

## PRELIMINARY DRAFT SUBMITTED FOR PUBLIC COMMENT

February 22, 2011

### POET LLC Corn Ethanol Method 2A Application

#### Plant Summary

The POET, LLC application contains six distinct dry-mill production processes. With one exception, each of the six processes produces both wet and dry DGS co-products at separate times. However, currently over 97 percent of the DGS produced by the POET facilities is dry. Therefore, the application is for 11 differently defined corn ethanol sub-pathways. The six distinct production processes represent multiple POET facilities. Five of the six POET production processes use a Raw Starch Hydrolysis (RSH) process instead of the conventional dry grind process, which is the basis for the reference pathway carbon intensity values in the LCFS. The RSH process is a cold cook process in which the cooking occurs at lower temperatures than the cooking process used in the conventional process. The RSH process eliminates the liquefaction and saccharification steps. The total energy use is generally lower in the RSH process than the conventional process. A brief summary of the six production processes are as follows: 1) RSH process with natural gas process fuel; 2) RSH process with natural gas process fuel and the use of combined heat and power; 3) RSH process with natural gas, landfill gas, and biomass as process fuel; 4) RSH process with corn fractionation and natural gas process fuel; 5) conventional cook process with natural gas process fuel and the use of combined heat and power; and 6) RSH process with biogas process fuel.

During the public comment period, POET requested that the carbon intensity values for sub-pathways 2 and 4 for 100 percent wet DGS be slightly changed. The staff replicated these carbon intensity values and has proposed these changes as part of the 15-day changes to the regulation.

The carbon intensities for the LCFS reference pathways are 98.40 gCO<sub>2</sub>e for sub-pathways using processes 1), 2), 4), and 5) and producing 100 percent dry DGS, and 90.10 gCO<sub>2</sub>e/MJ for these processes producing 100 percent wet DGS. The reference carbon intensities are 93.60 gCO<sub>2</sub>e/MJ for sub-pathways using processes 3) and 6) and producing 100 percent dry DGS, and 86.80 gCO<sub>2</sub>e/MJ for the sub-pathway using process 6) and producing 100 percent wet DGS. The application contains no sub-pathway using process 3) and producing 100 percent wet DGS. On the basis of the carbon intensity values calculated by POET for each of the sub-pathways, the LCFS substantiality requirement is met.

#### Carbon Intensity of Ethanol Produced

The POET production processes achieve lower carbon intensity values relative to the reference pathway carbon intensity values through three principal means. First, the use of RSH process requires less process heat. Nine of the 11 sub-pathways use the RSH process. Second, four of the 11 sub-pathways use combined heat and power, which reduces the need for grid power and reduces total plant energy. Third, four of the 11 sub-pathways use either biogas, landfill

gas, or waste wood as fuels for process heat, which reduces fossil fuel consumption.

Table 1, below summarizes the carbon intensities, as calculated by POET, of the 11 sub-pathways in the application. The carbon intensity values in the table include a 30 gram per mega joule component for the emissions from indirect land use change. Conditions on amount and type of fuel used and grid electricity uses apply to each of POET's sub-pathways. These conditions are not shown because the values in the conditions are considered confidential business information. The carbon intensity values and conditions for each sub-pathway would apply to each POET plant that is represented by the sub-pathway.

**Table 1: POET Pathway Carbon Intensities**

Sub-Pathway number	Sub-Pathway Description	Carbon Intensity (gCO <sub>2</sub> e/MJ)	
		100% Dry DGS	100% Wet DGS
1	Raw Starch Hydrolysis	92.44	83.69
2	Raw Starch Hydrolysis/Combined Heat and Power	88.49	80.01
3	Raw Starch Hydrolysis/Biomass & Landfill Gas Fuels	88.50	None
4	Raw Starch Hydrolysis/Corn Fractionation	91.66	80.26
5	Conventional Cook/Combined Heat and Power	90.52	80.47
6	Raw Starch Hydrolysis/Biogas Process Fuel	74.70	73.21

### Staff Analysis and Recommendation

The staff has reviewed the POET application. The staff's findings are as follows:

- The staff has replicated, using the CA-GREET spreadsheet, the carbon intensity values calculated by POET for each of the eleven sub-pathways;
- POET has provided documentation for its plants' energy use and ethanol production levels;
- The staff is satisfied that the energy values in the application accurately represent the POET plants' energy values appearing in the application;
- The staff is satisfied that the grid electricity use values in the application accurately represents the POET plants' grid electricity use values claimed in the application;

- Future grid electrical energy and total energy use for the plants, using these pathways will have to be reported to the ARB in order to verify that the grid electrical and total energy values for the POET plants in the application continue to be met;

On the basis of these findings, the staff recommends that POET's application for eleven Method 2A corn ethanol sub-pathways be approved.