

**Staff Summary  
Method 2A Pathway Application  
Western Plains Energy, LLC  
Corn and Sorghum Ethanol  
(ETHC089, ETHC090, ETHG012, ETHG013)**

Deemed Complete Date: October 31, 2013  
Posted for Comment Date: January 28, 2014  
Certified Date: February 28, 2014

**Pathway Summary**

Western Plains Energy, LLC (WPE) produces ethanol from corn and grain sorghum at a dry mill plant in Oakley, Kansas. The WPE plant has a nameplate capacity of 40 million gallons per year of denatured ethanol. In 2012, WPE undertook construction of an anaerobic digester designed to produce enough biogas to meet most of the plant's process thermal energy needs. As construction of the digester proceeded, WPE applied for three corn and three sorghum pathways<sup>1</sup> with carbon intensities (CIs) that accounted for the displacement of natural gas by the digester biogas. Staff certified these pathways in January of 2013. Because WPE's digester facility has taken longer than expected to reach full production, the plant has applied for the four interim pathways described in this staff summary. One corn and one sorghum pathway reflect a thermal energy fuel stream comprised of ten percent biogas, while the remaining corn and sorghum pathways reflect a thermal energy fuel stream comprised of 30 percent biogas.

**Carbon Intensity of Ethanol Produced**

As shown in the following table, WPE is applying for four Method 2A pathways: two sorghum pathways with CIs of 73.31 and 74.88 gCO<sub>2</sub>e/MJ, and two corn pathways with CIs of 75.37 and 76.91 gCO<sub>2</sub>e/MJ. These CIs were calculated based on ethanol production and energy consumption data covering the years 2010 through 2011. Corn ethanol pathway ETHC089 and sorghum ethanol pathway ETHG012 assume that biogas comprises ten percent of the plant's process thermal energy fuel stream, while ETHC090 (corn) and ETHG013 (sorghum) assume that biogas comprises 30 percent of the fuel stream.

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<sup>1</sup> The corn pathways are ETHC073, ETHC074, ETHC075 (with CIs of 68.54, 68.90, and 71.84 gCO<sub>2</sub>e/MJ, respectively). The sorghum pathways are ETHG005, ETHG006, ETHG007 (with CIs of 66.31, 66.67, and 69.61 gCO<sub>2</sub>e/MJ, respectively). The three pathways in each of these two groups are differentiated by the percentage of biogas in the plant's thermal energy fuel stream. The same three percentages—100, 97, and 80 percent—are assumed in both the corn and sorghum group.

### Proposed Lookup Table Entries

	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
Corn Ethanol	ETHC089	2A Application*: Midwest Corn; Dry Mill; Wet DGS; 10% Biogas, 90% NG	46.91	30	76.91
Corn Ethanol	ETHC090	2A Application*: Midwest Corn; Dry Mill; Wet DGS; 30% Biogas, 70% NG	45.37	30	75.37
Sorghum Ethanol	ETHG012	2A Application*: Kansas Sorghum; Dry Mill; Wet DGS; 10% Biogas, 90% NG	44.88	30	74.88
Sorghum Ethanol	ETHG013	2A Application*: Kansas Sorghum; Dry Mill; Wet DGS; 30% Biogas, 70% NG	43.31	30	73.31

\*Specific Conditions Apply

### Operating Conditions

Use of the pathways appearing in the table is subject to the following operating conditions. These conditions must be met at all times, except during planned maintenance or unpredictable, unavoidable, and uncontrollable force majeure events<sup>2</sup>.

- 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 applicant 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. In summary, no segregation of gallons based on process energy consumption shall occur *within* either pathway.
- The energy consumption and GHG emissions associated with the production of biogas at the WPE plant were estimated prospectively in WPE's application. In order to confirm those estimates, WPE will submit copies of all energy purchase invoices for the facility. Submission will start once the biogas supply starts and

<sup>2</sup> To qualify under this exception, maintenance and *force majeure* events must of short duration.

continue until ARB is in receipt of invoices covering two consecutive years of operation. If the digester plant's actual energy consumption proves to be significantly higher than the estimates on which WPE's pathway CIs are based, the affected CIs will be recalculated based on the plant's actual energy consumption and the new CIs will replace the current CIs in the LCFS Reporting Tool.

- WPE's pathway CIs are based on corn and sorghum ethanol yields that are different from the default yield values on which the LCFS reference pathways are based.<sup>3</sup> The staff approval granted in this document shall apply only to ethanol produced at yields that are equal to or higher than those used to calculate the WPE CIs. Should the production yield fall below the values used in its application, WPE shall not sell the ethanol associated with those reduced yields in California under the LCFS pathways appearing in table above.
- The sorghum pathways described in this Summary can only be used with ethanol produced from sorghum grown in that portion of western Kansas in which lime applications are known to not be necessary due to low precipitation and limestone-derived soils. These pathways may not be used for ethanol produced from sorghum grown outside of this region. Nor may these pathways be used for ethanol produced from sorghum grown using lime applications, even if that sorghum was grown within this region.
- The total pathway-specific thermal and electrical energy use values (inclusive of both bio- and natural gas) reported in the WPE Method 2A application shall not be exceeded. These values are classified by the applicant as confidential business information. Pathway-specific energy use values may be calculated using any accounting period up to and including one year.
- The certification granted in this document extends to ethanol production associated with 100 percent wet DGS. The 100 percent wet DGS CI shall only be applied to ethanol volumes produced when no DGS drying occurs. This operating condition applies equally to WPE's corn and sorghum pathways.

In order for WPE to sell ethanol in California under the CIs appearing in the table above, these conditions must be met for every gallon sold.

### **Staff Analysis and Recommendation**

Staff has reviewed the Western Plains Energy, LLC application and has replicated, using the CA-GREET spreadsheet, the carbon intensity values calculated by WPE. Western Plains Energy, LLC has provided documentation verifying the plant's natural gas and electrical energy use. The energy consumed by the biogas digester plant was, however, estimated. Staff is satisfied that the energy values presented in the application accurately represent the plant's actual thermal and electrical energy consumption, and that WPE's digester plant energy consumption estimates are likely to be confirmed by operational data. Consequently, staff believes that the carbon intensity

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<sup>3</sup> WPE's ethanol yield values are classified as confidential business information and not reported herein

values appearing in the table accurately represent the carbon intensity values of the ethanol produced (and to be produced) at the WPE plant. Staff therefore recommends that the WPE's application for Method 2A corn and sorghum ethanol pathways be approved.