World Biofuels

World Ethanol

The world ethanol price increased 13.7% in 2008, to $1.76 per gallon. It is projected to decrease by almost 16%, to $1.48 per gallon, in 2009 because of the dramatic drop in crude oil prices coupled with a significant reduction in U.S. ethanol imports. The ethanol price continues its downward trend until 2011, after which it begins to increase because of higher ethanol demand from the U.S. brought about by the EISA 2007 biofuel mandates. World net trade increased by 20.2% in 2008; it decreases in 2009 by 1.3%. As world demand for ethanol increases more than production over the projection period, net trade is expected to rise by 302.5%, reaching 4.9 billion gallons by 2018.

Brazil's ethanol production totaled 6.7 billion gallons in 2008, an increase of 21%. This translates into 293.3 mmt of sugarcane used in ethanol production. Production of ethanol in Brazil increases 111.2% by the end of the projection period, to 14.1 billion gallons. Sugarcane used in ethanol production increases 88.2%, reaching 552 mmt by 2018. Brazil's ethanol consumption increased in 2008 by 21.3%, to 5.5 billion gallons. Its ethanol consumption is projected to increase 66.9% by 2018. Brazil's net ethanol exports reach 4.9 billion gallons in 2018, an increase of 320.4%, partly because of the increase in U.S. ethanol import demand.

Ethanol production in the EU increased almost 26% in 2008. EU ethanol production is projected to reach 1.6 billion gallons in 2018, an increase of 175.1%. Consumption in the EU increased 26.2% in 2008, to 0.9 billion gallons. It is expected to reach 2.2 billion gallons in 2018, an increase of 146% over the decade. Total EU biofuels consumption reaches 3.1% of transport fuels in 2018. EU net imports rise from 318 million gallons in 2008 to 617 million gallons by 2018 as consumption increases more than production.

Chinese fuel ethanol production increased 9.3% in 2008, to 500 million gallons. Production is projected to continue to increase and reach 622.8 million gallons by 2018. Ethanol consumption in China increased in 2008 to 448 million gallons. It increases 59.2%, to 713.8 million gallons, by 2018. China becomes a net importer of ethanol in 2011. Its net imports reach 91 million gallons in 2018.

In India, ethanol is produced mainly from molasses, a co-product in sugar production from sugarcane. India's ethanol production decreased by 9.8%, from 571 million gallons in 2007 to 515 million gallons in 2008 because of a decline in sugarcane production. Production rises to 578 million gallons in 2018, an increase of 12.2%. Consumption of ethanol in India was 490 million gallons in 2008 and is projected to increase 51%, to 739.5 million gallons, in 2018. India's net imports increase to 171.6 million gallons in 2018.

World Biodiesel

The world price of biodiesel (Central Europe FOB) decreases to $3.74 per gallon in 2009, driven by a lower crude oil price and large supplies in the world market. The price then recovers as EU countries attempt to achieve their biofuel targets and because of rebounding crude oil prices. Expanded production in Argentina and Brazil also contributes to the temporary price decline and to a sharp increase in exports before the start of the countries' B5 mandates. However, the world price increases to $5.56 per gallon by 2018, driven by higher demand from the EU. World net trade plunges in 2010 as Argentina, Brazil, and Indonesia increase their mandate-driven consumption. Net trade averages 786 million gallons over the rest of the baseline, driven mainly by strong EU demand.

Currently, the EU has the world's most developed biodiesel industry. Production increased 6% in 2008, but it declines 7% in 2009 because of strong competition from abroad. Domestic production then recovers and reaches 2.6 billion gallons by 2018. Pushed by the biofuel target, domestic consumption continues to grow during the outlook period, reaching 2.9 billion gallons by 2018. The biodiesel share of diesel in transport is, however, still only 4.2%. Net imports increase rapidly between 2008 and 2009 as a sizeable volume of biodiesel is delivered from Argentina and Brazil. However, net imports slow down when these two countries' B5 mandates are executed in 2010. Net imports are expected to hit 291 million gallons at the end of the decade.

Encouraged by its biodiesel mandate and the world market, Argentina's biodiesel production expands from 269 million gallons to 500 million gallons between 2008 and 2018. Domestic consumption jumps significantly in 2010 as the B5 mandate is exercised. Consumption continues to increase for the remainder of the outlook period but at a slower pace, hitting 230 million gallons by 2018. Net exports grow to 320 million gallons in 2009 and then drop by 41% the following year because of the mandate. Trade rebounds in 2011 and grows to 270 million gallons by 2018.

Similar to the outlook in Argentina, Brazil's biodiesel production is motivated by its mandate and the international market. Production increases to 875 million gallons by the end of the decade. Consumption jumps in 2008, 2009, and 2010 because of the mandate (B2.5 by 2008, B3 by 2009, and B5 by 2010). Domestic use is projected to reach 719 million gallons by 2018. Because of the mandate, Brazil's net exports drop by 59% in 2010 and then grow for the remainder of the outlook, supplying 157 million gallons by 2018.

Indonesian production increased from 30 million gallons in 2007 to 105 million gallons in 2008, driven by strong production margins. The growth in the industry slows down over the rest of the baseline because of a rise in palm oil prices relative to biodiesel. By the end of the period, production hits 309 million gallons. A domestic consumption mandate is implemented starting in 2009. As the mandate-driven consumption increases, net exports decline from their peak of 173 million gallons in 2012 to 112 million gallons in 2018.

Ethanol Trade

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Net Exporters					(Million Gallons)						
Brazil	1,165	1,169	1,466	1,820	2,124	2,395	2,818	3,268	3,647	4,236	4,896
China	52	31	13	-9	-21	-35	-44	-54	-67	-78	-91
Total Net Exports *	1,216	1,201	1,479	1,820	2,124	2,395	2,818	3,268	3,647	4,236	4,896
Net Importers											
Canada	165	260	312	364	412	460	503	550	599	657	711
European Union	318	318	352	401	436	467	494	523	559	586	617
India	0	23	59	90	107	120	130	139	153	163	172
Japan	149	196	234	273	308	343	377	412	447	481	516
South Korea	81	104	132	154	175	195	215	236	257	276	297
United States	436	195	250	353	454	528	772	1,037	1,211	1,605	2,070
ROW	67	104	140	176	212	247	282	317	353	388	423
Total Net Imports *	1,216	1,201	1,479	1,820	2,124	2,395	2,818	3,268	3,647	4,236	4,896
Prices					(U.S. Dollars per Gallon)						
Anhydrous Ethanol Price, Brazil **	1.76	1.48	1.36	1.29	1.34	1.37	1.45	1.51	1.53	1.62	1.69
Ethanol, FOB Omaha	2.47	1.68	1.75	1.81	1.91	1.99	2.10	2.19	2.17	2.06	2.00

Note: 1 gallon = 3.7857 liters; 1 metric ton = 1237.1644 liters.
* Total net exports are the sum of all positive net exports.
** Represents world ethanol price.

Biodiesel Trade

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Net Exporters					(Million Gallons)						
Argentina	264	320	188	218	239	253	262	268	270	271	270
Brazil	-1	167	69	103	127	144	154	160	162	161	157
Indonesia	102	117	149	166	173	171	165	155	143	128	112
Malaysia	51	47	48	48	48	48	48	47	47	47	47
United States	353	322	284	244	199	178	174	178	184	187	184
Total Net Exports *	771	974	737	779	785	794	803	809	806	794	769
Net Importers											
European Union	300	487	253	296	304	313	323	329	327	315	291
Japan	4	19	17	16	15	15	15	15	15	14	14
ROW	465	468	468	467	466	466	466	465	465	465	464
Total Net Imports *	771	974	737	779	785	794	803	809	806	794	769
Prices					(U.S. Dollars per Gallon)						
Central Europe FOB Price **	5.25	3.74	4.08	4.47	4.73	4.86	5.02	5.14	5.28	5.43	5.56
Biodiesel Plant	4.64	3.45	3.53	3.84	4.12	4.24	4.33	4.41	4.49	4.59	4.69

Note: 1 gallon = 3.7857 liters; 1 metric ton = 1136.36 liters.
* Total net exports are the sum of all positive net exports.
** Represents world biodiesel price.

U.S. Biofuels Production and Consumption

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Ethanol					(Million Gallons)						
Production	9,262	10,295	11,504	12,384	13,185	13,715	14,508	15,320	15,990	16,361	16,736
Consumption	9,511	10,387	11,680	12,693	13,597	14,220	15,243	16,318	17,163	17,936	18,781
Net Trade	-436	-195	-250	-353	-454	-528	-772	-1,037	-1,211	-1,605	-2,070
Biodiesel											
Production	677	804	921	1,040	1,149	1,178	1,174	1,178	1,184	1,187	1,184
From Soybean Oil	394	429	496	578	656	668	657	658	661	663	660
From Other Fats and Oils	284	375	425	462	493	510	517	520	522	524	525
Consumption	324	482	638	796	950	1,000	1,000	1,000	1,000	1,000	1,000
Net Trade	353	322	284	244	199	178	174	178	184	187	184

Argentine Biofuels Production and Consumption

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Biodiesel					(Million Gallons)						
Production	269	333	380	414	439	458	472	482	490	496	500
Consumption	6	13	192	196	200	205	210	214	219	225	230
Net Trade	264	320	188	218	239	253	262	268	270	271	270
Use in Biodiesel Production					(Thousand Metric Tons)						
Soybean Oil	941	1,157	1,314	1,427	1,507	1,564	1,604	1,631	1,649	1,661	1,667

Brazilian Biofuels Production and Consumption

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Ethanol					(Million Gallons)						
Production	6,673	7,749	8,546	9,140	9,662	10,190	10,843	11,558	12,258	13,119	14,091
Consumption	5,509	6,508	7,067	7,318	7,539	7,796	8,027	8,291	8,612	8,885	9,197
Net Trade	1,165	1,169	1,466	1,820	2,124	2,395	2,818	3,268	3,647	4,236	4,896
Use in Ethanol Production					(Thousand Metric Tons)						
Sugarcane	293,259	326,134	356,811	378,589	397,029	415,414	438,506	463,708	487,905	518,019	551,996
Biodiesel					(Million Gallons)						
Production	291	528	682	728	765	794	818	837	853	865	875
Consumption	266	361	613	626	638	651	664	677	691	704	719
Net Trade	-1	167	69	103	127	144	154	160	162	161	157
Use in Biodiesel Production					(Thousand Metric Tons)						
Soybean Oil	863	1,557	1,997	2,115	2,205	2,273	2,323	2,359	2,384	2,400	2,408

Canadian Biofuels Production and Consumption

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Ethanol					(Million Gallons)						
Production	222	247	261	261	263	266	271	275	284	292	301
Consumption	387	507	573	625	675	726	774	825	883	949	1,012
Net Trade	-165	-260	-312	-364	-412	-460	-503	-550	-599	-657	-711
Use in Ethanol Production					(Thousand Metric Tons)						
Corn	1,615	1,796	1,898	1,898	1,914	1,936	1,969	2,003	2,064	2,122	2,191
Wheat	695	772	816	816	823	832	847	861	887	912	942

Chinese Biofuels Production and Consumption

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Ethanol					(Million Gallons)						
Production	500	509	516	522	535	548	562	577	591	607	623
Consumption	448	478	503	531	556	582	607	631	659	686	714
Net Trade	52	31	13	-9	-21	-35	-44	-54	-67	-78	-91
Use in Ethanol Production					(Thousand Metric Tons)						
Corn	3,403	3,630	3,690	3,737	3,798	3,890	3,985	4,091	4,197	4,303	4,417

European Union Biofuels Production and Consumption

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Ethanol					(Million Gallons)						
Production	569	683	800	889	983	1,079	1,178	1,276	1,370	1,469	1,566
Consumption	887	1,001	1,152	1,290	1,420	1,547	1,672	1,799	1,930	2,056	2,183
Net Trade	-318	-318	-352	-401	-436	-467	-494	-523	-559	-586	-617
Use in Ethanol Production					(Thousand Metric Tons)						
Wheat	1,385	1,663	1,947	2,163	2,393	2,627	2,868	3,105	3,335	3,576	3,812
Corn	378	453	531	590	653	716	782	847	910	975	1,040
Barley	630	756	885	983	1,088	1,194	1,304	1,411	1,516	1,625	1,733
Biodiesel					(Million Gallons)						
Production	1,711	1,594	2,048	2,148	2,228	2,257	2,325	2,386	2,454	2,527	2,617
Consumption	2,012	2,083	2,303	2,446	2,533	2,571	2,649	2,716	2,782	2,844	2,909
Net Trade	-300	-487	-253	-296	-304	-313	-323	-329	-327	-315	-291
Use in Biodiesel Production					(Thousand Metric Tons)						
Rapeseed Oil	5,077	3,131	4,439	4,713	5,022	5,265	5,533	5,723	5,933	6,156	6,343
Soybean Oil	702	1,074	1,260	1,284	1,291	1,264	1,253	1,233	1,217	1,200	1,184
Sunflower Oil	54	474	504	515	526	528	532	535	539	543	549

Indian Biofuels Production and Consumption

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Ethanol					(Million Gallons)						
Production	515	497	488	487	498	509	523	537	548	563	578
Consumption	490	513	543	572	595	620	642	666	693	716	739
Net Trade	0	-23	-59	-90	-107	-120	-130	-139	-153	-163	-172

Indonesian Biofuels Production and Consumption

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Biodiesel					(Million Gallons)						
Production	105	172	218	249	270	284	293	300	304	307	309
Consumption	3	55	69	83	97	112	128	144	161	179	197
Net Trade	102	117	149	166	173	171	165	155	143	128	112
Use in Biodiesel Production					(Thousand Metric Tons)						
Palm Oil	367	601	760	869	942	992	1,025	1,048	1,063	1,073	1,079

Japanese Biofuels Production and Consumption

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
					(Million Gallons)						
Ethanol											
Net Trade	-149	-196	-234	-273	-308	-343	-377	-412	-447	-481	-516
Biodiesel											
Net Trade	-4	-19	-17	-16	-15	-15	-15	-15	-15	-14	-14

South Korean Biofuels Production and Consumption

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
					(Million Gallons)						
Ethanol											
Net Trade	-81	-104	-132	-154	-175	-195	-215	-236	-257	-276	-297

Malaysian Biofuels Production and Consumption

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
					(Million Gallons)						
Biodiesel											
Net Trade	51	47	48	48	48	48	48	47	47	47	47

Rest of World Biofuels Production and Consumption

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
					(Million Gallons)						
Ethanol											
Net Trade	-67	-104	-140	-176	-212	-247	-282	-317	-353	-388	-423
Biodiesel											
Net Trade	-465	-468	-468	-467	-466	-466	-466	-465	-465	-465	-464