both pathways are modified versions of existing Low Carbon Fuel Standard (LCFS) biodiesel pathways.¹

The biodiesel plant is co-located with a chemical production facility which produces specialty chemical intermediates. The two facilities share common plant services including steam, grid electricity, cooling water, process water, wastewater treatment, waste disposal, air, and nitrogen systems.

Five boilers supply steam to all FutureFuel chemical and biodiesel process units: two natural gas boilers provide approximately 59 percent of the steam capacity while three coal/liquid (C/L) boilers supply the remaining 41 percent. The C/L boilers combust coal and hazardous liquid waste from the chemical and biodiesel process units. The alternative fate of these wastes would be destruction by incineration, as required under the Resource Conservation and Recovery Act.² FutureFuel has provided compliance performance test results demonstrating that the hazardous waste destruction efficiency of its C/L boilers is 99.9991 percent. This destruction efficiency is sufficient to meet the maximum achievable control technology standards set forth in U.S. EPA 40 CFR 63 Subpart EEE. Because the destruction efficiency of the C/L boilers is comparable to the destruction efficiency achieved through incineration, the use of these hazardous wastes in the boilers produces no net change in emissions. As such, no greenhouse gas emissions associated with the combustion of these wastes in the C/L boilers is included in carbon intensity (CI) of FutureFuel's biodiesel pathway. That CI accounts only for the use of coal and natural gas as process fuels.

¹ California Air Resources Board, June 30, 2011. Detailed California-Modified GREET Pathway for Biodiesel Produced in the Midwest from Used Cooking Oil and Used in California. Version 2. <http://www.arb.ca.gov/fuels/lcfs/2a2b/internal/15day-mw-uco-bd-rpt-022112.pdf>. California Air Resources Board, November 3, 2011. California-Modified GREET Pathway for the Production of Biodiesel from Corn Oil at Dry Mill Ethanol Plants. Version 2. <http://www.arb.ca.gov/fuels/lcfs/2a2b/internal/15day-cornoil-bd-rpt-022112.pdf>.

² 42 U.S.C. §6901 et seq. (1976). The Resource Conservation and Recovery Act implementing regulations are found at 40 CFR Part 260.

FutureFuel based its pathways on existing LCFS used cooking oil and corn oil biodiesel pathways.³ It left most of the default inputs from these pathways unchanged in its CI calculations. Only the BD production energy consumption combustion emissions per mega joule of fuel energy, electrical generation energy mix, and transportation distance inputs were changed.

Carbon Intensity of the Fuel Produced

The LCFS lookup table currently contains no pathways for BD produced in Arkansas, or produced using hazardous waste as process fuel. Therefore, the FutureFuel pathway falls under the Method 2B provisions of the LCFS regulation. Because FutureFuel’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 five gCO₂e/MJ, and a minimum production volume of ten million gallons per year).

The proposed FutureFuel pathway CIs are shown in the following table.

Proposed Lookup Table Entry

Fuel	Pathway Identifier	Pathway Description	Carbon Intensity in gCO ₂ e/MJ		
			Direct Emissions	Land Use or other Indirect Effects	Total
Biodiesel	BIOD027	2B Application*: North American UCO; Biodiesel Produced in Arkansas	23.81	0	23.81
Biodiesel	BIOD028	2B Application*: North American Corn Oil (extracted from distillers grains prior to the drying process); Biodiesel Produced in Arkansas	9.65	0	9.65

*Specific Conditions Apply

³ California Air Resources Board, June 30, 2011 and November 3, 2011, op. cit.

Operating Conditions

Operations at the plant will be subject to the following condition designed to ensure that the CI of the BD produced at the FutureFuel plant will remain at or below the value appearing in the above table for all volumes of BD sold in California:

- 1) Except for periods of abnormal operations, such as planned maintenance or unpredictable, unavoidable, and uncontrollable *force majeure* events, the total thermal and electrical energy use values per gallon biodiesel produced as specified in the FutureFuel application shall not be exceeded.
- 2) All gallons produced under all certified LCFS Method 2 pathways shall inherit the same CI increment from the consumption of process energy at the plant. The applicants may not allocate process energy CIs so as to reduce the total life cycle CI of some subset of the gallons produced (e.g., those being shipped to California) and increase the CI of the remaining gallons. An example of such a reallocation would be associating California-bound gallons with the consumption of natural gas and non-California-bound gallons with the consumption of coal.
- 3) The hazardous waste destruction efficiency of FutureFuel's C/L boilers shall remain at or above the 99.99 percent level achieved in its boiler performance tests. In addition, the C/L boilers shall continue to meet the maximum achievable control technology standards set forth in U.S. EPA 40 CFR 63 Subpart EEE. No BD gallons produced using steam from boilers that failed to achieve 99.99 percent destruction efficiency, or that failed to meet maximum achievable control technology standards set forth in U.S. EPA 40 CFR 63 Subpart EEE shall be sold in California under the used cooking oil or corn oil biodiesel pathways described in this Staff Summary.

Staff Analysis and Recommendation

Staff has reviewed FutureFuel's Method 2B application, and finds the following:

- Staff has replicated, using the CA-GREET spreadsheet, the carbon intensity values calculated by the applicant; and
- Staff has concluded that the plant's actual energy consumption is not likely to exceed the energy consumption levels specified in FutureFuel's Method 2B application.

The operational information provided by the applicant indicates that the FutureFuel plant is capable of reliably producing used cooking oil and corn oil BD at or below the CIs appearing in the above table. Therefore, staff recommends that FutureFuel's Method 2B application for used cooking oil and corn oil biodiesel be approved, subject to the operating conditions set forth in this Staff summary.