

**DRAFT Staff Summary:  
Mixed Feedstock for Renewable Diesel  
Method 2B Pathway  
Diamond Green Diesel**

**Plant Summary**

Diamond Green Diesel (DGD) has submitted a Method 2B application for the production of mixed-feedstock renewable diesel (RD) at its St. Charles, Louisiana plant. The St. Charles plant, which is currently under construction, will be capable of producing 420,000 gallons of RD per day. DGD expects the plant to begin producing RD from the following seven feedstocks in early 2013: Midwestern soy oil, Midwestern corn oil, Midwestern used cooking oil (cooking required), Midwestern used cooking oil (no cooking), U.S. animal fat (higher energy), and U.S. animal fat (lower energy). All seven of DGD’s pathways are modified versions of existing LCFS RD or biodiesel pathways. All are modeled as UOP Econofining Processes and utilize the default RD process energy consumption values found in CA-GREET 1.8b. Those process energy defaults are summarized in Table 1 below. All individual feedstocks present in the feedstock mixtures to be run at the St. Charles plant will be tracked by an inventory management system that is integrated into the plant’s accounting system. The carbon intensity of all gallons of RD produced will be labeled with the CI of individual feedstocks, in keeping with the mixed-feedstock bio-and renewable diesel guidance published by ARB<sup>1</sup>.

**Table 1: Energy for Renewable Diesel Process from CA-GREET model**

Feedstock	Process Energy Input (Btu/lb)	Electricity and Thermal Energy Shares (%Electric/%Thermal)
Soy Oil	1,851	61.4% / 38.6%
Corn Oil		
Used Cooking Oil (UCO)	2,175	
Tallow		

**Operating Conditions**

Method 2 applications covering operating plants must base CI calculations on operational data covering two years, whenever possible. Because the DGD application covers a plant that is not yet operational, DGD will submit energy consumption data for the first two years of operation. Data submission will occur no less frequently than annually. If the data submitted indicates that any of DGD’s actual production CIs are significantly higher than its approved LCFS pathway CIs, those CIs will be adjusted to better reflect actual operating conditions.

<sup>1</sup> Air Resources Board, December 3, 2012. “Mixed-Feedstock Bio- and Renewable Diesel Guidance.” <http://www.arb.ca.gov/fuels/lcfs/2a2b/2a-2b-apps.htm>.

As a condition of approval, DGD agrees to make all approved pathway CIs available via the LCFS Method 1 Lookup Tables to other RD producers whose production pathways are accurately described by the approved pathways developed in the DGD application.

### **Carbon Intensity of the Fuel Produced**

Because all of DGD's pathway CIs are either higher than the corresponding reference pathways in the LCFS Method 1 Lookup table, or modified versions of LCFS renewable diesel pathways, its application falls under the Method 2B provisions of the LCFS. Method 2B applications are not subject to the substantiality requirements with which Method 2A applications must comply (a minimum improvement of five gCO<sub>2</sub>e/MJ, and a minimum production volume of ten million gallons per year).

The proposed DGD pathway CIs are summarized in Table 2.

**Table 2: Proposed Lookup Table Entry**

Fuel	Pathway Identifier	Pathway Description	Carbon Intensity in gCO <sub>2</sub> e/MJ (Including Indirect Effects)		
			Direct Emission	Land Use or Other Indirect Effect	Total
Renewable Diesel	RNWD 010	Conversion of Midwest soybean to renewable diesel (rail transport)	21.70	62	83.70
	RNWD 011	Conversion of Midwest soybean to soy oil to renewable diesel (ship transport)	21.48	62	83.48
	RNWD 012	Renewable diesel from Midwest corn oil produced from Dry DGS (rail transport)	6.00	0	6.00
	RNWD 013	Renewable diesel from Midwest corn oil produced from Dry DGS (ship transport)	5.56	0	5.56
	RNWD 016	Conversion of waste oils (Used Cooking Oil) from Midwest to renewable diesel where "cooking" is required (rail transport)	18.40	0	18.40
	RNWD 017	Conversion of waste oils (Used Cooking Oil) from Midwest to renewable diesel where "cooking" is required (ship transport)	18.18	0	18.18
	RNWD 018	Conversion of waste oils (Used Cooking Oil) from Midwest to renewable diesel where "cooking" is not required (rail transport)	13.85	0	13.85

Fuel	Pathway Identifier	Pathway Description	Carbon Intensity in gCO <sub>2</sub> e/MJ (Including Indirect Effects)		
	RNWD 019	Conversion of waste oils (Used Cooking Oil) from Midwest to renewable diesel where “cooking” is not required (ship transport)	13.63	0	13.63
	RNWD 020	Conversion of U.S. tallow to renewable diesel using higher energy use for rendering (rail transport)	40.34	0	40.34
	RNWD 021	Conversion of U.S. tallow to renewable diesel using higher energy use for rendering (ship transport)	40.12	0	40.12
	RNWD 022	Conversion of U.S. tallow to renewable diesel using lower energy use for rendering (rail transport)	19.91	0	19.91
	RNWD 023	Conversion of U.S. tallow to renewable diesel using lower energy use for rendering (ship transport)	19.70	0	19.70

### **Staff Analysis and Recommendation**

Staff has reviewed DGD’s application, and finds the following:

- Staff has replicated, using the CA-GREET spreadsheet, the carbon intensity values calculated by DGD; and
- Staff has confirmed that the energy consumption values used in the DGD application are the CA-GREET 1.8b defaults

On the basis of these findings, staff recommends that DGD’s Method 2B pathways be approved for use in DGD’s mixed-feedstock RD plant.