Clean Energy Fuels

CA-GREET Model for Pinnacle CNG Pathway

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 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. These tables can also be found in the technical reports.

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

Parameter	Unit	Value	CA-GREET Cell Changed
LFG Recovery and Transport			
Thermal	Btu/MMBtu	**Confidential**	CA-GREET Default (L85)
Electricity	Btu/MMBtu	**Confidential**	CA-GREET Default[1] (L91)
Total Energy	Btu/MMBtu	**Confidential**	N/A
LFG Plant			NG Tab
LFG Processing Efficiency	%	**Confidential**	AI66 (via C182)
Electricity Fuel Share	%	**Confidential**	AI79 (via C184)
LFG Fuel Share	%	**Confidential**	AI75 (via C183)
Natural Gas Fuel Share	%	**Confidential**	AI76 (via C185)
Electricity	kWh/MMBtu	**Confidential**	N/A
Electricity	Btu/MMBtu	**Confidential**	Calculated in CA-GREET (AI91)
Natural Gas	Btu/MMBtu	**Confidential**	Calculated in CA-GREET (AI85)
LFG	Btu/MMBtu	**Confidential**	Calculated in CA-GREET (AI87)
Credit for Not Flaring	Btu/MMBtu	**Confidential**	Calculated in CA-GREET (AJ88)
Total Energy	Btu/MMBtu	**Confidential**	N/A
Electricity Grid Mix			Regional LT Tab
Residual oil	%	0.8	J83
Natural gas	%	27.9	J84
Coal	%	69.9	J85
Nuclear	%	0	J86
Biomass	%	0.5	J87
Other (renewables)	%	0.9	J88
Natural Gas Transport			T&D Flowcharts Tab (via NG Tab)
Pipeline Distance	mi	2,210	F479 (via E148)

[1] http://www.arb.ca.gov/fuels/lcfs/022709lcfs_lfg.pdf, pages 9-10.

Compression			NG Tab
Electricity	kWh/GGE	**Confidential**	N/A
Compression Efficiency	%	**Confidential**	AA66
Electricity Fuel Share	%	**Confidential**	AA79
Natural Gas Fuel Share	%	**Confidential**	AA75
Electricity	Btu/MMBtu	**Confidential**	Calculated in CA-GREET (AA91)

Clean Energy Fuels

CA-GREET Model for Pinnacle LNG Pathway

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 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. These tables can also be found in the technical reports.

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Parameter	Unit	Value	CA-GREET Cell Changed
LFG Recovery and Transport			
Thermal	Btu/MMBtu	**Confidential**	CA-GREET Default (L85)
Electricity	Btu/MMBtu	**Confidential**	CA-GREET Default[1] (L91)
Total Energy	Btu/MMBtu	**Confidential**	N/A
LFG Plant			NG Tab
LFG Processing Efficiency	%	**Confidential**	AI66 (via C182)
Electricity Fuel Share	%	**Confidential**	AI79 (via C184)
LFG Fuel Share	%	**Confidential**	AI75 (via C183)
Natural Gas Fuel Share	%	**Confidential**	AI76 (via C185)
Electricity	kWh/MMBtu	**Confidential**	N/A
Electricity	Btu/MMBtu	**Confidential**	Calculated in CA-GREET (AI91)
Natural Gas	Btu/MMBtu	**Confidential**	Calculated in CA-GREET (AI85)
LFG	Btu/MMBtu	**Confidential**	Calculated in CA-GREET (AI87)
Credit for Not Flaring	Btu/MMBtu	**Confidential**	Calculated in CA-GREET (AJ88)
Total Energy	Btu/MMBtu	**Confidential**	N/A
Electricity Grid Mix			Regional LT Tab
Residual oil	%	0.8	J83
Natural gas	%	27.9	J84
Coal	%	69.9	J85
Nuclear	%	0	J86
Biomass	%	0.5	J87
Other (renewables)	%	0.9	J88

[1] http://www.arb.ca.gov/fuels/lcfs/022709lcfs_lfg.pdf, pages 9-10.

Natural Gas Transport			T&D Flowcharts Tab (via NG Tab)
Pipeline Distance	mi	2,114	F479 (via E148)
Liquefaction			NG Tab
Electricity	kWh/Gallon	**Confidential**	N/A
Liquefaction Efficiency	%	**Confidential**	AD66
Electricity Fuel Share	%	**Confidential**	AD79
Natural Gas Fuel Share	%	**Confidential**	AD75
Electricity	Btu/MMBtu	**Confidential**	Calculated in CA-GREET (AD91)
LNG Transport			T&D Tab
Truck LNG Fuel Share	%	90	CD97
Truck Diesel Fuel Share	%	10	CD95
LNG Storage			Inputs Tab
Boil-Off Rate: % per Day	%/day	0.05 / 0.1	E171 / F171
Duration of Storage or Transit: Days	Days	5 / 0.1	E174 / F174
Recovery Rate for Boil-Off Gas	%	80% / 80%	E179 / F179
L/CNG			NG Tab
L/CNG Conversion	gCO2e/MJ	2.89	J171