

Aemetis Advanced Fuels Keyes, Inc. Corn and Grain Sorghum Pathways CA-GREET Model

The applicant has conducted its analysis of direct effects on carbon intensity for this pathway using CA-GREET, v.1.8b (Dec. 2009) (See http://www.arb.ca.gov/fuels/lcfs/ca_greet1.8b_dec09.xls). The standard inputs and parameters specified in CA-GREET remain unchanged except as noted in the input table below. The input table below specifies the spreadsheet location of the CA-GREET inputs and other parameters that were claimed as confidential business information or trade secret by the applicant, but it does not disclose the actual value of such inputs and parameters because they are claimed to be confidential business information or trade secret.

Aemetis Input data table (Locations of cells containing Confidential Business Information are shown, but the actual values of such confidential information are not disclosed):

Table 1: Midwest Corn Pathways

CA-GREET Model Sheet Name	Cell number	Default Pathway Value	California Dry Mill, NG, 100% WDGS Pathway Value	Aemetis Keyes, California Pathway Value	Units	Description	Comments
Regional LT	C2	U.S. Average-Midwest	Midwest- CA Marginal	Midwest- CA Marginal	n/a	Region for Analysis	Using Midwest for corn and CA-Marginal for CA ethanol production
Fuel_Prod_TS	L277	36,000	22,140	Business Confidential	btu/gal	Corn Ethanol Plant Energy Use, Dry Mill	With modern plant, lower power use
Fuel_Prod_TS	D277	2.72	2.72	Business Confidential	gal/bu	Ethanol yield of Corn Ethanol Plant, Dry Mill	With modern plant, optimized yield
EtOH	C101	5.34	5.34	Business Confidential	#DGS/bu	DGS yield	Varies with ethanol yield and other factors
T&D_Flowcharts	F1308	0%	100%	Business Confidential	%	Corn from Field to Stack	No change. Shown for reference only
T&D_Flowcharts	F1309	10	10	Business Confidential	miles	Corn from Field to Stack	No change. Shown for reference only
T&D_Flowcharts	M1308	0%	100%	Business Confidential	%	Corn % by Rail from Stack to Ethanol Plant	
T&D_Flowcharts	M1309	400	1,440	Business Confidential	miles	Distance from Corn Stack to Ethanol Plant	
T&D_Flowcharts	M1440	100%	100%	Business Confidential	%	Ethanol terminal to station	No change. Shown for reference only
T&D_Flowcharts	M1441	50	50	Business Confidential	miles	Truck to refueling station distance	No change. Shown for reference only
T&D_Flowcharts	F1441	100%	0%	Business Confidential	%	Percent shipped by rail	
T&D_Flowcharts	F1445	70%	100%	Business Confidential	%	Percent shipped by truck to Bulk Terminal	
T&D_Flowcharts	F1446	40	40	Business Confidential	miles	Percent shipped by truck to Bulk Terminal	No change. Shown for reference only
Inputs	C247	10.19%	10.172%	Business Confidential	%	Share of process energy for Electricity	With modern plant, lower power use

Table 2: California Corn Pathways

CA-GREET Model Sheet Name	Cell number	Default Pathway Value	California Dry Mill, NG, 100% WDGS	Aemetis Keyes, California	Units	Description	Comments
			Pathway Value	Pathway Value			
Regional LT	C2	U.S. Avg-Midwest	Midwest- CA Marginal	CA Average	n/a	Region for Analysis	Used for pathway with California Corn as feedstock
T&D_Flowcharts	M1308	0%	100%	Business Confidential	n/a	Corn % by Rail from Stack to Ethanol Plant	CA corn, none by rail, all by truck
T&D_Flowcharts	M1313	100%	0%	Business Confidential	n/a	Corn Per cent by Truck from Stack to Ethanol Plant	Trucking accounted for in F1309
T&D_Flowcharts	F1309	10	10	Business Confidential	miles	Corn from Field to Stack	Distance from field to Ethanol Plant
Fuel_Prod_TS	T263	1,202.0	1,202.0	Business Confidential	grams/ bushel	CaCO3 Fertilizer Use for Corn Farming	No lime used due to naturally high soil pH

Table 3: Landfill Gas Fuel Corn Pathways

CA-GREET Model Sheet Name	Cell number	Default Pathway Value	California Dry Mill, NG, 100% WDGS Pathway Value	Aemetis Keyes, California Pathway Value	Units	Description	Comments
Fuel_Prod_TS	L277	36,000	22,140	Business Confidential	btu/gal	Corn Ethanol Plant Energy Use, Dry Mill	The only energy input for ethanol production is for power
Inputs	C247	10.19%	10.172%	Business Confidential	%	Share of process energy for Electricity	The only energy input for ethanol production is for power

Table 4: Grain Sorghum Pathways

CA-GREET Model Sheet Name	Cell number	Grain Sorghum 100% WDGS Pathway Value	California Dry Mill, NG, 100% WDGS Pathway Value	Aemetis Keyes, Grain Sorghum Pathway Value	Units	Description	Comments
Fuel_Prod_TS	CU271	26,100	22,140	Business Confidential	btu/gal	Corn Ethanol Plant Energy Use, Default is 100% Dry Mill	Input added by CARB for Grain Sorghum default pathway. With modern plant, lower power use
Fuel_Prod_TS	DS 257	357.6	357.6	Business Confidential	g/bu	CaCO2 (Lime) used as fertilizer	No lime used in the region where Stockton sources its milo
Inputs	E247	10.19%	10.172%	Business Confidential	%	Electricity used as % of total energy used for ethanol production	Input added by CARB for Grain Sorghum default pathway. With modern plant, optimized yield
Inputs	E254	22,430	19,888	Business Confidential	btu/gal	Process fuel for 100% WDGS	Input added by CARB for Grain Sorghum default pathway.
Inputs	E258	0.78	0.66	Business Confidential	kwh/gal	Electricity used for ethanol production	Shown here for reference only.
EtOH	AF101	5.34	5.34	Business Confidential	#DGS/gal	DGS yield	Varies with ethanol yield and other factors
EtOH	DH165	2,661	2,252	Business Confidential	btu/gal	Electricity used for ethanol production	Shown here for reference only.
Inputs	D235	2.72	2.72	Business Confidential	gal/bu	Ethanol yield of Dry Mill using Grain Sorghuma	Input added by CARB for Grain Sorghum default pathway.

Table 5: Landfill Gas Fuel Grain Sorghum Pathways

CA-GREET Model Sheet Name	Cell number	Grain Sorghum 100% WDGS Pathway Value	California Dry Mill, NG, 100% WDGS Pathway Value	Aemetis Keyes, Grain Sorghum Pathway Value	Units	Description	Comments
Fuel_Prod_TS	CU271	22,430	19,888	Business Confidential	btu/gal	Corn Ethanol Plant Energy Use, Default is 100% Dry Mill	Input added by CARB for Grain Sorghum default pathway.
Inputs	E254	22,430	19,888	Business Confidential	btu/gal	Process fuel for 100% WDGS	Input added by CARB for Grain Sorghum default pathway.
Inputs	E247	10.19%	10.172%	Business Confidential	%	Electricity used as % of total energy used for ethanol production	Input added by CARB for Grain Sorghum default pathway. With modern plant, optimized yield