

**Staff Summary
Method 2B Application
Eco Solutions Co. Ltd
Used Cooking Oil to Biodiesel Pathway
(BIOD041)**

Deemed Complete Date: December 10, 2015
Posted for Comment Date: December 17, 2015
Certified Date: January 28, 2016

Pathway Summary

Eco Solutions Co. Ltd is a biodiesel plant in South Korea produces biodiesel (BD) from used cooking oil (UCO) located at Jeongeup, Korea. The plant produces approximately 23.5 million gallons of BD annually.

The plant employs the traditional fatty acid methyl ester (FAME) transesterification process and utilizes a co-solvent for the feedstock conversion. The produced crude biodiesel is tested to meet ASTM Method D6751. The co-product crude glycerin is stored on-site prior to off-site shipment to potential buyers.

Eco Solutions uses all of the default input parameters in its CA-GREET analysis. Only the electrical generation energy mix of South Korea and the transportation distance parameters (ocean tanker and truck transport to CA) were changed. Therefore, this pathway is considered Method 1 pathway for Biodiesel originated from Korean as long as the parties using this pathway be able to demonstrate the plant energy consumption and the BD yield are at or below the default values used in the ARB document and the CI is not exceeded the certified CI shown in Table 1.

Carbon Intensity of the Fuel Produced

The LCFS lookup table currently contains no pathway covering BD produced in Korea. Therefore, the Eco Solutions pathway falls under the Method 2B provisions of the LCFS. Because Eco Solutions' 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 Eco Solutions pathway CIs are shown in the following table.

| Fuel | Pathway Identifier | Pathway Description | Carbon Intensity in gCO ₂ e/MJ | | |
|-----------|--------------------|--|---|------------------------------------|---------------------------|
| | | | Direct Emissions | Land Use or other Indirect Effects | Total |
| Biodiesel | BIOD041 | 2B Application*: South Korean UCO where “cooking” is required; Biodiesel Produced in Korea | 22.11 20.37 | 0 | 22.11 20.37 |

*Specific Conditions Apply

Operating Conditions

Operations at the plant will be subject to the following conditions designed to ensure that the CI of the of the BD produced at the Eco Solutions 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 specified in the Eco Solutions 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 biogas and non-California-bound gallons with the consumption of natural gas.
- 3) The CI in the table above is applied to feedstock UCO mainly sourced from South Korea. If UCO is obtained from other regions and countries of the world, the carbon intensities above are not valid to report for LCFS credit earning.
- 4) If UCO is commingled with other feedstock (animal fat, plant oil, etc.) to produce biodiesel, Eco Solutions must ensure the mixed feedstock biodiesel policy issued by ARB in 2012¹ is followed to be validated for the mix feedstock CI.

¹ Mixed feedstock biodiesel policy by California Air Resource Board:
<http://www.arb.ca.gov/fuels/lcfs/2a2b/internal/mixed-feedstock-bdrd-120112.pdf>

Staff Analysis and Recommendation

Staff has reviewed Eco Solutions' 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 Eco Solutions' Method 2B application.

On the basis of these findings, staff recommends that Eco Solutions' application for a Method 2B pathway be approved.