

BIOX Corporation

CA-GREET Model for Used Cooking Oil

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.

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

Parameters	Cell Locations	Original GREET values	Company values	Note
Electric Power	C83-Regional LT	2.7%	0.0%	Ontario Marginal Power
	C84-Regional LT	18.9%	94.7%	
	C85-Regional LT	50.7%	0.0%	
	C86-Regional LT	18.7%	0.0%	
	C87-Regional LT	1.3%	0.0%	
	C88-Regional LT	7.7%	4.9%	
UCO transport	IH93-T&D	50	25	Transportation distance
Biodiesel Transportation (100% Rail Pathway)	AC 1388-T&D Flowchart	1200	0	
Total Energy	B13-UCO BD	2,116	3,131	BD Processing Energy
Yield	B21-UCO BD	1.11	1.00	
NG	F174-UCO BD	42.0%	56.2%	
Power	F177-UCO BD	2.2%	6.2%	
Methanol	F179-UCO BD	40.9%	27.6%	
Sodium Hydroxide	F180-UCO BD	2.0%	1.3%	
Sodium Methylate	F181-UCO BD	9.9%	6.7%	
Hydrochloric acid	F182-UCO BD	3.0%	2.0%	
Rail Transport	F1394-T&D Flowchart	1400	2500	BD Transport
HD Truck Transport	F1398-T&D Flowchart	50	50	

HD Truck Transport	M1390-T&D Flowchart	90	90	
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CA-GREET Model for tallow

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.

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

Parameters	Cell Locations	Original GREET values	Company values	Note
Electric Power	C83-Regional LT	2.7%	0.0%	Ontario Marginal Power
	C84-Regional LT	18.9%	94.7%	
	C85-Regional LT	50.7%	0.0%	
	C86-Regional LT	18.7%	0.0%	
	C87-Regional LT	1.3%	0.0%	
	C88-Regional LT	7.7%	4.9%	
Tallow transport	IE93-T&D	50	400	Transportation distance
Total Energy	B12-Tallow BD	2,116	3,131	BD Processing Energy
Yield	B19-Tallow BD	1.11	1.00	
NG	D172- Tallow BD	42.0%	56.2%	
Power	D175- Tallow BD	2.2%	6.2%	
Methanol	D177- Tallow BD	40.9%	27.6%	
Sodium Hydroxide	D178- Tallow BD	2.0%	1.3%	
Sodium Methylate	D179- Tallow BD	9.9%	6.7%	
Hydrochloric acid	D180- Tallow BD	3.0%	2.0%	
Rail Transport	F1394-T&D Flowchart	1400	2500	BD Transport
HD Truck Transport	F1398-T&D Flowchart	50	50	
HD Truck Transport	M1390-T&D Flowchart	90	90	

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CA-GREET Model for soy oil

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.

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

Parameters	Cell Locations	Original GREET values	Company values	Note
Electric Power	C83-Regional LT	2.7%	0.0%	Ontario Marginal Power
	C84-Regional LT	18.9%	94.7%	
	C85-Regional LT	50.7%	0.0%	
	C86-Regional LT	18.7%	0.0%	
	C87-Regional LT	1.3%	0.0%	
	C88-Regional LT	7.7%	4.9%	
Soyoil transport	GB93-T&D	50	5	Transportation distance
Total Energy	B12- BD	2,116	3,131	BD Processing Energy
Yield	B19- BD	1.11	1.00	
NG	M172- BD	42.0%	56.2%	
Power	M175- BD	2.2%	6.2%	
Methanol	M177- BD	40.9%	27.6%	
Sodium Hydroxide	M178- BD	2.0%	1.3%	
Sodium Methylate	M179- BD	9.9%	6.7%	
Hydrochloric acid	M180- BD	3.0%	2.0%	
Rail Transport	F1394-T&D Flowchart	1400	2500	BD Transport
HD Truck Transport	F1398-T&D Flowchart	50	50	
HD Truck Transport	M1390-T&D Flowchart	90	90	

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CA-GREET Model for corn oil

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.

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

Parameters	Cell Locations	Original GREET values	Company values	Note
Electric Power	C83-Regional LT	2.7%	0.0%	Ontario Marginal Power
	C84-Regional LT	18.9%	94.7%	
	C85-Regional LT	50.7%	0.0%	
	C86-Regional LT	18.7%	0.0%	
	C87-Regional LT	1.3%	0.0%	
	C88-Regional LT	7.7%	4.9%	
Corn Oil transport truck	IG93-T&D	50	190	Transportation distance
Corn Oil transport rail	IH93-T&D	1400	0	
Biodiesel Transportation (100% Rail Pathway)	AC 1388-T&D Flowchart	1200	0	
ETOH	C252 to C256		See Below	UCO tran for corn oil
ETOH	C276 to C280		See Below	BD Transport
ETOH	B276 to B280		See Below	BD Transport
Total Energy	B12- BD	2,116	3,131	BD Processing Energy
Yield	B19- BD	1.11	1.00	
NG	M172- BD	42.0%	56.2%	
Power	M175- BD	2.2%	6.2%	
Methanol	M177- BD	40.9%	27.6%	
Sodium Hydroxide	M178- BD	2.0%	1.3%	
Sodium Methylate	M179- BD	9.9%	6.7%	
Hydrochloric acid	M180- BD	3.0%	2.0%	
Rail Transport	F1394-T&D Flowchart	1400	2500	BD Transport
HD Truck Transport	F1398-T&D Flowchart	50	50	
HD Truck Transport	M1390-T&D Flowchart	90	90	

Additional model changes required to produce the results by stage.

C252 = ('T&D'!IG117)/2000/454/BD!C27*Fuel_Specs!E29/Fuel_Specs!B29*1000000

C253 = ('T&D'!IG118)/2000/454/BD!C27*Fuel_Specs!E29/Fuel_Specs!B29*1000000
C254 = ('T&D'!IG123)/2000/454/BD!C27*Fuel_Specs!E29/Fuel_Specs!B29*1000000
C255 = ('T&D'!IG124)/2000/454/BD!C27*Fuel_Specs!E29/Fuel_Specs!B29*1000000
C256 = ('T&D'!IG125)/2000/454/BD!C27*Fuel_Specs!E29/Fuel_Specs!B29*1000000
C276 = 'T&D'!CL150+BD!Q212+BD!Q213
C277 = 'T&D'!CL151
C278 = 'T&D'!CL156
C279 = 'T&D'!CL157
C280 = 'T&D'!CL158
B276 = 'T&D'!CM150
B277 = 'T&D'!CM151
B278 = 'T&D'!CM156
B279 = 'T&D'!CM157
B280 = 'T&D'!CM158

BIOX Corporation

CA-GREET Model for canola oil

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.

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Electric Power	C83-Regional LT	2.7%	0.0%	Ontario Marginal Power
	C84-Regional LT	18.9%	94.7%	
	C85-Regional LT	50.7%	0.0%	
	C86-Regional LT	18.7%	0.0%	
	C87-Regional LT	1.3%	0.0%	
	C88-Regional LT	7.7%	4.9%	
Canola oil	GB93-T&D	0	5	Transportation

transport				distance
Canola oil Transportation (100% Rail Pathway)	AC 1388-T&D Flowchart	1200	0	
Total Energy	C12- BD	2,116	3,131	BD Processing Energy
Yield	C19- BD	1.11	1.00	
NG	AZ172- BD	42.0%	56.2%	
Power	AZ175- BD	2.2%	6.2%	
Methanol	AZ177- BD	40.9%	27.6%	
Sodium Hydroxide	AZ178- BD	2.0%	1.3%	
Sodium Methylate	AZ179- BD	9.9%	6.7%	
Hydrochloric acid	AZ180- BD	3.0%	2.0%	
Rail Transport	F1394-T&D Flowchart	1400	2500	
HD Truck Transport	F1397-T&D Flowchart	50	50	
HD Truck Transport	M1390-T&D Flowchart	90	90	