
WORLD BIOFUELS

World Ethanol

The world ethanol price decreased 12.6% in 2007, to \$1.68 per gallon. It is projected to decrease 15.8%, to \$1.41 per gallon, in 2008 because of an increase in ethanol supply, particularly in Brazil. The ethanol price continues its downward trend until 2012, after which it begins to increase because of higher ethanol demand from the U.S. brought about by the 2007 energy act. World net trade declined by 15.1% in 2007; it increases in 2008 by 10.4%. As demand for ethanol increases over the projection period, net trade is expected to rise by 235%, reaching 3.6 billion gallons by 2017.

Brazil's ethanol production totaled 5.2 billion gallons in 2007, an increase of nearly 15.2%. This translates into 225.6 mmt of sugarcane used in ethanol production. Production of ethanol increases 96.7% by the end of the projection period, to 10.3 billion gallons. Sugarcane used in ethanol production increases 79.1%, reaching 404.1 mmt, by 2017. Ethanol consumption increased in 2007 by 15.4%, to 4.3 billion gallons. Ethanol consumption is projected to increase 56.8% by 2017. Net ethanol exports reach 3.6 billion gallons in 2017, an increase of 314.8%, partly because of the increase in U.S. ethanol import demand.

Ethanol production in the EU increased 75.1% in 2006 and decreased 2.2% in 2007 because of higher feedstock prices. Ethanol production is projected to reach 2.1 billion gallons in 2017, an increase of 72%. Consumption increased 9.1% in 2007, to 1.2 billion gallons. Consumption reaches 2.4 billion gallons in 2017, an increase of 93.6% over the decade. Total biofuels consumption reaches 2.4% of transport fuels in 2010, well below the 5.75% target indicated in the 2003 Biofuels Directive. EU net imports rise from 33 million gallons in 2007 to 329 million gallons by 2017 as consumption grows faster than production.

Chinese fuel ethanol production increased less than 1% in 2007, to 428.7 million gallons. It is projected to continue to increase and reach 576.4 million gallons by 2017. The use of corn in ethanol production, which is the primary feedstock, reaches 4.3 mmt in 2017. Ethanol consumption in China increased in 2007 to 214.5 million gallons as China began implementation of alternative fuel sources. Consumption increases 158%, to 553 million gallons, by 2017. China's net exports decline steadily over time, as ethanol consumption outpaces production.

In India, ethanol is produced mainly from molasses, a co-product in sugar production from sugarcane. Ethanol production increased almost 21%, from 492 million gallons in 2006 to 594 million gallons in 2007. Production rises to 748 million gallons in 2017, an increase of 25.9%. Consumption of ethanol was 479 million gallons in 2007 and is projected to increase 98.2%, to 950 million gallons, in 2017. Net imports increase to 214 million gallons in 2017.

World Biodiesel

The world price of biodiesel (Central Europe FOB) increases to \$4.82 per gallon in 2008, driven by high demand as EU countries attempt to achieve their biofuel targets and because of high crude-oil prices. Expanded production in Argentina and Brazil leads to a temporary price decline, to \$4.40, in 2009 and to a sharp increase in exports before the start of the countries' B5 mandates. However, the world price increases to \$6.00 per gallon by 2017, driven by higher demand from the EU. World net trade doubles to 607 million gallons over the next decade, driven mainly by strong EU demand.

Currently, the EU has the world's most developed biodiesel industry. Production increased 15% in 2007, and it reaches 2.5 billion gallons by 2017. Pushed by the biofuel target, domestic consumption continues to grow during the outlook period, reaching 3.0 billion gallons by 2017. The biodiesel share of diesel in transport is, however, still only 4.3%. Net imports increase rapidly between 2007 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 429 million gallons at the end of the decade.

Encouraged by its biodiesel mandate and the world market, Argentina's biodiesel production expands from 73 to 468 million gallons between 2007 and 2017. 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 217 million gallons by 2017. Net exports grow to 225 million gallons in 2009 and then drop by 54% next season because of the mandate. Trade rebounds in 2011 and grows to 251 million gallons by 2017.

Similar to the outlook in Argentina, Brazil's biodiesel production is motivated by its mandate and the international market. Production increases to 718 million gallons by the end of the decade. Consumption jumps in 2008 and 2010 because of the mandate (B5 by 2008 and B10 by 2010). Domestic use is projected to reach 634 million gallons by 2017. Because of the mandate, Brazil's net exports drop by 83% in 2010 and then grow moderately for the remainder of the outlook, supplying 84 million gallons by 2017.

Indonesian production increased from 70 million gallons in 2006 to 101 million gallons in 2007, driven by strong production margins. The growth in the industry is halted because of a rise in palm oil prices. By the end of the period, production remains stagnant, ending at 110 million gallons. At about 7% of production, domestic consumption of biodiesel remains low throughout the period. Net exports capture most of the total production and increase to 340 million gallons over the next 10 years.

Ethanol Trade

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Net Exporters	(Million Gallons)										
Brazil	866	1,006	1,127	1,213	1,370	1,558	1,847	2,231	2,664	3,064	3,591
China	214	118	86	64	40	26	22	24	24	18	23
Total Net Exports *	1,080	1,192	1,265	1,296	1,410	1,584	1,869	2,255	2,687	3,082	3,615
Net Importers	(U.S. Dollars per Gallon)										
Canada	67	85	124	148	170	192	214	236	261	284	306
European Union	33	66	82	107	146	180	210	238	268	301	329
India	0	-68	-52	-19	24	67	103	132	158	186	214
Japan	190	211	224	237	249	261	271	280	290	300	309
South Korea	80	90	96	103	110	116	122	127	132	138	143
United States	407	427	353	351	350	492	725	1,103	1,328	1,728	2,223
ROW	314	326	337	348	359	370	380	390	401	411	422
Total Net Imports *	1,080	1,192	1,265	1,296	1,410	1,584	1,869	2,255	2,687	3,082	3,615
Prices	(U.S. Dollars per Gallon)										
Anhydrous Ethanol Price, Brazil **	1.68	1.41	1.41	1.34	1.27	1.25	1.29	1.35	1.41	1.43	1.52
Ethanol, FOB Omaha	2.04	1.94	1.82	1.77	1.75	1.83	1.99	2.11	2.17	2.02	1.94

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

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Net Exporters	(Million Gallons)										
Argentina	60	153	225	104	143	175	199	218	232	243	251
Brazil	0	67	266	46	64	77	85	89	90	88	84
Indonesia	86	97	99	101	102	102	103	103	102	102	102
Malaysia	36	39	37	38	38	37	37	38	38	38	38
United States	110	200	235	216	177	131	108	104	109	119	127
Total Net Exports *	292	557	862	505	525	522	532	551	572	590	602
Net Importers	(U.S. Dollars per Gallon)										
European Union	119	389	689	333	352	348	358	377	398	416	429
Japan	67	60	66	64	64	65	65	65	64	64	63
ROW	105	108	107	108	109	109	109	109	110	110	111
Total Net Imports *	292	557	862	505	525	522	532	551	572	590	602
Prices	(U.S. Dollars per Gallon)										
Central Europe FOB Price **	3.57	4.82	4.40	4.99	5.10	5.06	5.22	5.38	5.57	5.77	6.00
Biodiesel Plant	3.32	3.51	3.87	4.05	4.42	4.67	4.81	4.91	5.01	5.12	5.25

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

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	(Million Gallons)										
Ethanol											
Production	8,722	11,186	11,601	11,897	11,928	13,008	14,256	15,146	16,084	16,883	17,963
Consumption	9,006	11,480	11,923	12,227	12,273	13,449	14,927	16,209	17,365	18,559	20,124
Net Trade	407	427	353	351	350	492	725	1,103	1,328	1,728	2,223
Biodiesel											
Production	444	588	638	849	973	1,081	1,108	1,104	1,109	1,119	1,127
From Soybean Oil	397	494	539	739	854	954	980	976	981	989	997
From Other Fats and Oils	48	94	99	110	119	127	129	129	129	129	130
Consumption	334	388	403	633	796	950	1,000	1,000	1,000	1,000	1,000
Net Trade	110	200	235	216	177	131	108	104	109	119	127

Argentine Biofuels Production and Consumption

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	(Million Gallons)										
Biodiesel											
Production	73	161	238	293	336	371	400	423	441	456	468
Consumption	13	8	13	189	193	197	201	205	209	213	217
Net Trade	60	153	225	104	143	175	199	218	232	243	251
Use in Biodiesel Production	(Thousand Metric Tons)										
Soybean Oil	256	559	825	1,009	1,153	1,267	1,358	1,429	1,485	1,529	1,562

Brazilian Biofuels Production and Consumption

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	(Million Gallons)										
Ethanol											
Production	5,227	5,820	6,076	6,328	6,684	7,058	7,524	8,095	8,756	9,450	10,279
Consumption	4,266	4,792	4,946	5,114	5,312	5,500	5,677	5,866	6,094	6,387	6,690
Net Trade	866	1,006	1,127	1,213	1,370	1,558	1,847	2,231	2,664	3,064	3,591
Use in Ethanol Production	(Thousand Metric Tons)										
Sugarcane	225,610	246,917	255,593	263,934	276,443	289,473	305,949	326,429	350,088	374,649	404,063
	(Million Gallons)										
Biodiesel											
Production	108	280	482	597	627	651	670	686	699	709	718
Consumption	72	212	216	552	563	574	585	597	609	621	634
Net Trade	0	67	266	46	64	77	85	89	90	88	84
Use in Biodiesel Production	(Thousand Metric Tons)										
Soybean Oil	319	716	1,400	1,717	1,783	1,829	1,862	1,884	1,898	1,904	1,904

Canadian Biofuels Production and Consumption

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
	(Million Gallons)										
Ethanol											
Production	147	246	317	370	409	449	490	532	574	622	671
Consumption	214	332	441	518	580	642	704	769	835	905	977
Net Trade	-67	-85	-124	-148	-170	-192	-214	-236	-261	-284	-306
Use in Ethanol Production	(Thousand Metric Tons)										
Corn	1,054	1,769	2,279	2,655	2,940	3,228	3,523	3,824	4,126	4,465	4,820
Wheat	472	793	1,022	1,190	1,318	1,447	1,579	1,714	1,849	2,001	2,160

Chinese Biofuels Production and Consumption

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Ethanol	(Million Gallons)										
Production	429	421	425	436	445	457	474	497	522	548	576
Consumption	214	303	339	373	405	431	452	473	499	530	553
Net Trade	214	118	86	64	40	26	22	24	24	18	23
Use in Ethanol Production	(Thousand Metric Tons)										
Corn	3,100	3,279	3,250	3,302	3,382	3,456	3,560	3,707	3,892	4,086	4,289

European Union Biofuels Production and Consumption

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Ethanol	(Million Gallons)										
Production	1,217	1,289	1,359	1,423	1,513	1,607	1,704	1,802	1,899	1,993	2,092
Consumption	1,249	1,353	1,440	1,528	1,657	1,785	1,911	2,038	2,164	2,292	2,418
Net Trade	-33	-66	-82	-107	-146	-180	-210	-238	-268	-301	-329
Use in Ethanol Production	(Thousand Metric Tons)										
Wheat	1,369	1,451	1,530	1,602	1,703	1,809	1,918	2,028	2,137	2,244	2,355
Corn	489	518	546	572	608	646	685	724	763	801	841
Barley	1,076	1,140	1,202	1,258	1,338	1,421	1,507	1,594	1,679	1,763	1,850
Biodiesel	(Million Gallons)										
Production	1,775	1,558	1,401	1,836	1,896	1,924	2,066	2,173	2,286	2,396	2,511
Consumption	1,949	1,988	2,131	2,209	2,289	2,313	2,464	2,590	2,724	2,852	2,980
Net Trade	-119	-389	-689	-333	-352	-348	-358	-377	-398	-416	-429
Use in Biodiesel Production	(Thousand Metric Tons)										
Rapeseed Oil	5,252	4,574	4,135	5,439	5,630	5,728	6,156	6,476	6,817	7,147	7,493
Soybean Oil	772	687	574	702	681	646	653	648	641	630	619
Sunflower Oil	59	42	35	55	56	56	62	66	71	76	81

Indian Biofuels Production and Consumption

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Ethanol	(Million Gallons)										
Production	594	623	642	653	659	667	680	696	714	729	748
Consumption	479	539	584	632	682	729	773	817	862	907	950
Net Trade	0	68	52	19	-24	-67	-103	-132	-158	-186	-214

Indonesian Biofuels Production and Consumption

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Biodiesel	(Million Gallons)										
Production	101	105	107	109	110	110	110	110	110	110	110
Consumption	15	7	8	8	8	8	8	8	8	8	8
Net Trade	86	97	99	101	102	102	103	103	102	102	102
Use in Biodiesel Production	(Thousand Metric Tons)										
Palm Oil	354	366	373	380	384	385	386	386	386	385	385