

**Golden Grain Energy, LLC
Mason City, Iowa
LCFS Method 2A Application Pathway Summary**

Deemed Complete Date: May 31, 2013
Certified and Posted Date: August 30, 2013

Plant Summary

Golden Grain Energy, LLC (GGE) operates a corn ethanol plant in Mason City, Iowa. The GGE plant has applied for two Method 2A fuel pathways under the California Low Carbon Fuel Standard (LCFS). The GGE plant began operations in December of 2004. It is an ICM-designed facility with a nameplate capacity of 80 million gallons per year (MGY) of denatured ethanol. The air pollution control permit issued to the plant in April of 2006 establishes a maximum operating capacity of 150 MGY. The plant is a dry mill, natural gas-fired facility producing dry distillers' grains with solubles (DDGS), modified distillers' grains with solubles (MDGS), and corn oil. GGE applied for a Method 2A fuel pathway under the LCFS in May of 2011. In June of 2011, staff assigned the GGE pathway an LCFS identification code of ETHC057, and recommended it for Executive Officer approval at a carbon intensity (CI) of 91.33 gCO₂e/MJ.¹

In April of 2013, GGE requested that its pathway CI be reduced to 88.92 gCO₂e/MJ, citing an error in the natural gas heating value used to calculate the pathway CI. At the time the original application was submitted, the applicant believed that the energy amounts shown on the invoices from the natural gas supplier were lower heating values (LHV). The applicant has since confirmed that they were actually gross or higher heating values (HHV). Recalculating the pathway CI using the LHV reduced GGE's CI to 88.92 gCO₂e/MJ. Staff certified this adjusted GGE pathway on May 17, 2013. The pathway retained its LCFS Identification code of ETHC057.

In May of 2013, GGE applied for the two new pathways described in this staff summary—one associated with its DDGS production and one with its MDGS production. The CIs of both new pathways reflect the HHV-LHV adjustment described above. Upon certification of these two new pathways, ETHC057 will be discontinued.

Carbon Intensity of Ethanol Produced

As shown in Table 1, the applicant is applying for two new pathways with carbon intensities (CIs) of 88.66 gCO₂e/MJ for 100 percent Dry DGS and 82.23 gCO₂e/MJ for Modified DGS. The 100 percent dry DGS CI of 88.66 gCO₂e/MJ is slightly below the prior ETHC057 CI of 88.92 gCO₂e/MJ, even though ETHC057 is based on dry and a small amount of modified DGS. The reason for this is that the two pathway CIs described in this summary were calculated based on a current two-year energy consumption data

¹ This and all staff-approved LCFS pathways are posted to <http://www.arb.ca.gov/fuels/lcfs/2a2b/2a-2b-apps.htm>

set. ETHC057 was based on an earlier energy consumption data set covering less than two years.²

The proposed Method 2A pathways must be evaluated against a reference pathway from the LCFS Lookup table. Under the LCFS, the reference pathway for corn ethanol associated with any level of DGS drying is the most similar dry DGS pathway. The reference pathway for both GGE pathways, therefore, is the Midwestern, dry mill, gas-fired, dry DGS pathway, which has a CI of 98.40 gCO₂e/MJ. The production process for the proposed pathways must not differ significantly from the production process specified for the reference pathway. The proposed 2A pathway CIs must also improve upon the reference pathway CI by five or more gCO₂e/MJ.³ The two GGE pathways meet these criteria.

As a condition of LCFS certification, thermal energy and electricity use shall not exceed the current values that are classified by the applicant as confidential business information.

Table 1. Proposed Lookup Table Entries for the Golden Grain Energy Plant

Fuel	Pathway Identifier	Pathway Description	Carbon Intensity Values (gCO ₂ e/MJ)		
			Direct Emissions	Land Use or Other Indirect Effect	Total
Ethanol from Corn	ETHC083	2A Application*: Midwest Dry Mill; Dry DGS; NG	58.66	30	88.66
	ETHC084	2A Application*: Midwest Dry Mill; Modified DGS; NG	52.23	30	82.23

*Specific conditions apply.

Staff Analysis and Recommendation

Staff has reviewed the GGE application and has replicated, using the CA-GREET spreadsheet, the carbon intensity values calculated by GGE. GGE has provided documentation of the plant’s thermal and electrical energy use. Staff is satisfied that the energy values presented in the application accurately represent the plant’s actual thermal and electrical energy consumption. Staff believes that GGE is capable of maintaining operations at or below these CI levels. Consequently, staff believes that the carbon intensity values of 88.66 gCO₂e/MJ for the dry DGS and 82.23 gCO₂e/MJ for the modified DGS pathways accurately represent the carbon intensity values of the GGE plant. Staff recommends, therefore,

² ETH057 was based on a DDGS-MDGS mix of 98% and 2%, and a natural gas and electricity consumption data set covering 12 months in 2009-2010. The two pathways described in this summary are based on a natural gas and electricity consumption data set covering 24 months in 2011-2013

³ In the LCFS regulation, this 5 gCO₂e/MJ threshold is referred to as the “substantiality requirement.”

- That the two GGE Method 2A corn ethanol pathways (ETHC083 and ETHC084) described in this staff summary be certified;
- That both pathways take effect on the date they are posted to the public LCFS Method 2 website and apply solely to fuel volumes sold on and after that date; and
- That pathway ETHC057 be discontinued upon certification of pathways ETHC083 and ETHC084.⁴

⁴ Upon being discontinued, ETHC057 will remain associated with transactions involving that pathway that were in progress at the time ETHC083 and ETHC084 were certified. It will no longer be available for new transactions.