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China - Peoples Republic of

Biofuels Annual

Growing Interest for Ethanol Brightens Prospects

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Report Highlights:

Total ethanol production for 2018 is forecast to grow on strong demand and policy support. With greater production and the current high tariff, imports are forecast at near zero. Supply and use for biodiesel remain small. There is no blending mandate nationwide, only at the provincial level at varying degrees. Note: On September 13, 2017, the Chinese state media reported on the implementation plan concerning the Expansion of Ethanol Production and Promotion for transportation fuel, jointly announced by the National Development and Reform Commission (NDRC), the National Energy Administration (NEA), the Ministry of Finance, and 12 other Ministries. The plan calls for China to achieve nationwide use of 10 percent ethanol (E10) by 2020. By 2025, China will shift renewable fuel production to commercial scale cellulosic ethanol. If realized, this plan, taken with China's ongoing corn sector reform, will fundamentally transform the coarse grains, distillers' dried grains, and ethanol markets in China.

Post:
Beijing

Executive Summary:

Biofuels are part of China's long-run strategic energy plan to help protect the environment, prevent energy shortages, and reduce dependence on imported energy. Blending biofuels into petroleum fuels will support government initiatives to manage air pollution at the national level.

With ambitious emissions targets and policies, China's biofuels policy is expanding in scope beyond transportation fuel and now includes increasing focus on bio-based power generation projects. Today, there is significant interest in expanding the use of crop residues for biomass and biogas power generation, as well as cellulosic ethanol production of transportation fuel.

China has ambitious goals to improve air quality, lower emissions, and improve the economic livelihoods for rural residents. In 2006, China elevated Energy Efficiency and Pollution Abatement as a National Policy, positioning it on par with other key pillars of Chinese domestic policy. The recently issued Expansion of Ethanol Production and Promotion for transportation fuel calls for China to achieve nationwide use of 10 percent ethanol (E10) by 2020. By 2025, China will shift renewable fuel production to cellulosic ethanol. The China Petroleum and Chemical Industry Federation remains skeptical that ethanol will significantly impact the transportation fuels outlook.

Ethanol:

2018 fuel ethanol production is forecast up at 3,950 million liters on strong demand and continued provincial government support. The China Association of Automobile Manufacturers forecasts that overall 2017 vehicle sales will grow to 29.7 million vehicles, up 5 percent from 2016.

Fuel ethanol imports are forecast down to 5 million liters as growing domestic production replaces imports. The current high import duty will also discourage imports. Post's forecast assumes that the current import duty of 30 percent will remain in place. Effective January 2017, ethanol from the United States is assessed a 30 percent duty, up from the previous duty of 5 percent. Ethanol imports are highly regulated. With designated importers licensed to import, distribute, and operate retail fuel stations. Ethanol exports are forecast at 150 million liters due to the favorable VAT rebate.

Fuel ethanol consumption is forecast at 3,945 million liters, up modestly from the 2017 estimate, the blend rate is expected to be 2.3 percent, slightly higher than the 2017 level. With low gasoline prices and no nationwide mandate, presently there is little incentive to blend ethanol.

Biodiesel:

The biodiesel industry remains in its early stages of development in China. 2018 production is forecast at 500 million liters, same as a year ago with limited government support and stagnant capital investment. While imports are expected to remain small, exports are projected to grow. Consumption is expected to be small.

Advanced Biofuel:

Advanced biofuels are made from lignocellulosic biomass or woody crops, agricultural residues or waste, which makes it harder to extract the required fuel. 2018 advanced biofuels production is forecast to reach billion liters, up from a year ago on expanded production capacity.

I. Policy and Programs

For more details, please see GAIN reports [CH13040](#), [CH14038](#), [CH15030](#) and [CH16058](#)

Environmental Commitments

The 13th Five-Year Plan (FYP) for economic and social development for 2016-2020, unveiled in November 2015, primarily focuses on goals for a cap on energy consumption, environmental protection, renewable energy, and biomass energy. To meet these goals, the State Council released “The Energy Development Strategy Action Plan 2016-2020” which aims to cap energy consumption by 2020. Targets include a cap on annual primary energy consumption at 4.8 billion tons of standard coal-equivalent, and a goal of reaching 15 percent of non-fossil fuel-based energy usage in the country’s primary energy mix by 2020.

On October 28, 2016, the National Energy Administration in its 13th FYP for Biomass Energy announced the goal to produce about 5,072 million liters (4.0 million tons) of ethanol and about 2,272 million liters (2.0 million tons) of biodiesel by 2020. While the goal quadruples biodiesel production from the current level, underlying economic fundamentals discourage large-scale efforts to expand production. Thus, it is unlikely to achieve the goal. In addition, the September 13, 2017 issued Expansion of Ethanol Production and Promotion for transportation fuel calls for China to achieve nationwide use of 10 percent ethanol (E10) by 2020. This is an ambitious goal as China’s transportation fuel ethanol production is currently estimated at less than one-third of the 2020 target. Even if the existing capacity is fully utilized, the additional operation would only boost the national ethanol production by about 30-35 percent, well short of meeting the E10 blend target. For ethanol, investments to build new facilities or expand existing capacity have boosted production. It is yet to be seen if the goal can be achieved.

In the November 2016 Paris Agreement on Climate Change, China committed to peak its total greenhouse gas emissions from heavy trucks and passenger vehicles by 2030. Then China is committed to reduce carbon dioxide emissions per unit of GDP by 60 to 65 percent in comparison to emissions benchmarks established in 2005.

On May 10, 2017, China’s Ministry of Science and Technology announced the 13th FYP for Biological Innovation. The plan focuses on promoting innovation in biological-based technologies, including new energy sources using bio-based feedstocks.

Cap and Trade

The 13th Five Year Plan for Greenhouse Gas (GHG) Control and Power Sector Development (2016-2020) was released on November 7, 2016. According to the Economic Information Daily, China is expected to launch its national emissions trading system (ETS) in November 2017, creating the world’s largest carbon market. The ETS will consolidate seven pilot regional carbon trading markets established since 2013 in Beijing, Tianjin, Shanghai, Guangdong, Shenzhen, Hubei and Chongqing, and include

ethanol producers, power generation facilities, as well as steel, cement, and other heavy industries.

In May 2017, allocations for the power sector and other industrial sectors were released at a National Carbon Market training workshop. The working group announced 11 benchmarks for the power industry based on pressure, unit capacity, and fuel type. Observers expect that the national carbon market will start with the power, cement, and electrolytic aluminum producers. Under the emissions trading system, the renewable energy sector will earn additional revenue by selling carbon credits to other sectors that emit more than their quota allows.

Blending Mandate

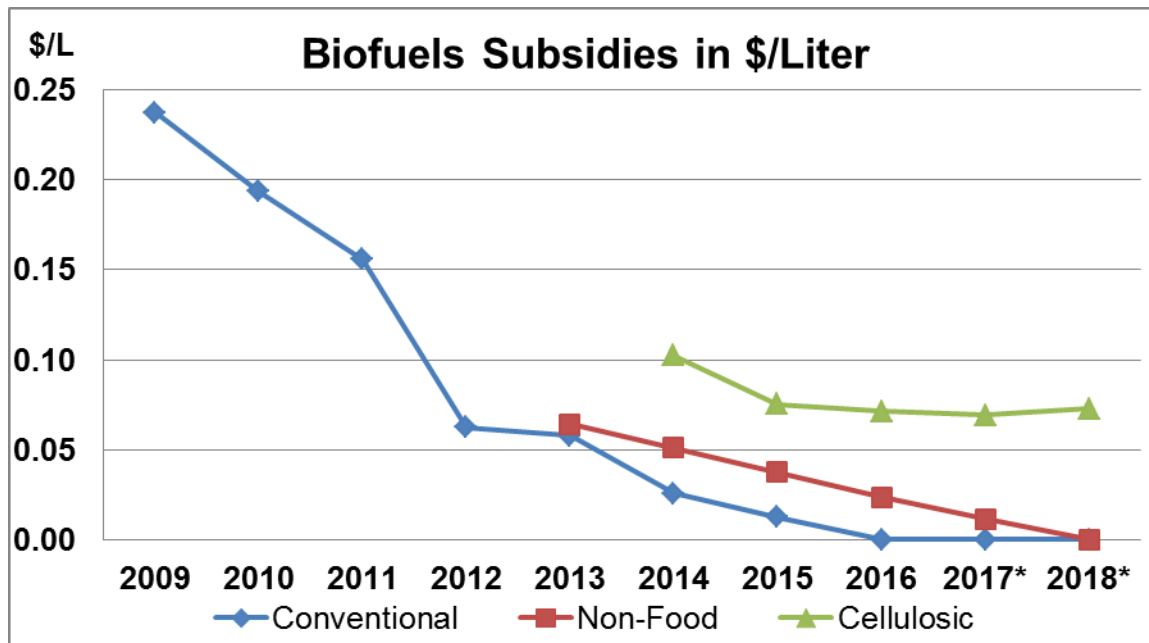
There is no change to the E10 Blended Gasoline Area or Blending Mandates for biofuels from January to October 2017.

Production and Processing Subsidies

With policies that biofuel (including fuel ethanol and biodiesel) development should not compete for arable land designated for food crops (see GAIN report [CH9059](#)), China promotes ethanol production using cassava, sweet sorghum, and other non-food grain feedstocks. Production subsidies for non-food grain feedstocks will phase out by 2018.

From October 2016 to June 2017, several provincial governments in Northeast offered subsidies to state-owned ethanol processors who purchased and processed old-crop inventories from the State Grain Administration. See GAIN report [CH16058](#).

The advanced cellulosic ethanol production subsidy is RMB 600 per ton (\$0.07 per liter). Prospects for 2017 and 2018 remain uncertain as extensions or updates to the original subsidy program have yet to be announced at this time.



Source: Post calculations; Innovation Center for Energy and Transportation; and Pacific Exchange Rate Service. *2017 and 2018 exchange rates are forecasts

II. Gasoline and Diesel Markets

China is the world's top crude oil importer and consumer. However, growth for crude oil demand has moderated due to increasing use of public transportation, fuel efficient cars, and electric vehicles. Future prospects for transportation fuel demand depend on the adoption rate for new energy vehicles, advanced fuel vehicles, and macroeconomic factors.

The World Bank forecast China's 2018 Gross Domestic Product (GDP) growth at 6.3 percent slightly down from 2017 as economic stimulus measures recede.

Fuel Use History (Million Liters)

Calendar Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017E
Gasoline Total	80,911	84,289	96,705	97,123	105,013	123,481	133,360	140,153	154,687	162,825
Diesel Total	161,313	154,269	185,952	181,470	182,769	183,544	180,958	176,416	166,566	164,077
On-road	89,956	92,810	100,179	111,546	126,150	133,718	141,742	144,663	144,563	147,105
Gasoline and Diesel	242,225	238,558	282,657	278,593	287,783	307,026	314,317	316,569	321,253	326,902
Calendar Year	2018 F	2019 F	2020 F	2021 F	2022 F	2023 F	2024 F	2025 F	2026 F	2027F
Gasoline Total	170,477	178,489	186,878	197,913	201,871	205,908	233,689	238,363	243,130	247,993
Diesel Total	162,600	161,137	162,587	162,749	163,009	163,188	163,368	163,548	163,728	163,908
On-road	149,885	152,842	157,259	162,298	164,196	166,093	178,676	180,859	183,086	185,356
Gasoline and Diesel	333,077	339,626	349,465	360,662	364,880	369,096	397,057	401,911	406,858	411,901

Source: 2008-2017 numbers are from NBS and Sinopec; 2018-2027 numbers are Post estimates. Notes:

- These are rough estimates as there is little information on the breakdown of fuel use.
- The average conversion rate for gasoline is 1,256 liters per ton; the average conversion rate for diesel ranges from 970 to 1,195 liters per ton.
- The annual growth rate for gasoline between 2018 and 2021 is estimated at about 5 percent, while the growth rate for gasoline between 2022 and 2027 is estimated at about 2 percent.
- Projections are based on GDP growth trends and energy efficiency.

For the first 6 months in 2017, China imported 212.5 million tons of crude oil (HS 2709) compared to 186.5 million tons the same period a year ago. China Petroleum and Chemical Corporation (Sinopec) estimates that 2017 crude oil imports will reach a record 400.0 million tons.

In May 2017, Sinopec lowered retail gasoline prices about 20 percent from the government-set price in the North East, Northern Plain, and South regions. Lower gasoline prices have discouraged blending with ethanol.

Over the first half of 2017, according to the National Bureau of Statistics (NBS), overall fuel use is estimated at 149.6 million tons, up 5.7 percent from the same period 2016. Overall fuel use has moderated due to slower economic growth, more public transportation options, and greater penetration of more fuel efficient gasoline and electrical powered vehicles.

Vehicle Fleet

Over the past few decades, a growing middle-class has propelled China to become the world's largest automobile market. The national fleet for passenger vehicles continues to expand, while the national

fleet for heavy trucks remains relatively stable. NBS indicated that in 2016 the national civilian vehicle fleet reached 194.4 million (including 8.8 million tri-wheel vehicles and low-speed trucks), up 12.8 percent from 2015. Among these vehicles, privately-owned passenger vehicles accounted for 165.6 million vehicles, up 15.0 percent from 2015. For 2017, vehicle sales are estimated to grow 9.0 percent from 2016 on a jump in consumer demand.

In March 2017, China’s Ministry of Public Security, Transportation Bureau estimated that the national civilian fleet is greater than 300 million vehicles, of which two-thirds are automobiles.

Electric vehicles (EVs) and Hybrid New Energy Vehicles (NEVs)

China is a member of the Electric Vehicle Initiative (EVI), an intergovernmental policy forum under the Clean Energy Ministerial established in 2009. As part of this collaboration, China has implemented subsidies, traffic privileges, and other schemes to encourage NEV adoption.

The International Energy Agency estimates that NEVs in China increased from 336,000 units in 2015 to 648,770 units in 2016, accounting for less than one percent of the national civilian fleet. For the first half of 2017, NEV sales totaled 195,000 units, up 53 percent compared to the same period a year ago.

III. Ethanol

Production

China is the world’s fourth largest ethanol producer and consumer after the United States, Brazil, and the European Union.

Total ethanol production (potable beverage, fuel, and other industrial chemicals) for 2018 is forecast at 22,577 million liters, up about 10 percent from 2017.

China Ethanol Industry Production Mix

In Million Liters	2009	2010	2011	2012	2013	2014	2015	2016	2017 Estimated	2018 Forecast
Ethanol for fuel only	2,466	2,479	2,566	2,858	2,934	2,951	3,078	3,155	3,550	3,950
<i>Ethanol - GEN I</i>	<i>2,397</i>	<i>2,383</i>	<i>2,479</i>	<i>2,724</i>	<i>2,735</i>	<i>2,721</i>	<i>2,835</i>	<i>2,906</i>	<i>3,200</i>	<i>3,550</i>
<i>Ethanol - GEN II</i>	<i>68</i>	<i>96</i>	<i>87</i>	<i>134</i>	<i>199</i>	<i>230</i>	<i>243</i>	<i>249</i>	<i>350</i>	<i>395</i>
Ethanol for other Industrial Chemicals	1,253	1,656	2,053	2,428	2,861	3,970	4,470	5,036	5,357	5,750
Ethanol for beverage or other usage	6,409	7,072	7,858	8,980	9,810	9,842	10,098	10,791	11,525	12,877
All Ethanol Production -China	10,127	11,207	12,477	14,266	15,605	16,763	17,646	18,982	20,432	22,577

Source: Post estimates

Notes: The conversion rate for ethanol is 1,268 liters per ton

Fuel Production

2018 fuel ethanol production is forecast at 3,950 million liters, up modestly from the 2017 estimate.

Industry sources noted that if the current low petroleum prices continue, there is very little incentive to

use ethanol blended gasoline. Major feed stocks are corn (70 percent), cassava (25 percent) and molasses from either cane of beet sugar (5 percent). Industry sources report that wheat is used to produce undenatured ethanol for human consumption.

Ethanol from non-food grain feedstocks is considered advanced biofuels in China. The government and private investors are increasingly interested in using cassava and sweet sorghum, but high operating costs have limited expansion of production capacity as China depends on imported cassava.

Synthetic Ethanol

In January 2017, China launched the world's first coal-to-ethanol production facility in Shaanxi Province. The Shaanxi Yanchang Petroleum facility has about 126.8 million liters (100,000 tons) of production capacity per year and uses indigenous technology developed by the Chinese Academy of Sciences and Dalian Institute of Chemical Physics in Liaoning Province. The facility is on track to expand production capacity to 1,268 million liters (1.0 million tons) of capacity by 2020.

Despite the successful launch of this new technology, China is expected to impose more stringent environmental standards to restrict expansion of coal-to-chemical processing facilities. Ironically, SOEs and private investors continue to show interest in expanding synthetic ethanol production capacity.

Ethanol Used as Fuel and Other Industrial Chemicals (Million Liters)

Ethanol Used as Fuel and Other Industrial Chemicals (Million Liters)										
Calendar Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Beginning Stocks	0	0	0	0	0	0	0	0	0	0
Fuel Begin Stocks	0	0	0	0	0	0	0	0	0	0
Production	3,718	4,135	4,619	5,286	5,795	6,921	7,548	8,191	8,907	9,700
Fuel Production	2,466	2,479	2,566	2,858	2,934	2,951	3,078	3,155	3,550	3,950
>of which is advanced*	68	96	87	134	199	230	243	249	350	395
Imports	0	4	5	15	0	27	687	890	5	5
Fuel Imports	0	3	5	3	0	26	477	872	0	0
Exports	108	156	43	45	40	33	25	34	150	150
Fuel Exports	16	12	8	7	2	1	1	1	5	5
Consumption	3,610	3,983	4,581	5,256	5,755	6,915	8,210	9,047	8,782	9,555
Fuel Consumption	2,450	2,470	2,563	2,854	2,932	2,975	3,555	4,026	3,545	3,945
Ending Stocks	0	0	0	0	0	0	0	0	0	0
Fuel Ending Stocks	0	0	0	0	0	0	0	0	0	0
Total Balance Check	0	0	0	0	0	0	0	0	0	0
Fuel Balance Check	0	0	0	0	0	0	0	0	0	0
Production Capacity										
Number of Refineries	5	5	5	6	6	7	7	10	11	11

Name plate Capacity	2,500	2,500	2,600	3,000	3,000	3,200	3,200	3,600	4,200	4,200
Capacity Use (%)	99%	99%	99%	95%	98%	92%	96%	88%	85%	94%
Market Penetration (Million Liters)										
Fuel Ethanol	2,450	2,470	2,563	2,854	2,932	2,975	3,555	4,026	3,545	3,945
Gasoline	84,289	96,705	97,123	105,013	123,481	133,360	140,153	154,687	162,825	170,477
Blend Rate (%)	2.9%	2.6%	2.6%	2.7%	2.4%	2.2%	2.5%	2.6%	2.2%	2.3%

Source: Post estimates. Post has omitted fuel ethanol feedstock data, which need more research at the time of reporting.

*Note: A major share of advanced ethanol production is non-grain conventional ethanol (GEN II per China's definition) plus a small amount of cellulosic biomass.

Fuel Consumption

2018 fuel ethanol consumption is forecast at 3,950 million liters, up 400 million liters from the 2017 estimate reflecting underlying demand and continued government efforts to promote blending. Ethanol is considered a critical component for China's greenhouse gas emissions commitments. Eleven provinces and 40 local municipal governments have adopted fuel ethanol blending mandates, which can contribute to China's commitments toward greenhouse gas emissions.

In 2018, the blend rate for ethanol-gasoline is projected at 2.3 percent, marginally higher than the 2017 estimate on continued expansion in overall gasoline use. As of this writing, there has been no expansion of the E10 mandate pilot zones in 2017.

But with the announcement of the implementation plan regarding the Expansion of Ethanol Production and Promotion for transportation fuel, taken with China's ongoing corn sector reform, fundamental transformation of the coarse grains, distillers' dried grains, and ethanol markets will happen in China. The National Bureau of Statistics shows total gasoline consumption in 2016 at 120 million tons. If this estimate is accurate it would mean that attaining the E10 blend goal will require 15,216 million liters (12 million tons) of transportation fuel ethanol, equivalent to 36 million tons of corn feedstock. At present, industry sources noted that they are not aware of any expansion of existing ethanol plants (dry-milling) at this time.

Trade

For 2018 total ethanol imports are forecast at 5 million liters as greater domestic supplies. Of that, fuel ethanol imports are forecast below one million liters on expectations that the high tariff will curb import demand. For 2017, ethanol imports are estimated at 5 million liters based on the imported volume for the first six months. Fuel ethanol imports are expected to amount to less than one million liters reflecting the slow pace during the first 6 months.

Effective January 2017, the import duty for U.S. denatured ethanol (HS: 220710) was increased to 30 percent from the previous rate of 5 percent. The import duty for undenatured ethanol (HS: 220720) remains unchanged at 40 percent and biodiesel (HS: 382600) remains unchanged at 6.5 percent.

Tariff and Taxes on Ethanol (2009 to 2016)

HS#		Import Tariff Rate	VAT on Import	Consumption Import Tax	VAT Rebate on Export
220710	Undenatured	40%	17%	5%	0%
220720	Denatured	5%	17%	5%	0%

Tariff and Taxes on Ethanol (Effective January 1, 2017)					
HS#		Import Tariff Rate	VAT on Import	Consumption Import Tax	VAT Rebate on Export
220710	Undenatured	40%	17%	5%	13%
220720	Denatured	30%	17%	5%	0%

Source: China General Administration of Customs, Import and Export Tariffs

In 2012, free trade agreements removed import tariffs for ethanol (undenatured and denatured) and biodiesel, originating from ten ASEAN countries plus Chile and Pakistan. Imports from these countries remain small.

For 2018, ethanol exports are forecast at 150 million liters on expectations of continued government efforts to promote corn processing and lower inventories. China's General Department of Taxation announced the country reinstated a 13 percent tax rebate for exporting 10 corn by-products, including undenatured ethanol with purity above 80%, starting from September 1, 2016. The move is reportedly aimed at reducing corn stocks. The export rebate policy was first launched on June 1, 2009, and has been cancelled twice during the past seven years.

For 2017, ethanol export estimates are at a record 150 million liters with strong sales to Saudi Arabia and North Korea during the first six months. Traders report that the reintroduction of the export rebate last year and subsidies to processors revived foreign sales. Fuel ethanol exports, however, are expected to remain small.

IV. Biodiesel

The biodiesel industry remains in its early stages of development and faces challenges throughout the value chain. In 2015 and 2016, the market competitiveness for biodiesel diminished with falling international crude prices, falling overall domestic demand for diesel and quality issues. A lack of handling standards for biodiesel feedstock and processes has led to a decline in production capacity to nearly one-quarter of its former size.

The 13th FYP includes an ambitious goal to produce 2,272 million liters of biodiesel by 2020. Given the current situation, it is unlikely the industry will meet the goal. Previous support policies for the biodiesel industry in the China energy market have proven ineffective.

Fuel Production

2018 biodiesel production is forecast at 500 million liters, unchanged from 2017, on steady diesel demand, limited government support, and stagnant capital investment. Used cooking oil (UCO), also known as “gutter oil”, is the primary feedstock. However, UCO remains an unreliable source for many

processors primarily due to challenges in sourcing quality inputs. In 2013, researchers at Tsinghua University estimated that China is the world's leading producer of waste oil, which includes UCO, producing 13.74 million tons in 2010.

The Chinese Academy of Sciences reports that national biodiesel capacity is approximately 3,408 to 3,976 million liters (3.0 to 3.5 million tons). Industry sources estimate biodiesel production in 2016 at 2,370 million liters, less than 15 percent of total capacity. Industry sources estimated that less than 30 plants are in operation in 2017.

Biodiesel (Million Liters)										
Calendar Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Beginning Stocks	0	0	0	0	0	0	0	0	0	0
Production	591	568	738	909	1,079	1,133	545	500	500	500
Imports	0	0	0	49	895	1028	34	8	10	10
Exports	0	0	0	0	0	29	21	68	150	150
Consumption	591	568	738	958	1974	2132	558	440	360	360
Ending Stocks	0	0	0	0	0	0	0	0	0	0
BalanceCheck	0	0	0	0	0	0	0	0	0	0
Production Capacity										
Number of Biorefineries	62	45	49	52	53	53	31	30	28	28
Nameplate Capacity	2,670	2,556	3,400	3,600	4,000	4,000	2,431	2,372	2,680	2,680
Capacity Use (%)	22.1%	22.2%	21.7%	25.3%	27.0%	28.3%	22.4%	21.1%	18.7%	18.7%
Feedstock Use for Fuel (1,000 MT)										
Used Cooking Oil	578	556	722	889	1,055	1,108	512	490	490	490
Market Penetration (Million Liters)										
Biodiesel, on-road use	177	170	221	270	1,116	1,249	143	133	133	133
Diesel, on-road use	92,810	100,179	111,546	126,150	133,718	141,742	144,663	145,563	147,105	149,885
Blend Rate (%)	0.2%	0.2%	0.2%	0.2%	0.8%	0.9%	0.1%	0.1%	0.1%	0.1%
Diesel, total use	154,269	185,952	181,470	182,769	183,544	180,958	176,416	166,566	164,077	162,600

Sources: Post estimates.

Notes: Conversion rate for used cooking oil to biodiesel is 1 to 0.9.; the conversion rate for biodiesel is 1,136 liters per ton.

Fuel Consumption

Unlike ethanol, the Chinese biodiesel sector is not supported by a broad number of local and provincial blending mandates.

The industrial sector accounts for 54 percent of total biodiesel use in 2016. Agricultural machinery and fishing vessels accounted for 18 percent of total use. The on-road transport sector accounts for about 28 percent of biodiesel use. However, in relative terms, biodiesel accounts for just 0.1 percent of total on-road diesel use.

Biodiesel demand peaked in 2013 and early 2014 during a period of record high international crude prices. State-owned petroleum refiners blended lower-priced biodiesel with high-priced petroleum-based diesel to lower production costs and raise production output.

Since the fall of international crude oil prices in 2014, petroleum-based diesel prices dropped. In response, China National Petroleum Company and China Petroleum and Chemical Corporation (Sinopec), which control over 90 percent of retail fueling stations, sharply lowered their biodiesel use. Today, the two leading national fuel distributors offer biodiesel at a limited number of their fueling stations. The national market for biodiesel has collapsed to a small number of regional brokers or direct marketers who service transportation fleets and farmers.

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 1-3 percent.

Trade

For 2018, biodiesel imports are expected at the same level as 2017. Imports for 2017 are revised up slightly from the previous post estimate reflecting stronger shipments from Malaysia during the first half of 2017. For 2018 biodiesel exports are forecast at 150 million liters same as the revised 2017 estimate. Exports for 2017 are revised up on strong sales to the Netherlands during the first 6 months in 2017. Exports and consumption in 2016 are revised using the most recent trade statistics.

In 2012, China signed free trade agreements with ten ASEAN countries plus Chile and Pakistan and removed import tariffs on biodiesel.

Tariff and Taxes on Biodiesel (2009 to 2017)					
HS#		Import Tariff Rate (MFN)	VAT on Import	Consumption Import Tax	VAT Rebate on Export
271020	Petroleum and biodiesel mixtures	6%	17%	5%	0%
382600	Biodiesel and mixtures	6.5%	17%	5%	0%

Source: China General Administration of Customs, Import and Export Tariffs

V. Advanced Biofuels

Based on industry information, the government has unofficially set a target to produce 3,801 million liters of cellulosic and non-grain based ethanol by 2020. According to China's Ministry of Agriculture, the potential collectable resource of crop residue is 687 million tons. One-third of this volume of feedstock will yield an estimated 40 to 50 million tons (50,720 to 63,400 million liters) of cellulosic ethanol annually. 2018 advanced biofuels production is forecast at 395 million liters, up from 2017 on expanded production capacity. The implementation plan concerning the Expansion of Ethanol Production and Promotion for transportation fuel also calls for China to shift renewable fuel production

to commercial scale cellulosic ethanol by 2025.

VI. Biomass for Heat and Power

Overall, the sector remains in an early stage of development. Several private initiatives have been proposed to develop direct-burn biomass power generation projects focused on either specific sorghum varieties or tapping plentiful corn, rice, and wheat residues from row crop production. Recently (August 2017), Chinese media reported the Zhanjiang Biomass Power Plant in Guangdong province is the largest biomass power plant in the world. It produces electricity by consuming local feedstocks, including mallet bark and bagasse. The power plant can supply over 650 million kilowatt-hours on a yearly basis.

Traditionally, Chinese growers burn crop residues at the end of the season causing significant air pollution. Direct-burn projects aim to offer economic incentives to growers to collect and market their farm residues for efficient power generation and large-scale incineration. Biomass development remains limited, however, because of challenges collecting and distributing bulky farm residues. Further market expansion will require improved road infrastructure at the provincial-level and capital investment for field access and equipment at the farm-level.

VII. Notes on Statistical Data

Policy

The variance between official volumetric blending rates where mandated and actual blend rates is difficult to measure and there appear to be no reliable sources at this time.

It is unclear at this time whether blending rates for biodiesel are enforced or blending rates for biodiesel are not implemented.

The Chinese government initially announced subsidies for cellulosic ethanol production for a defined period. However, the renewal or termination of subsidies remains unclear.

Gasoline and Biodiesel Markets

Official Chinese statistics for economic growth are subject to interpretation.

Chinese national forecasts for 2017 and 2016 estimates for gasoline use are unavailable. Instead, China National Petroleum Company (CNPC) Research Center statistics were cited. Chinese National Bureau of Statistics estimates were used for historical data from 2005 to 2015.

China does not publish automobile sales forecasts. Instead, China Association of Automobile Manufacturers data was used.

2016 national road network statistics are not available from the National Bureau of Statistics.

2016 annual kilometers-driven are not available from the National Bureau of Statistics.

Ethanol

Official statistics does not breakdown beverage and industrial production, making it difficult to determine the exact mix.

There is not a reliable source for estimates of non-food grain feedstock fuel ethanol production, or a method to calculate an imputed value for this statistic at this time.

Synthetic ethanol statistics for overall production capacity in operation and current production volumes are not available.

The share of E10 gasoline consumption is difficult to measure as there is no official gasoline consumption data or other ethanol-gasoline blends.

There is no reliable source for a national and regional fuel ethanol price series at this time.

There is no reliable source for ethanol inventories at this time.

Biodiesel

There is no data to support commercial operations processing vegetable oil, animal fats, or advanced biodiesel feedstocks into biodiesel at this time.

The share of B5 consumption is difficult to measure without official diesel consumption data or other biodiesel-diesel blends.

There is no reliable source for biodiesel inventories at this time.

Advanced Biofuels

It is unclear whether corn stover or corn cobs are used for cellulosic ethanol research and production.

Biomass for Heat and Power

Several anecdotal reports and industry sources have discussed ongoing efforts to develop direct-burn biomass power generation in China. However, at this time, there are not investment estimates or publicly announced projects. Therefore, data for biomass heat and power is not available.