

**Staff Summary
Method 2B Application
Neste Singapore Pte Ltd.
Corn Oil from Dry DGS and Wet DGS to Renewable Diesel Pathways
(Pathway Codes: RNWD008 and RNWD026)**

Deemed Complete Date: July 24, 2015
Posted for Comment Date: August 7, 2015
Certified Date: August 18, 2015

Pathway Summary

Neste Singapore Pte Ltd. formerly known as Neste Oil Singapore Pte Ltd. (Neste) produces non-ester renewable diesel (RD) from multiple feedstocks at its plant in Singapore. The plant produces approximately 250 million gallons of RD annually. Neste's non-ester product is marketed under the NExBTL trademark.

Neste has applied for two Method 2B Low Carbon Fuel Standard (LCFS) pathways covering the RD produced at its Singapore plant from corn oil extracted from Dry DGS and Wet DGS. The feedstock is transported 50 miles by truck, 1,700 miles by rail from Midwest ethanol plant to the port of Los Angeles, and 7,677 nautical miles (8,828 miles) by ocean tanker to the Neste plant in Singapore. Once the corn oil has been converted to renewable diesel, the finished fuel is transported an estimated 7,677 nautical miles (8,828 miles) by ocean tanker to Los Angeles.

Neste's process generates a propane-rich off-gas as a co-product. The propane-rich off-gas is produced during the hydrotreatment process. The yield is not feedstock specific. The high pressure portion of this off-gas (both high- and low-pressure gas is generated) is conveyed via a dedicated pipeline to a hydrogen plant located on Jurong Island. There it displaces natural gas that would otherwise have been consumed as both a process fuel and a feedstock at the steam-methane reformer. The hydrogen supplied by the Jurong Island plant is piped back to the Neste plant where it is used for hydrotreatment. The low-pressure propane-rich off-gas is sent to a natural gas steam boiler that provides process heat to the RD plant.

Carbon Intensity of the Fuel Produced

The LCFS lookup table currently contains no pathways covering RD produced in Singapore from corn oil extracted from Dry DGS and Wet DGS. Therefore, the Neste pathways fall under the Method 2B provisions of the LCFS. Because Neste'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).

As shown in the following table, the applicant has calculated its pathway CIs to be 16.73 gCO₂e/MJ for Dry DGS and 39.13 gCO₂e/MJ for Wet DGS. These CIs includes a 3.09 gCO₂e/MJ credit for the natural gas displaced by the propane-rich off-gas from the RD plant. These proposed carbon intensity value includes transportation of the feedstock to the refinery, renewable diesel production, finished fuel transportation to California, and vehicle tailpipe emissions.

Proposed Lookup Table Entries

Fuel	Pathway Identifier	Pathway Description	Carbon Intensity in gCO ₂ e/MJ		
			Direct Emissions	Land Use or other Indirect Effects	Total
Renewable Diesel	RNWD008	2B Application*: Midwest Corn Oil from Dry DGS to Renewable Diesel; Fuel Produced in Singapore	16.73	0	16.73
Renewable Diesel	RNWD026	2B Application*: Midwest Corn Oil from Wet DGS to Renewable Diesel; Fuel Produced in Singapore	39.13	0	39.13

*Specific Conditions Apply

Operating Conditions

Operations at the plant will be subject to the following condition designed to ensure that the CIs of the corn oil from Dry DGS and Wet DGS RD produced at the Singapore plant will remain at or below the value appearing in the table above for all volumes of Corn Oil-based RD 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 Neste 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.

Staff Analysis and Recommendation

Staff has reviewed Neste'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 Neste's Method 2B application.

On the basis of these findings, staff recommends that Neste's application for Method 2B pathways be approved.