

USDA Foreign Agricultural Service

GAIN Report

Global Agricultural Information Network

THIS REPORT CONTAINS ASSESSMENTS OF COMMODITY AND TRADE ISSUES MADE BY USDA STAFF AND NOT NECESSARILY STATEMENTS OF OFFICIAL U.S. GOVERNMENT POLICY

Required Report - public distribution

Date: 9/3/2015

GAIN Report Number: CH15030

China - Peoples Republic of

Biofuels Annual 2015

China Biofuel Industry Faces Uncertain Future

Post:

Beijing

Approved By:

David Cottrell

Prepared By:

Andrew Anderson-
Sprecher and James Ji

Report Highlights:

China is a major producer of biofuels and production continues to increase. However, it is unclear how the government will meet its ambitious targets for continued expansion given its decision to limit grain-based biofuel production and the limited availability of alternative feedstocks. 2016 fuel ethanol production is forecast at 3.15 billion liters (2.49 million metric tons), up 2.6 percent from 2015 in response to increased fuel consumption in provinces with blend mandates. Biodiesel production is forecast to stay flat in 2016 at 1.14 billion liters (1 million metric tons). 2016 ethanol imports are forecast to reach 90 million liters on higher consumption and competitive prices. Imports jumped to 56.9 million liters in the first half of 2015, compared to less than 14 million liters during the same period the year before. The prospect for further import growth remains uncertain given tight government controls over the sale of ethanol for fuel use.

Executive Summary:

Bioenergy is part of China's long run strategic energy plan. The 12th Five Year plan, which ends this year, set a goal of producing four million tons of fuel ethanol and one million tons of biodiesel by 2015. The government reached its goal for biodiesel, but fuel ethanol production in 2015 is only expected to reach 2.43 million tons. China's 2016 fuel ethanol production is forecast at 3.15 billion liters (2.49 million metric tons), up 2.6 percent from 2015 in response to increased fuel consumption in provinces with blend mandates, but still far short of the 2015 target. The government began to withdraw policy support for grain-based ethanol in 2010 following increasing domestic grain prices and imports triggered alarm within government. All subsidies for grain-based ethanol have now been removed and production volumes are tightly controlled.

2016 ethanol imports are forecast to reach 90 million liters on higher consumption and competitive prices. 2015 ethanol imports are forecast at 70 million liters, up from only 14 million liters in 2014, based on import trends. China imported 56.9 million liters of ethanol in the first six months of 2015 alone. Imports of denatured ethanol are only allowed to be used in the chemical processing sector. The government tightly controls fuel distribution and only designated ethanol producers and distributors to sell fuel ethanol for use in transportation.

Biodiesel production is forecast to stay flat in 2015 and 2016 at 1.14 billion liters (1 million metric tons). Biodiesel production almost doubled between 2010 and 2015 due in part to a government crackdown on the illegal use of recycled cooking oil for human consumption. However, a lack of sales channels, feedstock, and government support has restricted growth. Many biodiesel producers are closing plants or exiting production completely. The state-owned oil company CNOOC decided to halt its biodiesel pilot project in Hainan province and the Gushan Group also retreated from the biodiesel market in China after experiencing several years of heavy financial losses.

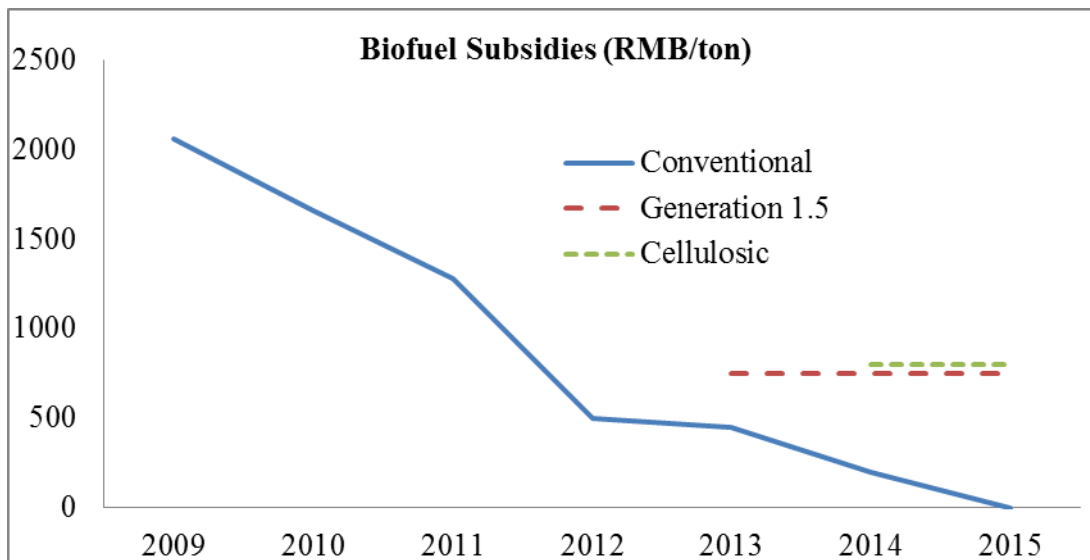
While the 13th Five Year Plan (2016-2020) is still in the early planning stage, the biofuel industry and some officials are already discussing new objectives for increasing biomass and biofuel production, including how to promote cellulosic and algae based biofuels. The government has set an ambitious target of producing 300 million tons of cellulosic and non-grain based ethanol combined by 2020, although industry experts doubt that this can be achieved due to challenges in collecting and transporting feedstock from China's small-scale farms and the lack of commercially viable cellulosic ethanol production to date.

II. Policy and Programs

China implemented a fuel ethanol programs starting in the early 2000's in response to abundant grain supplies. The government switched course in 2010 when increasing domestic grain prices triggered concerns over possible shortages and caused China to become a net corn importer. Since then government policy has dictated that biofuel development not compete with crops intended for human or animal consumption. Government subsidy policies have also switched to only supporting non-grain based biofuels.

At the same time, China has built up enormous of reserves of corn, wheat, and rice that combined exceeds 200 million tons. Industry estimates that 15 to 20 million tons of these reserves are sufficiently moldy so that they are no longer suitable for human consumption or feed use. The biofuel industry and some provincial officials are lobbying the government to subsidize the use of moldy grain for biofuel production. However, China Ministry of Finance is reportedly reluctant to increase expenditures on subsidies.

Restrictions on grain-based ethanol and challenges in producing commercially viable cellulosic biofuels have resulted in a policy of supporting so called "Generation 1.5" biofuels, which are produced by non-grain based feedstocks such sweet sorghum and cassava. Some of these crops can be grown on marginal land and require fewer inputs, but supply is insufficient to support large-scale industrial ethanol production. The government introduced a 750 RMB per ton subsidy for Generation 1.5 ethanol production in 2013. Cellulosic ethanol production receives a slightly higher subsidy of 800 RMB per ton. Direct subsidies for conventional grain-based biofuels have now been completely phased out (see below).



Source: Innovation Center for Energy and Transportation Beijing

Bioenergy is part of China's long run strategic energy plan. The 12th Five Year plan, which ends this year, set a goal of producing four million tons of fuel ethanol and one million tons of biodiesel by 2015. China met the government goal for biodiesel, but fuel ethanol production in 2015 is only expected to reach 2.43 million tons. While the 13th Five Year Plan (2016-2020) is still in the early planning stage, the biofuel industry and some officials are already discussing new objectives for increasing biomass and biofuel production, including how to promote cellulosic and algae based biofuels.

12th Five Year Plan Target from 2010 to 2015

Biomass Electricity	Biomass Gas Annual Utilization	Solid Biomass for Fuel Annual Utilization	Liquid Biofuels Annual Utilization
13 million kilowatts capacity	30 billion cubic meters	10 million tons	4 million tons of fuel ethanol and 1 million tons of biodiesel

In late 2014, the Chinese government approved a National Climate Change Plan (NCCP) that set out emission and clean energy targets for 2020. This plan is widely recognized and could potentially serve as a blueprint for biofuel objectives in the 13th Five Year Plan. The NCCP set a target of 130 billion cubic meters of biofuel production by 2020 (see below). The 2020 biofuel targets are massively higher than current production levels, and it is unclear how the government intends to reach these targets.

National Climate Change Plan (NCCP) 2015 to 2020

Biomass Electricity	Biomass Gas Annual Utilization	Solid Biomass for Fuel Annual Utilization	Liquid Biofuels Annual Utilization
30 million kilowatts capacity	44 billion cubic meters	50 million tons	130 billion cubic meters (No specifics on composition)

Ethanol

China is the third largest ethanol producer after the United States and Brazil. Six provinces (Heilongjiang, Jilin, Liaoning, Henan, Anhui, and Guangxi) have adopted an E10 blend mandate. The actual blend rate in these markets varies from 7-13 percent according to industry sources. By regulation, each of the 7 fuel ethanol plants has a designated distribution market in one or several provinces. As of 2015, the mandated blend program fully covers six provinces and covers another 27 cities in five other provinces. Regulations require state petroleum companies in these provinces to purchase and blend set amounts of fuel ethanol from designated plants. The price of ethanol is fixed by the government at 91.1 percent of the #93 gasoline ex-factory variable price.

On the next page is a rough map of blend mandates and ethanol facilities in China. Provinces in green have province wide E10 mandates. Provinces in yellow contain approximately 30 pilot cities with E10 gas mandates. Red dots mark licensed fuel ethanol facilities. The average blending ratio for ethanol gasoline is about 2.1 percent in China as a whole. There are no plans to increase blend rates beyond E10, so future ethanol consumption growth will depend on growth in gasoline consumption or implementing E10 standards in additional provinces. If no significant policy change, both factors will gradually drive ethanol consumption higher.

Licensed Ethanol Manufacturers

Gasoline Total	145,008	153,040	161,508	170,448	179,886	189,849	193,843	197,921	202,085	206,336	210,677
Diesel Total	207,914	211,014	214,173	217,380	220,637	224,832	227,361	229,921	232,513	235,136	237,791
On-road	150,246	159,261	165,281	171,528	178,012	184,741	190,745	196,944	203,345	209,954	216,777
Agriculture											
Construction/mining											
Shipping/rail											
Industry											
Heating											
Jet Fuel Total											
Total Fuel Markets	352,923	364,053	375,681	387,828	400,522	414,681	421,204	427,842	434,597	441,471	448,468

China Gasoline Use Projection (Million Liters)											
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Gasoline	141,930	149,885	158,292	167,170	176,544	186,444	190,347	194,332	198,400	202,553	206,794
Fuel Ethanol equivalent	3,078	3,155	3,216	3,278	3,341	3,406	3,496	3,589	3,685	3,783	3,883
Total Gasoline	145,008	153,040	161,508	170,448	179,886	189,849	193,843	197,921	202,085	206,336	210,677

China Diesel Use Projection (Million Liters)											
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Diesel	206,623	209,723	212,868	216,061	219,302	222,592	225,040	227,516	230,018	232,549	235,107
Bio Diesel equivalent	1,291	1,291	1,305	1,319	1,335	1,352	1,379	1,408	1,437	1,466	1,496
HVO equivalent	0	0	0	0	0	888	941	998	1,058	1,121	1,188
Total Diesel	207,914	211,014	214,173	217,380	220,637	224,832	227,361	229,921	232,513	235,136	237,791

Notes:

- Total 2016 gasoline and diesel use is estimated by Post. There are no available official estimates.
- The conversion rate for gasoline is 1,388 liters per ton; the conversion rate for diesel is 1,176 liters per ton. These are the rates used by China's Customs and Taxation Bureau.
- The conversion rate used for ethanol is 1,267 liters per ton; the conversion rate for biodiesel is 1,136 liters per ton.
- The annual growth rate for gasoline between 2015 and 2020 is estimated at 5.66 percent while the growth rate for gasoline between 2020 and 2025 is estimated at 2.1 percent.
- The annual growth rate for diesel between 2015 and 2020 is estimated at 1.5 percent annually while the growth rate for gasoline between 2020 and 2025 is estimated at 1.1 percent.
- Projections are based on projected GDP growth trends and increasing energy efficiency.

Vehicle and Fuel Use

The number of civilian vehicles in China reached 145 million units in 2014, up 12.4 percent year-on-year, according to China National Statistical Yearbook data. Passenger vehicles in 2014 reached 123

million units, up 15.5 percent year-on-year. On average, China added 11 million civilian vehicles annually for the past 10 years. There are 31 cities that have over one million passenger vehicles and nine cities have over three million passenger vehicles.

Vehicle sales growth has slowed as China's economy has decelerated. The Association of Automobile Manufacturers forecasts that vehicle sales in 2015 will grow by seven percent in 2015, down from 12.4 percent growth in 2014 and 16.6 percent growth in 2013. Q1 2015 car production and sales were 8.28 million and 1.99 million respectively. Production increased 4.1 percent year over year, the lowest growth rate in the past 2 years, and Q1 sales only increased 2.8 percent. Sales of utility vehicles and buses fell sharply, contracting by 18 percent and 19 percent year over year, respectively.

Replacing potential demand for ethanol, the government encourages the purchase of electric vehicles and other "new energy" vehicles to reduce fossil fuel use and improve air quality. In July, 2014 the State Council eliminated the purchase tax for new energy vehicles. New energy vehicles were required to account for 15 percent of government vehicle purchases in 2014 in Beijing, Tianjin, Hebei, Yangtze River Delta (Shanghai region) and Pearl River Delta (Guangzhou region) as part of a campaign to tackle heavy air pollution in these regions. For all other government agencies and institutions, new energy vehicles were required to account for at least 10 percent of new vehicle purchases in 2014. These requirements increase to 20 and 30 percent, respectively, for 2015 and 2016.

Total diesel consumption in 2015 is estimated at 207.6 billion liters, while gasoline consumption is estimated at 145 billion liters. Post forecasts that gasoline consumption will expand by 5.6 percent for the next five years due to slower but still robust passenger vehicle sales growth. Diesel consumption is forecast to expand more slowly at 1.5 percent during this period. There are no official growth projections for fuel use.

III. Ethanol

Fuel Production

China's 2016 fuel ethanol production is forecast at 3.15 billion liters, up 2.6 percent from 2015 in response to increased fuel consumption in provinces with blend mandates. 2015 fuel ethanol production is estimated at 3.08 billion liters (). The mandated blend rate in designated provinces is 10 percent; in practice the blend rate for ethanol in gasoline in these markets is between 7 and 13 percent.

The 11th Five-Year Plan (2006-2010) set goals for expanding non-grain based ethanol production, targeting cassava and sweet sorghum based production. The world's first cassava ethanol plant was built in Guangxi in 2007 with an original annual production capacity of 200,000 tons. A sweet sorghum ethanol plant (50,000 tons capacity) was completed in Inner Mongolia in 2012 by ZTE. China has seven licensed industrial scale fuel ethanol plants, using corn, wheat, cassava, and sweet sorghum and corn cobs.

Total Production

Total ethanol production (potable beverage, fuel, and other industrial chemicals) is estimated at 18 billion liters in 2015. Official ethanol statistics are not broken out into beverage and industrial production, making it difficult to determine the exact mix. Based on available information, post

estimates that beverages and hard liquor will account for 56 percent of total ethanol production in 2015, or roughly 10.22 billion liters. Industrial chemicals are estimated to account for 26 percent of total production (4.69 billion liters), while fuel ethanol is estimated to make up 18 percent of production (3.08 billion liters).

There are a reported total of 160 ethanol plants nationwide using a variety of feedstocks such as grains (corn and wheat), tubers (cassava and sweet potatoes), and molasses. Corn and cassava are the main feedstocks, and currently account for 70 percent and 25 percent of production respectively. Molasses (from cane or beet sugar plants) accounts for the remaining five percent.

Ethanol End Use Estimates (Million Liter)											
Ethanol Prediction by End Use	2,006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Ethanol, Total	8,003	8,668	9,361	10,127	11,207	12,477	14,266	15,605	16,763	17,995	18,982
Fuel Ethanol	1,664	1,731	2,257	2,466	2,479	2,566	2,858	2,934	2,951	3,078	3,155
<i>Ethanol – Conventional + Gen 1.5</i>	1,653	1,713	2,235	2,397	2,383	2,479	2,724	2,735	2,721	2,835	2,906
<i>Ethanol – Cellulosic</i>	11	17	23	68	96	87	134	199	230	243	249
Ethanol, Other Industrial Chemicals	979	1,077	1,185	1,253	1,656	2,053	2,428	2,861	3,970	4,692	5,036
Ethanol, Beverage and Other usage	5,359	5,860	5,918	6,409	7,072	7,858	8,980	9,810	9,842	10,224	10,791

Trade

Imported ethanol is far cheaper than domestically produced ethanol due to high domestic corn prices. Imports have grown rapidly in recent years, although they remain small as a share of total consumption. In June, 2015 the price for domestic ethanol was RMB 5,541 per ton (\$892), whereas the average CIF price for imported ethanol was around \$570. Some market participants have interpreted growing imports as a sign of greater government acceptance of imports, although there have been no changes in regulations or official statements to this effect.

The tariff for denatured ethanol (HS: 220720) is five percent for 2015. This tariff has been lowered in recent years (it was 30 percent in 2009) to encourage additional imports of by-products and raw materials. Imports of denatured ethanol are only allowed to be used in the chemical processing sector. The government tightly controls fuel distribution and only designated ethanol producers and distributors are allowed to sell fuel ethanol for use in transportation. Designated distributors and producers do not appear to be explicitly prohibited from importing ethanol. However, sources note that registered distributors are cautious about importing significant quantities of ethanol without explicit government approval for fear of getting crosswise with government policy.

The import tariff for undenatured ethanol remains at 40 percent. A 17 percent value added tax and a consumption tax of five percent are applied to imports of both denatured and undenatured ethanol. In 2012 China eliminated import tariffs for ethanol (undenatured and denatured) from ten ASEAN countries, plus Chile, Singapore, Vietnam and Pakistan due to free trade agreements.

China imported 56.86 million liters of ethanol in the first half of 2015. The largest supplier by far was Pakistan, which supplied 42.93 million liters of ethanol to China during this period. The next two largest suppliers were Vietnam and the United States at 8.62 and 5.14 million liters respectively. Some of the import statistics include blends, so the pure ethanol content of imports is estimated lower. In addition, import duties are lower for fuel ethanol than for alcohol for human or industrial consumption; there are

reports of some imported alcohol incorrectly being reported as fuel.

According to trade contacts, the fuel ethanol imported in 2014 was part of a trial to study the economics and trading channels for ethanol. The trial proved that imports are feasible and economically viable and the trial period for fuel ethanol has been extended to 2015. However, the government has been reluctant to change energy policy and regulations on biofuels despite the need for imported fuel and pressing air pollution challenges. Besides its policy of discouraging greater use of grain-based ethanol, the government is also worried that imports will hurt existing ethanol producers who have struggled due to high corn prices and weak demand. Government officials also cited concerns over possible price and supply volatility as a reason not to utilize imported ethanol.

Tax and tariffs on ethanol

Tariff and Taxes on Ethanol Trade									
HS#		Import Rate	Tariff	VAT on Import	Consumption Tax	Import	VAT	Rebate	on
220710	Undenatured	40%		17%	5%				0%
220720	Denatured	5% *		17%	5%				0%

Source: Ministry of Finance

Ethanol Used as Fuel and Other Industrial Chemicals (Million Liters)											
Calendar Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Beginning Stocks	0	0	0	0	0	0	0	0	0	0	0
Fuel Begin Stocks		0	0	0	0	0	0	0	0	13	82
Production	2,643	2,808	3,442	3,718	4,135	4,619	5,286	5,795	6,921	7,771	8,191
Fuel Production	1,664	1,731	2,257	2,466	2,479	2,566	2,858	2,934	2,951	3,078	3,155
Imports	8	1	0	0	4	5	15	0	14	70	90
Fuel Imports	2	1	0	0	3	5	3	0	14	70	90
Exports	1,018	130	108	108	156	43	45	40	33	33	30
Fuel Exports	47	19	8	16	12	8	7	2	1	1	1
Consumption	1,633	2,679	3,334	3,610	3,983	4,581	5,256	5,755	6,902	7,808	8,251
Fuel Consumption	1,619	1,713	2,249	2,450	2,470	2,563	2,854	2,932	2,951	3,078	3,155
Ending Stocks	0	0	0	0	0	0	0	0	0	0	0
Fuel Ending Stocks	0	0	0	0	0	0	0	0	13	82	171
Production Capacity, Fuel Ethanol (Million Liters)											
Number of Refineries	4	4	4	5	5	5	6	6	7	7	7
Nameplate Capacity	1,824	1,824	2,300	2,500	2,500	2,600	3,000	3,000	3,200	3,200	3,200
Capacity Use	91%	95%	98%	99%	99%	99%	95%	98%	92%	96%	99%

Co-product Production, Fuel Ethanol (1,000 METRIC TONS)											
DDGS	1,0 12	1,0 60	1,1 30	1,1 32	1,1 40	1,1 40	1,1 41	1,1 16	1,0 61	1,0 59	1,1 07
CORN OIL	51	55	65	65	66	69	65	67	64	63	67
WHEAT GLUTEN	45	45	45	45	45	45	45	45	45	45	45
Bagasse (Sweet Sorghum)									13	51	63
Feedstock Use, Fuel Ethanol (1,000 METRIC TONS)											
CORN KERNEL	3,2 33	3,3 85	3,6 08	3,6 14	3,6 41	3,6 41	3,6 45	3,5 63	3,3 89	3,3 81	3,5 70
WHEAT KERNEL	1,0 50	1,0 50	1,0 50	1,0 50	1,0 50	1,0 50	1,0 50	1,0 50	1,0 50	1,0 50	45
CASSAVA (Dried Chips)			36 4	46 7	39 2	336	336	392	504	504	520
CORN COB								240	250	260	270
SWEET SORGHUM (Fresh whole stalk)									90	360	450
Market Penetration, Fuel Ethanol (Million Liters)											
Fuel Ethanol	1,6 19	1,7 13	2,2 49	2,4 50	2,4 70	2,5 63	2,8 54	2,9 32	2,9 51	3,0 78	3,1 55
Gasoline	72, 76 6	76, 60 5	85, 30 0	85, 67 7	95, 57 8	102, 65 6	112, 99 6	119, 77 5	126, 96 2	145, 00 8	153, 04 0
Blend Rate	2.2 %	2.2 %	2.6 %	2.9 %	2.6 %	2.5 %	2.5 %	2.4 %	2.3 %	2.1 %	2.1 %

Note

- The corn and wheat to ethanol conversion ratio is 3.3 to 1; the cassava (dried) to ethanol conversion ratio is 2.87 to 1.
- Categories for production, by-products, and feedstock use refer to the 7 fuel ethanol plants.
- For the plant that uses corn cobs for cellulosic ethanol, the conversion rate for corn cob (14 percent moisture level) to ethanol is 7.5 to 1.
- For the sweet sorghum plant that started operation in June 2014, the conversion rate for sweet sorghum (fresh stalks) to ethanol is 18 to 1. This is the first such plant in China.

China Ethanol Imports										
Partner Country	Unit in 1,000 L	Quantity								2015 Q1,Q2
		2008	2009	2010	2011	2012	2013	2014		
World		402	159	3,611	5,305	15,308	275	26,717	56,866	
Japan		131	109	153	184	229	142	184	44	

United States		13	25	44	30	31	32	26,310	5,145
Pakistan		194	0	0	1,973	7,854	18	59	42,938
Indonesia		0	0	3,004	2,943	0	0	0	0
Vietnam		0	0	0	0	4,995	0	0	8,624
Thailand		0	0	0	24	2,066	0	0	0
Others		64	25	411	151	133	83	164	115

Source: GTIS World Trade Atlas

China Ethanol Exports								
Partner Country	Unit in 1,000 L							
		2009	2010	2011	2012	2013	2014	2015 Q1,Q2
World		107,895	156,019	43,333	44,962	39,776	32,757	16,449
Korea North		3,282	7,547	9,848	27,187	20,915	13,606	4,410
Taiwan		13,708	21,312	13,778	7,365	8,027	6,125	2,018
Japan		11,362	14,743	15,276	8,529	5,101	6,834	2,480
Philippines		6,288	19,064	2,394	0	3,649	2,067	6,132
India		885	906	872	964	984	1088	571
Korea South		58,534	85,460	0	0	41	1276	0
Australia		3,705	3,699	16	16	20	4	4
Singapore		6,747	2,406	170	32	2	0	0
Others		3,387	883	979	868	1,036	1,757	834

Source: GTIS World Trade Atlas

IV. Biodiesel

Biodiesel production is estimated at 1.14 billion liters (in 2015, mostly unchanged from the year before. Production is forecast to stay flat in 2016. Nearly all biodiesel in China is made from waste cooking oil. Biodiesel production almost doubled between 2010 and 2015 due in part to a government crackdown on the illegal use of recycled cooking oil for human consumption. The crackdown helped lower the cost and increase the supply of this feedstock.

Biodiesel production capacity is estimated at 4.25 billion liters, a 6 percent increase from the previous year. The capacity utilization rate for the sector is estimated at only 27 percent due to the lack of large scale collection channels for waste cooking oil. There are currently 54 biodiesel plants, but more than half of the producers have ceased production. After five years of net losses, the state-owned oil company CNOOC decided to halt its biodiesel pilot project in Hainan province. The NYSE listed Gushan Group also retreated from the biodiesel market in China after experiencing several years of heavy financial losses.

Two key challenges biodiesel producers face in China are competition for waste oil and restricted sales channels. While the government has sought to crackdown on misuse of waste cooking oil (also known as “gutter oil”), illegal food use remains a problem due to very high profit margins of around 150 to 240 percent. This creates heavy competition for this waste stream product, making it more difficult for biodiesel facilities to obtain feedstock at an affordable price.

In addition, state owned oil companies block biodiesel from being sold to most consumers. China National Petroleum (CNPC) and SinoPec, which control over 90 percent of gas stations in China, do not sell biodiesel. This forces biodiesel producers to sell to oil brokers or sell directly to end-users. As a result, most biodiesel for road transportation is sold at private gas stations in small cities or in the countryside. About 30% of biodiesel production is used in the on-road transport sector.. An additional 50 percent is used in the industrial sector, and 20 percent is used for agricultural machinery and fishing boats.

Overall diesel use in the transportation sector is estimated at 150 billion liters for 2015, up six percent from the previous year. Diesel for transportation accounts for 71 percent of total diesel use. Total diesel total use for all sectors is estimated to have fallen two percent in 2015 due to lower diesel use for utility vehicles. Biodiesel production only accounts for 0.2 percent of total on-road diesel use. The government is unlikely to set any mandates for biodiesel use in transport fuel in the near future given the limited scale of biodiesel production at this time.

Biodiesel (Million Liters)											
Calendar Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Beginning Stocks	0	0	0	0	0	0	0	0	0	0	0
Production	273	352	534	591	568	738	909	1,079	1,133	1,141	1,141
Imports	0	0	0	0	0	0	20	50	100	150	150
Exports	0	0	0	0	0	0	0	0	0	0	0
Consumption	273	352	534	591	568	738	929	1,129	1,233	1,291	1,291
Ending Stocks	0	0	0	0	0	0	0	0	0	0	0
Production Capacity											
Number of Bio refineries	65	96	84	62	45	49	52	53	53	54	54
Nameplate Capacity	1,761	3,124	3,351	2,670	2,556	3,400	3,600	4,000	4,000	4,250	4,250
Capacity Use	15.5%	11.3%	15.9%	22.1%	22.2%	21.7%	25.3%	27.0%	28.3%	26.8%	26.8%
Feedstock Use (1,000 METRIC TONS)											
Used Cooking Oil	267	344	522	578	556	722	889	1,055	1,108	1,164	1,164
Market Penetration (Million Liters)											
Biodiesel, on-road use	82	106	160	177	170	221	273	324	340	357	373
Diesel, on-road use	76,996	84,489	89,956	92,810	100,179	111,546	126,150	133,718	141,742	150,246	159,261
Blend Rate	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%	0.2%
Diesel, total use	139,193	146,932	159,136	161,771	172,096	183,868	199,520	211,491	211,976	207,914	211,014

Notes:

- The conversion rate for used cooking oil to biodiesel is 1 to 0.9 with current China bio diesel technology capacity. Most of the feedstock in China is collected and processed from gutter oil.
- The blend rate for biodiesel can reach as high as 20 percent. The relative higher the blending rate, the higher the profit for gas stations. The maximum mix rate is 30%. Hainan’s trial program has a blending rate of only 2-5 percent.
- Import/export measurement based on B100 standard

Tariff and Taxes on Biodiesel Trade				
HS#		Import Tariff Rate	VAT on Import	VAT Rebate on Export
382600	Biodiesel and mixtures	6.5%	17%	0%
For biodiesel from ASEAN countries, the Tariff rate is zero since 2012				

Source: Ministry of Finance

Biodiesel imports are estimated at 150 million liters in 2015, up 50 percent from the year before due to large purchases of Indonesian biodiesel by a Chinese state owned petro company. Imports of biodiesel and mixtures thereof (HTS 3826) surged in 2013 and 2014 due to the elimination of a 0.8 RMB per liter consumption tax on biodiesel imports starting in 2013 (see table below). Imports of petroleum oil containing up to 30 percent biodiesel (HS code 2710.20) also surged in 2013 as a result of the elimination of the consumption tax for biodiesel, with imports jumping from 101,000 liters in 2012 to 2.5 million liters in 2013. Trade contacts reported that most imports under this tariff line had very low biodiesel content (around 1-2 percent) and that this was added in order to avoid consumption taxes. The government cracked down on this practice in 2014, and imports under this tariff line have fallen rapidly as a result. As many of the tariff lines include blends, the estimated total volume of pure (b100) biodiesel is estimated at far lower than the sum of the tariff lines below.

China Biodiesel Imports in Million liters Liters (HS code: 3826)	2012	2013	2014
World	17	140	864
Indonesia	17	138	786
Other countries	0	2	78

Commodity: 2710.20, Petroleum Oils and Preparations Containing Biodiesel Imports in Million liters	2012	2013	2014
World	101	2,529	156
Indonesia	71	327	33
Singapore	30	206	0
Malaysia	0	1,242	123
Thailand	0	754	0

V. Advanced Biofuels

The government has set an ambitious target of producing 300 million tons of cellulosic and non-grain based ethanol combined by 2020. However, challenges in collecting and transporting feedstock from China's small-scale farms combined with slow progressed cellulosic technology hinder Industrial process of cellulosic ethanol. Industry experts predict China could produce 10 million tons of cellulosic ethanol by the target date.

State-owned enterprises dominate the cellulosic ethanol market due to their strong access to capital and government support. Private companies are not eligible to receive government incentives or subsidies. Therefore, it is almost impossible for private company to enter this market. The state-owned enterprises currently engaged in cellulosic ethanol are China National Cereals, Oils and Food Corporation (COFCO Group), China National Petroleum Corporation (CNPC) , China Petrochemical Limited (Sinopec) and China National Offshore Oil Corporation (CNOOC).