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Report Highlights:

China has unofficially suspended its goal (established 2017) to implement a nationwide E10 mandate by the end of 2020. With the world's fastest growing gasoline fuel pool, limited ethanol production capacity, and a recent drop in corn stocks and corresponding rising corn prices, the government rollout of the mandate has stalled and cannot be achieved. Ethanol production capacity has continued to expand since 2017, but even operating at full capacity, the average blending rate would not exceed 4 percent (E4) this year. In the wake of the E10 suspension, the COVID-19 pandemic significantly lowered gasoline consumption in the first half of 2020, while ethanol production capacity shifted from fuel to medical grade ethanol, further driving down the blend rate. Fuel ethanol production and consumption for 2020 are expected to drop as will the average blend rate. Biodiesel policy support remains mostly absent beyond a limited program in Shanghai.

Acronyms

Chinese Academy of Sciences (CAS)
Carbon Emission Footprint (CEF)
Carbon Emissions Trading System (ETS)
China Association of Automobile Manufacturers (CAAM)
China National Cereals, Oils and Foodstuffs Corporation (COFCO)
China National Offshore Oil Company (CNOOC)
China National Petroleum Corp (CNPC)
China National Petroleum Corp, Publicly listed-arm (PetroChina)
China National United Oil Corp, CNPC Trading-arm (Chinaoil)
China Petroleum and Chemical Corporation (Sinopec)
China Petroleum and Chemical Corporation, Trading-arm (Unipecc)
Chinese People's Political Consultative Conference (CPPCC)
Dried Distiller's Grains with Solubles (DDGs)
Electric Vehicle (EV)
Ethyl Tert-Butyl Ether (ETBE)
Five-Year Plan (FYP)
General Administration of China Customs (GACC)
Greenhouse Gas (GHG)
Ministry of Ecology and Environment (MEE)
Ministry of Environmental Protection (MEP)
Ministry of Finance (MOF)
Ministry of Public Security (MPS)
National Development and Reform Commission (NDRC)
National Energy Administration (NEA)
National People's Congress (NPC)
New Energy Vehicles (NEV)
Particulate Matter (PM)
Renminbi (RMB)
State Council Tariff Committee (SCTC)
Used Cooking Oil (UCO)

Executive Summary:

China has unofficially suspended its goal (established 2017) to implement a nationwide E10 mandate by the end of 2020, with no discussion of permitting an extension of the deadline. With the world's fastest growing gasoline fuel pool, limited ethanol production capacity, and a recent drop in corn stocks and corresponding rising corn prices, the government rollout of the mandate has stalled and cannot be achieved. China is the only country in the world that the International Energy Agency (IEA) is projecting an increased pool size for 2020.

The central government has reportedly delegated reaching E10 blending goals and decision-making authority to provincial governments. While northern provinces (corn producing regions) continue building new plants, southern provinces can continue to import should economic factors allow. Industry reports the central government unofficially plans to lower E10 to E5 mandate at the end of 2020, effectively backing away from the E10 goal.

In the wake of the E10 suspension, the COVID-19 pandemic took center stage in first half of 2020. Travel bans to stop the spread significantly lowered national gasoline consumption. Some preliminary estimates show that China's gasoline production and consumption both dropped by as much as 30 percent year-on-year in the first quarter of 2020. Record low international petroleum prices, initially due to both the Russia-Saudi oil price war and COVID-19 travel bans, further dampen oil companies' willingness to blend fuel ethanol into gasoline as domestic gasoline prices have fallen below the price of fuel ethanol since March. At the same time, high corn prices pushed up the cost of fuel ethanol production, forcing the provinces/cities which had announced new 2020 E10 expansion plans in 2019 to scale back implementation. Domestic fuel ethanol producers are reporting high stock levels. China's top fuel ethanol producers even shifted some capacity to produce pharmaceutical grade (70% purity) ethanol for use as disinfectant to combat COVID-19. As a result, fuel ethanol production and consumption for 2020 are both expected to drop by 25-30 percent. Post estimates a national average blend rate of 1.7 percent in 2020, down from 2.4 percent in 2019. By comparison, China's peak nation-wide average fuel blend rates were achieved 10 years ago never reaching above 2.8 percent.

The COVID-19 epidemic greatly lowered the supply of used cooking oil (UCO), which is China's biodiesel feedstock, as the restaurant and catering industry suddenly suspended business. The epidemic also resulted in a similar impact on China's biodiesel consumption, decreasing consumption by almost 30 percent. However, robust exports to the European Union (EU) enabled Chinese biodiesel producers to increase production. Post estimates a 0.3 percent biodiesel blend rate in 2020, similar to the previous two years.

I. Policy and Programs

Biofuels are part of China's long-run strategic plan to protect the environment, conserve resources, and reduce dependence on imported energy. However, ethanol is the only biofuel receiving attention from China's policy makers. With ambitious emissions targets and policies, China's ethanol programs support several national initiatives to manage air pollution. Support for biodiesel (mandates, producer subsidies, and pricing policy) which can deliver similar benefits to lower air toxins remains noticeably absent. For more details, see GAIN reports [CH16058](#), [CH16067](#), [CH17048](#), [CH18041](#) and [CH19047](#).

Environmental Commitments

In November 2015, China's State Council unveiled the 13th Five-year Plan (FYP) for Economic and Social Development (2016-2020) focusing on: energy consumption reduction; environmental protection; and renewable and biomass energy use. The State Council also released "The Energy Development Strategy Action Plan (2016-2020)" which aimed to cap annual energy use and set a goal of reaching 15 percent of non-fossil fuel-based energy usage in the country's primary energy mix by 2020. Ethanol was considered a critical component of this plan although biodiesel and the diesel pool have been completely neglected at the national level.

Blue Sky Protection Plan 2018

On July 3, 2018, China's State Council released a three-year "Blue Sky Protection Plan (2018-2020)" to reduce emissions for sulfur dioxide and nitrogen oxides by at least 15 percent from 2015 levels, and an 18-percent reduction in the density of particulate matter by 2020. The announcement proposed new restrictions on sales of fuel blending components such as methyl tert-butyl ether (MTBE), and the blending of chemical feedstocks in refined oil products. This was the first time that petrochemical feedstock blend use was restricted in refined oil products, which would further boost demand for fuel ethanol as a transportation fuel additive if acted upon.

In 2018, China's Ministry of Ecology and Environment (MEE) announced more stringent air pollution abatement measures across Beijing, Tianjin, and Hebei province, some of China's most populous urban areas. The plan called for lowering the average intensity of PM_{2.5}—a major air pollutant—and the number of "heavy pollution" days to 3 percent from October 1 to March 31 across this area. In May 2020, MEE acknowledged that PM_{2.5} concentrations in key regional cities remained above the national standards.

The Blue Sky Protection Plan was due to conclude in 2020, however, China's ambitious drive to curb air pollution is facing headwinds this year as authorities attempt to balance environmental targets with slowed economic growth from the pandemic. The State Council may not stick to the strict environmental protection plan while drafting the 14th FYP for Economic and Social Development (2021-2025).

New China VI Vehicle Emissions Standards

As part of the Blue Sky Protection Plan, on June 28, 2018, MEE announced that higher fuel emissions standards for all new passenger vehicles and heavy trucks will enter into force nationwide beginning on July 1, 2020.

Upon implementation, the new emission standards will reportedly be among the world's most stringent emissions standards. Compared to the current China V emissions standards, implemented in January 1, 2016, vehicles will be subject to further limitations for particulate and greenhouse gas emissions. See GAIN report [CH16067](#). China's new emissions standards (GB 17691-2018) for diesel heavy-duty trucks are based on the Euro VI emission standard went into effect on January 1, 2020 with a phased roll out.

National and Provincial Ethanol Blend Mandates

Chinese law restricts fuel ethanol processing to licensed facilities that produce and supply fuel ethanol to national refiners and fuel marketing companies. Provincial Development and Reform Commissions (DRCs) are responsible for the distribution of franchise licenses for fuel production, refining, and

marketing. (See Section III. Ethanol Production). It was forecast that the original plans to reach E10 in 2017 and 2018 would result in a fuel ethanol supply gap of more than 14.04 billion liters below China's E10 target in 2020. See Section II. Gasoline and Diesel Pools for more information.

On September 13, 2017, China's National Development and Reform Commission (NDRC), the National Energy Administration (NEA), the Ministry of Finance, and 12 other Ministries jointly announced an "Implementation Plan Regarding the Expansion of Ethanol Production and Promotion for Transportation Fuel." According to the plan, China would achieve nationwide 10 percent blend of ethanol (E10) by 2020. Additionally, by 2025, China planned to shift renewable fuel production to commercial-scale production of cellulosic ethanol.

On August 22, 2018, Chinese Premier Li Keqiang addressed China's State Council, and reiterated the central government's commitment to expand ethanol use nationwide, and to lower government inventories of grain in an orderly manner. State media reported that Premier Li announced a commitment to limit annual biofuels use to 12.67 billion liters (10 million tons), well below the level needed to reach nationwide E10.

In December 2019, media reported that China will suspend the E10 mandate, essentially confining it to where it is already being used. The rationale given for the change in policy was lower corn stocks and an existing ethanol production capacity too small to fully implement E10 nationwide. In fact, even though capacity has continued expanding since 2017, even if fully utilized in 2020, the maximum blend achievable is not more than E4. While NEA published a guide on energy work in June 2020, it only includes one sentence mentioning fuel ethanol, calling to "perfect fuel ethanol policy system, appropriately expand the production of biofuel ethanol and the promotion and usage of ethanol gasoline for car use." With no further information or goals stated.

E10 Production Forecast for 2020

Prior to the unofficial suspension of the E10 mandate and the COVID-19 epidemic, to meet domestic demand, without factoring in imports and keeping exports nominal, China needed to expand fuel ethanol production from 12.7 to 19.0 billion liters (10 to 15 million tons). Even if China's existing approved fuel ethanol projects boost capacity by 2.7 billion liters per year (2.1 million tons), and begin operation in 2020, the additional output would not meet E10 demand nationally by the end of this year but only reach E4. If China had fully implemented a national E10 blending program by 2020 as originally planned, the IEA and China's National Energy Administration both projected that China would consume about 19 billion liters (15 million tons) of fuel ethanol in 2020, or five times greater than 2017 consumption (3 million tons). Officials have reportedly decided to maintain E10 expansion at the 2019 level. Impacted by COVID-19, China is projected to consume 3.01 billion liters (2.4 million tons) of fuel ethanol in 2020, returning to the 2017 consumption level. With imports expected to remain limited in 2020, production is projected to drop to 3.2 billion liters, only 200 million liters higher than 2017.

Phased Adoption and Actual Implementation of E10 Varies by City and Province

Since 2006, China has expanded in a piecemeal fashion the number of cities and provinces adopting E10 blending mandates. Actual rates of fuel ethanol blended into gasoline supplies, reportedly, varies city-by-city and province-by-province and has often fallen below the local mandate due to varying levels of enforcement. The level of implementation often reflects the volume of fuel ethanol produced in each region which can vary depending on corn and oil (gasoline) prices and availability of feedstocks.

Efforts to Extend E10 Nationally Beginning in 2017

By 2019, seven provinces and cities had fully implemented mandatory E10 fuel ethanol blending. These were Anhui, Guangxi, Heilongjiang, Henan, Jilin, Liaoning, and Tianjin provinces. Another five provinces had partially implemented E10 at varying levels. These were Hebei, Shandong, Jiangsu, Inner Mongolia, and Hubei provinces. Another three provinces (Shanxi, Zhejiang, and Guangdong) launched pilot programs in a few select cities. These pilots and plans listed below are reportedly either scaled down or currently stalled.

Beijing-Tianjin-Hebei Region

Beijing will delay implementation of an E10 program due to concerns over the uncertain impact on nitrogen oxide emissions. Officially, Tianjin started fully implementing E10 citywide on September 30, 2018, however, industry sources report that blending is far below 10 percent. Tianjin province's E10 demand is estimated this year at nearly 330 million liters (260,000 tons). In June 2019, Hebei province doubled the number of cities offering E10, but industry sources reported that progress slowed in 2020. If Hebei offers E10 province-wide, it would consume an estimated 760 million liters (600,000 tons) of fuel ethanol each year.

Yellow River Plain Region

Shandong province was on track to implement E10 province-wide by 2020. Officials aimed to more than double the number of cities participating in the pilot program in 2019, achieving province-wide coverage by 2020. However, progress has slowed significantly. In 2019, Shanxi province launched a pilot 10 percent blend program with an official plan to extend the program province-wide by 2020. Shanxi currently has no government-authorized fuel ethanol producers, but the province has methanol production and has administered a pilot program for some years which promotes methanol blended gasoline. Assuming it would continue to use methanol at current levels, industry estimates that Shanxi province would need to consume approximately 475 million liters (375,000 tons) of fuel ethanol annually to meet the 10 percent goal and that ethanol would need to be procured from neighboring provinces.

Yangtze River Delta Region

Shanghai is one of China's largest gasoline fuel markets. Industry sources reported that Shanghai authorities were examining a plan to roll out E10 gasoline blends in late 2019, and transition towards citywide coverage in 2020. Since 2016, Jiangsu province partially implemented E10, and was projected to begin transitioning towards full implementation in 2020. Industry sources also reported that Hubei provincial officials aimed to fully implement E10 province-wide by 2020. In 2019, Zhejiang province launched an E10 program in two cities, and was projected to transition to a province-wide program by 2020. But no progress has been reported.

Pearl River Delta Region

Officials in Pearl River Delta Region have not yet announced any expansion plans in 2019. The Pearl River Delta in South China is grain-deficient and costs for ethanol production and blending are high. If provincial mandates were to be adopted, South China would most likely be import dependent until advanced cellulosic production technologies can be commercialized at large scale.

Government Financial Support for Ethanol Production

Past central government subsidies for fuel ethanol production supported both feedstocks and production inputs. Starting in 2009, central government production subsidies for grain-based conventional ethanol which were as high as \$0.25/liter began phase out and were eventually eliminated in 2016. From 2016 to 2018, provinces in North East China offered corn processors and ethanol facilities generous subsidies (See GAIN report [CH9059](#) and Annex 1). But in 2019, provincial authorities did not renew corn-processing subsidies. (See GAIN report [CH16058](#).)

The advanced cellulosic ethanol production subsidy is \$0.07 per liter (600 RMB per ton). Since 2018 there have been no additional announcements, or updates to the original subsidy program.

On June 30, 2019, NDRC and MOFCOM jointly released the 2019 Catalogue of Encouraged Foreign Investment in Industries, which includes fuel ethanol development and production. However, the catalogue specifically prohibits foreign investment into grain-based ethanol production.

2018 was a banner year for newly announced syngas and waste gas projects to produce fuel ethanol in China. Deals and agreements totaling several billions of U.S. dollars were signed to fund a total of seven syngas-to-ethanol and waste gas-to-ethanol projects in Shanxi, Henan, and Xinjiang provinces. Total name plate capacity for the group of projects is estimated to reach nearly 3.0 billion liters. As planned, it is hoped the projects will begin operating over the period from 2019 to 2035. However, the time horizon for completion is long, and there is no certainty that the planned scope of commercialization will ever be achieved. The investment costs are far higher and the production capacity at commercial scale far smaller than the cost and scale of today's conventional feedstock-biofuel plants. The feedstock sources are municipal sewage waste, industrial flue gas, and fossil fuels.

Import Tariffs

On December 19, 2016, the State Council Tariff Committee (SCCTC) released the 2017 Tariff Adjustment Plan, which adjusts applied tariff rates in 2017.

Denatured Ethanol (HS 220720) - sales of fuel ethanol to China have fallen under this code

On January 1, 2017, the tentative tariff rate for denatured ethanol (HS 22072000) rose from 5 percent to the World Trade Organization (WTO) Most-Favored Nation (MFN) bound rate of 30 percent.

Subsequently,

- On April 2, 2018, China levied an additional 15-percent tariff on U.S.-origin denatured ethanol in response to the U.S. 232 Action, raising the tariff from 30 percent to 45 percent.
- On July 6, 2018 China imposed an additional 25-percent tariff on imports of U.S. denatured ethanol in response to the U.S. 301 Action, raising the effective tariff to 70 percent. (See GAIN reports [CH18017](#) and [CH18018](#)).

Undenatured Ethanol (HS 220710)

MFN tariff rates on undenatured ethanol were raised to 40 percent on January 1, 2017. On August 3, 2018, MOFCOM announced an additional tariff on U.S.-origin undenatured ethanol, raising the tariff by 25 percent from 40 to 65 percent. (See GAIN report [CH18047](#)).

HS Code		MFN	232	301
22072000	Ethyl Alcohol & Other Spirits, Denatured of Any Strength	30%	15%	25%
22071000	Undenatured Ethyl Alcohol, Of Alcohol V.≥80%	40%		25%

On February 18, 2020, China announced a new round of tariff exclusions for U.S. agricultural commodities impacted by the retaliatory Section 301-tariffs levied by China. Denatured ethanol (HS Code: 22072000) is included in the list with the announcement effectively lowering the duty on U.S. fuel ethanol from 70 percent back to 45 percent for those importers who apply for the exclusion. Tariff exclusions are approved for individual importers and will not automatically extend to all importers. Undenatured ethanol (HS Code: 22071000) is not on the list, but eligible importers can also apply for an exclusion for this product. The application process through China's Ministry of Finance (MOF) website opened on March 2, 2020. See FAS-Beijing's February 26, 2020 report "[China Announces a New Round of Tariff Exclusions](#)" for more information.

Petroleum Oils Containing Biodiesel and Biodiesel (HS 27102000 and HS 382600)

On August 23, 2018, China imposed an additional 25-percent tariff on U.S.-origin petroleum oils containing 1 to 30 percent biodiesel (HS code 27102000, Petroleum oils containing up to 30 percent biodiesel by volume), which effectively raised the tariff from 6 percent to 31 percent (See GAIN report [CH18034](#)).

Tax Benefits

In 2017, China's General Department of Taxation lowered the effective value added tax (VAT) applied to exported ethanol products from 13 percent to 11 percent. (See GAIN report [CH18022](#)). Biodiesel exports made from used animal and vegetable oils (most commonly referred to as "used cooking oil" or (UCO)) enjoy a 70-percent VAT rebate. Qualified producers also benefit from a 90-percent discount on taxable income from relevant products. To support domestic biodiesel use, tax authorities have issued policies to waive consumption taxes on B100 biodiesel produced from UCO.

II. Gasoline and Diesel Pools

China recognizes the strategic value of energy independence. Biofuels reduce dependence on imports of fossil fuel supplies. China's ballooning crude oil imports and a domestic appeal to improve air quality are driving the adoption of expanded fuel ethanol consumption, and demand for alternative transportation options like New Electric Vehicles (NEVs). It is therefore curious there is no national program of support for biodiesel which would also address crude oil import dependency, improve air quality, and where there is less opportunity to slow diesel pool growth as compared to gasoline.

In 2009, China's gross crude oil imports were only half of the current volume, or 4 million barrels per day. Today, China is the world's top destination for crude oil. In 2018, China's gross crude oil imports rose to 461.9 million tons, up 9.2 percent from 2017. According to the General Administration of Customs of China, during the first quarter of 2020, China imported 245 million tons of crude oil, up 8.8

percent year-on-year. While import dependence has grown, a large portion of crude oil import growth serves a growing export-oriented, value added fuel products industry. With significant overcapacity, China is among the world's largest exporters of refined oil products. Over the first quarter of 2020, China exported nearly 5.715 billion liters (4.55 million tons) of gasoline, up 21 percent year-on-year, and 5.859 billion liters (6.3 million tons) of diesel, up 3.9 percent year-on-year.

China's gasoline market is now the second largest in the world having surpassed the combined demand of the 27 countries European Union plus the United Kingdom in 2013. It is only exceeded by the United States. But unlike the U.S. market, where growth has slowed to very low rates, China's gasoline market continues to expand rapidly with year-to-year growth surpassing all other markets. China's total diesel market is the third largest in the world; about 15 percent smaller than the United States and 40 percent than the EU27 plus United Kingdom. In the medium- to long-term, energy analysts forecast that China's rapid expansion of gasoline demand will slow due to slower economic growth, saturated automotive markets, and introduction of NEVs.

Sinopec expects China's 2020 refined oil demand will increase by 1.2 percent due to the epidemic. The IEA's June 2020 forecasts show China's gasoline and total diesel pools (shown in the table below) including blended biofuels growing at half of one percent in 2020. This growth rate is far lower than historical or future projected growth rates for China. However, China is the only country that IEA currently shows will see increases in 2020. Industry reported from January to March 2020, China's national refined oil consumption fell 13 percent compared with the same period in 2019, among which gasoline consumption was down 0.1 percent and diesel consumption was down 16 percent. The Fuel Use Table below covers the entire fuel pools of refined fossil fuels and additives in finished fuel products including biofuels.

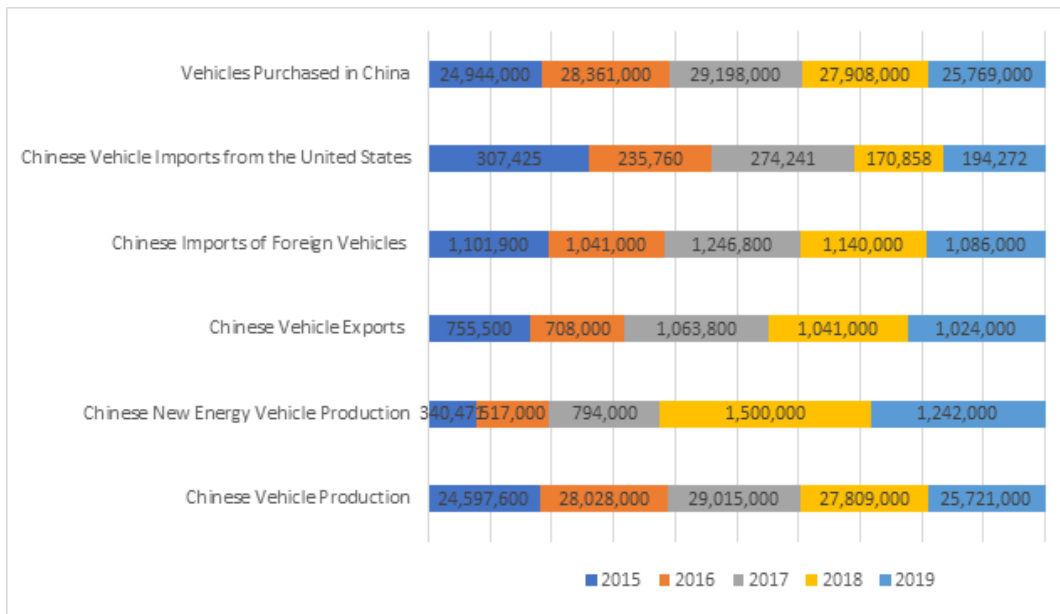
Fuel Use History (Million Liters)										
Calendar Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020f
Gasoline Total	105,738	113,592	130,019	135,837	157,487	164,957	172,111	173,661	180,826	181,715
Diesel Total	186,890	202,765	205,205	205,177	206,730	200,868	200,828	195,228	208,262	209,460
On-road	121,479	131,797	133,383	133,365	134,375	130,564	130,538	126,898	135,370	136,149
Agriculture	15,357	16,510	16,168	17,261	17,986	17,290	17,857	17,784	18,981	19,090
Construction & Mining	6,239	6,732	6,271	6,670	6,654	6,436	6,701	6,853	7,315	7,357
Shipping & Rail	467	506	513	390	279	258	255	233	248	250
Industry	25,022	22,278	19,904	18,879	18,092	16,522	15,867	15,790	16,853	16,950
Heating	45	29	27	29	53	68	69	64	68	68
Jet Fuel and Other Kerosene	22,919	24,686	27,309	29,487	33,627	37,610	42,004	47,269	49,883	36,199
Total Fuel Markets	315,547	341,043	362,528	370,324	397,594	405,938	413,141	414,560	438,123	427,374

Source: 2011-2020 Gasoline, Diesel and Jet Fuel and Other Kerosene estimates are based mostly on IEA data in million liters. All other estimates are Post calculations based on the NBS series.

World's Largest Light-duty Vehicle Fleet

In 2010, China surpassed the United States as the world's largest light-vehicle (passenger) market and leads the world in total new passenger vehicle sales. Despite several decades of continuous growth, China's automotive market faces headwinds in the long-term. According to the Ministry of Public Security (MPS), by the end of 2019, China's national fleet reached 348 million vehicles, up 6.4 percent

from 2018. China Association of Automobile Manufacturers data shows, over 25 million vehicles were sold in 2019. This included 21.44 million passenger vehicles, down 9.6 percent from 2018, and 4.32 million commercial vehicles, down 1.1 percent from 2018.



Sources: Trade Data Monitoring, Ministry of Industry and Information Technology, China Association of Automobile Manufacturers

Shift from New Energy Vehicle (NEV) Buyer Subsidies to Production Quotas and Public Investment

China defines New Energy Vehicles (NEVs) as plug-in electric and gasoline/diesel-electric hybrid vehicles. Currently, NEVs make up 1.5 percent of China’s passenger vehicle market. Although the rate of NEV growth is impressive, the actual market impact on ethanol demand will remain small for many years to come.

By the end of 2019, MPS reported that China’s national NEV fleet reached 3.81 million vehicles, up 1.2 million cars or 46 percent compared with 2018 end. Industry sources report that at the consumer-level generous government subsidies and buyer incentives such as road and parking access continue to support China’s NEV market. In April 2020, a number of Chinese ministries jointly issued a notice to extend NEV subsidies to 2022. In 2019, China produced 1.24 million units and sold more than 1.21 million units, down for the first time by 17 percent and 4 percent respectively year-on-year.

“Made in China 2025” is a central government initiative to upgrade China’s national industrial base from a low-cost, mass production manufacturer to higher value-added, advanced production manufacturer. The plan prioritizes 10 sectors, including the automotive and NEV sectors.

The initiative’s objectives are both supply and demand based. On the supply-side, China has established a production quota for manufacturers to produce 1 million units of pure electric and plug-in hybrid cars in China by 2020 and raise the market share of domestically produced NEVs to 70 percent of demand. On the demand-side, China’s Ministry of Industry and Information Technology (MIIT) targets national

vehicle sales at 35 million vehicles by 2025, of which 20 percent will be NEVs. In 2018, the China Association for Science and Technology projected that NEV sales would account for 30 percent of China's total vehicle sales by 2030.

Ethanol Used as Fuel and Other Industrial Chemicals (Million Liters)										
Calendar Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020f
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	4,619	5,286	5,795	6,921	7,868	8,071	9,211	9,770	10,740	10,830
Fuel Production	2,566	2,858	2,934	2,951	2,914	2,534	3,041	2,914	4,339	3,214
>of which fossil-based synthetic	0	0	0	0	0	0	0	0	0	30
>of which biobased	2,566	2,858	2,934	2,951	2,914	2,534	3,041	2,914	4,311	3,184
>of which biobased cellulosic	0	0	25	25	38	40	30	20	0	20
Imports	5	15	0	27	687	890	24	1,035	104	100
Fuel Imports	5	3	0	26	477	871	8	759	0	100
Exports	43	45	40	33	25	34	135	79	21	800
Fuel Exports	8	7	2	2	0	1	3	35	7	0
Consumption	4,581	5,256	5,755	6,915	8,530	8,927	9,100	10,726	10,823	10,130
Fuel Consumption	2,563	2,854	2,932	2,975	3,391	3,404	3,046	3,638	4,332	3,314
Ending Stocks										
Fuel Ending Stocks	0	0	0	0	0	0	0	0	0	0
Refineries Producing First Generation, Bio-based Fuel Ethanol (Million Liters) 1/										
Number of Refineries	5	6	6	7	7	10	11	12	14	18
Nameplate Capacity	2,600	3,000	3,000	3,200	3,200	3,600	4,200	5,000	5,257	6,578
Capacity Use (%)	99%	95%	98%	92%	91%	70%	72%	58%	82%	49%
Refineries Producing Cellulosic Fuel Ethanol (Million Liters) 2/										
Number of Refineries	1	1	1	3	3	1	1	1	1	1
Nameplate Capacity	13	13	13	129	129	65	65	65	65	65
Capacity Use (%)	0%	0%	19%	19%	58%	62%	46%	31%	0%	31%
Co-product Production (1,000 MT)										
DDGs	1,909	2,102	2,107	2,121	2,003	1,628	1,628	1,455	3,224	2,348
Feedstock Use for Biomass-based Fuel Ethanol (1,000 MT)										
Corn Kernels	6,100	6,717	6,732	6,775	6,400	5,200	4,200	3,650	9,800	7,100
Wheat Kernels	0	0	0	0	0	0	1,000	1,000	500	400
Cassava (dried chips)	1,009	1,177	1,514	1,514	1,562	1,652	2,868	2,748	1,424	1,000
Rice (kernels)	0	0	0	0	0	0	0	500	500	500
Sweet Sorghum	0	71	71	71	0	0	0	0	0	0
Cellulosic Biomass	0	240	250	260	400	450	na	na	na	na
Market Penetration (Million Liters)										
Fuel Ethanol Use	2,563	2,854	2,932	2,975	3,391	3,404	3,046	3,638	4,332	3,014
Gasoline Use	105,738	113,592	130,019	135,837	157,487	164,957	172,111	173,661	180,826	181,715
Blend Rate (%)	2.4%	2.5%	2.3%	2.2%	2.2%	2.1%	1.8%	2.1%	2.4%	1.7%
Notes: f = forecast										
Corn kernels: 1 MT = 402 (before 2014) to 417 liters (after 2014)										
Wheat kernels: 1 MT = 393 liters										
Sorghum (Sweet) 1 MT = 430 (used in 2014 Baseline)										
Cassava (fresh root): 1 MT = 143 to 150 liters (25 to 35% starch content)										
Cassava (dried chips): 1 MT = 333 to 400 liters (15 to 65% starch content)										
Sources: Post estimates and industry sources										

On July 9, 2019, MIIT released Draft Revisions to “The Measures for Parallel Administration of Passenger Vehicle Enterprise Average Fuel Consumption and New-Energy Vehicle Credits.” MIIT proposes to raise the manufacturing quota of NEV targets from 2019 and 2020 targets to 14 percent, 16 percent and 18 percent in 2021-2023, and closer towards an ultimate target of 20 percent of total

automobiles in 2025. In this proposal, automakers that fall short of their quota are required to purchase credits from automakers that exceed their quota.

III. Ethanol

Overview

China is the world's fourth largest fuel ethanol producer after the United States, Brazil, and the European Union and is expected to fall to fifth position for consumption in 2020 (following 4th ranked Canada) if the expected drop in China is realized. China's ethanol market has mostly remained insular throughout its 20-year history. Imports were banned until 2015 and China rarely produced surplus volumes to export. As additional duties on U.S. origin imports were implemented in early 2018, China's fuel ethanol market again retreated from the global market.

China produces a broad variety of ethanol products at the commercial-scale covering potable alcohol, medical grade, other industrial chemicals, as well as fuel ethanol. Unlike other major ethanol producing countries, China's major end use market is non-fuel industrial chemicals and not fuel ethanol.

In the wake of suspending plans to expand E10 nationwide, the coronavirus pandemic took center stage in 2020. Record low international petroleum prices further dampened oil companies' willingness to blend fuel ethanol into gasoline. High corn feedstock prices pushed up fuel ethanol's production cost, resulting in ethanol prices exceeding gasoline prices. In addition, COVID-19 significantly lowered fuel consumption due to travel bans and reduced ethanol production as some producers shifted to producing 70 percent alcohol for use as a disinfectant.

Consumption

In 2020, fuel ethanol consumption is estimated at 3.014 billion liters (2.4 million tons), down 1.318 billion liters (1 million tons) from 2019 due to the E10 suspension and the impact of the COVID-19 epidemic.

Record low petroleum prices enabled domestic gasoline #95 prices to dip below fuel ethanol prices starting in March. MTBE competes with ethanol as a gasoline oxygenate. MTBE prices have dropped way below fuel ethanol prices throughout 2020. As a result, China's 2020 national fuel ethanol blend rate is forecast at 1.7 percent, down from an average 2.4 percent 2019, and lower than the peak blend rate level of 2.8 percent achieved 10 years ago. China does not produce ethanol-containing bio-ETBE (ethyl tert-butyl ether) in commercial volumes. Fuel blending formulations incorporating ETBE require additional processing, which have not been adopted in China.

Production

2020 fuel ethanol production is forecast to decrease to 3.214 billion liters (2.5 million tons), down 1.097 billion liters (0.9 million tons). In China, fuel ethanol prices are fixed at 91.1 percent of the retail gasoline price, which is set by NDRC according to a basket of global benchmark crude prices. However, with record low international oil prices, lower domestic gasoline consumption, and four-year record high domestic corn prices, fuel ethanol plant operation rates dropped 68% in January 2020 compared to the previous year, and then partially recovered to 36% lower in May compared to the previous year. Despite the fact that the plants are likely running at negative (or near negative) margins, industry sources report that 4 additional facilities could begin production this year in addition to facilities previously

approved. This would bring about 1.198 billion liters (945,000 tons) of capacity into production in 2020, raising the number of China’s licensed bio-based fuel ethanol processors to 19, and total production capacity to 6.578 billion liters (5.2 million tons). Ethanol projects including six corn-based, two syngas-based, and one cellulosic resumed construction in the first four months of 2020. In addition, three cellulosic fuel ethanol projects with 558 million liters (440,000 tons) capacity are seeking investors in Jilin province.

Industry sources reported that 87 percent of China’s fuel ethanol production capacity was corn-based, 11 percent was cassava-based and sugar cane-based. In 2018 and 2019, essentially all fuel ethanol expansion was attributed to higher production from China’s 8 major corn-based ethanol production facilities.

Industry sources report that sugar- and molasses-based ethanol producers remain under pressure to market their products for industrial and pharmaceutical use. Due to limited supplies of sugarcane and industry-lagging productivity, the margins for fuel ethanol production are too low.

Industry reports at least eight new ethanol production facilities are planned which could add up to 2.8 billion liters in new production capacity, if completed.

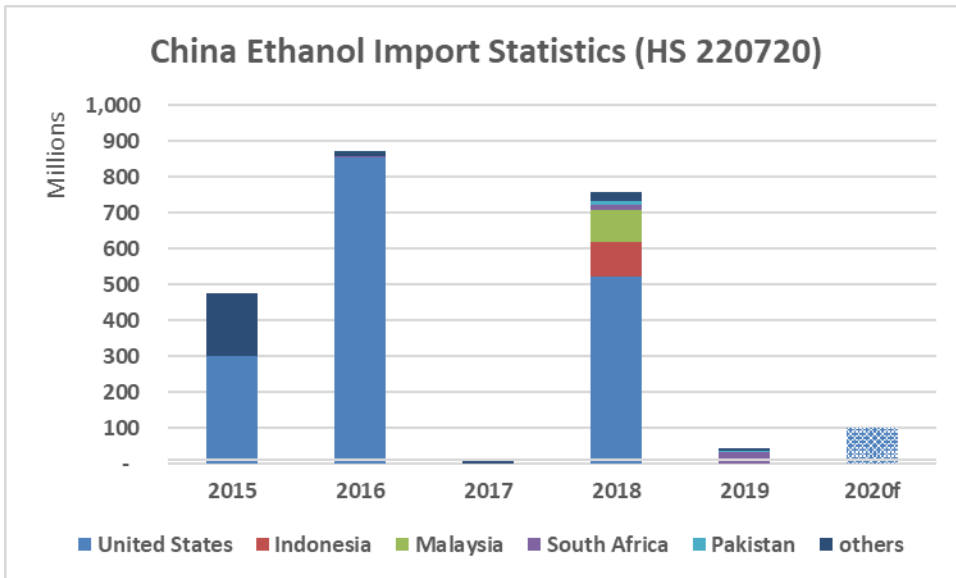
Production Capacity of China’s Fuel Ethanol Licensed Producers (2020 estimates)			
	Producers	Production Capacity	Feedstock
1	SDIC Jilin Alcohol	887 million liters (700,000 tons)	Corn
2	Henan Tianguan	887 million liters (700,000 tons)	Wheat, Corn, Cassava
3	COFCO Biochemical (Anhui)	798 million liters (630,000 tons)	Corn, Cassava
4	COFCO Bioenergy (Zhaodong)	507 million liters (400,000 tons)	Corn
5	SDIC (Zhanjiang)	190 million liters (150,000 tons)	Cassava
6	Shandong Longlive	65 million liters (51,300 tons)	Corn Cob
7	COFCO Bioenergy (Guangxi)	253 million liters (200,000 tons)	Cassava
8	Zonergy (Inner Mongolia)	38 million liters (30,000 tons)	Sweet Sorghum
9	SDIC (Tieling)	380 million liters (300,000 tons)	Corn
10	Liaoyuan Jufeng Biochemical	380 million liters (300,000 tons)	Corn
11	Jilin Boda Biochemistry	507 million liters (400,000 tons)	Corn
12	Jiangsu Lianhai Biotechnology	152 million liters (120,000 tons)	Corn
13	Shandong Fu’en Biochemical	152 million liters (120,000 tons)	Cassava
14	Jiangxi Yufan	127 million liters (100,000 tons)	Cassava
15	Shougang Lanza Tech	58 million liters (46,000 tons)	Synthetic Gas
16	SDIC (Hailun)	380 million liters (300,000 tons)	Corn
17	Wanli Runda	380 million liters (300,000 tons)	Corn
18	Hongzhan (Huanan)	380 million liters (300,000 tons)	Corn
19	Ningxia Shougang Lanza Jiyuan	57 million liters (45,000 tons)	Synthetic Gas
	TOTAL	6,578 million liters (5.2 million tons)	

Source: Industry Sources

Trade

2020 fuel ethanol imports are forecast at 100 million liters (789,00 tons), with limited shipments from the United States. If this level of imports is realized it would be sharply lower than in recent years when

duties on U.S. product were lower and China’s domestic consumption was higher. From January to May 2020, trade data indicates that China imported a mere 44.4 million liters (35,043 tons) of denatured ethanol, 9 million liters of which are reported as direct imports from the United States.



Sources: Trade Data Monitor, General Administration of China Customs, and FAS China estimates

Looking at the recent history of China’s denatured ethanol (220720) imports, nearly all of which has come from the United States since 2016 and is used as fuel ethanol, we note the following: China first allowed some test shipments of U.S. fuel quality ethanol in 2015 which turned into commercial trade in 2016 at the prevailing applied MFN duty rate of 5 percent. Starting January 1, 2017, China increased tariffs on all fuel (denatured) ethanol to the WTO MFN bound rate of 30 percent which immediately shut off trade from January thru October 2017 well before the retaliatory tariffs were put in place. Trade resumed in November 2017 as U.S. ethanol prices reached a 12-year low and continued thru March 2018. Retaliatory tariffs on U.S. fuel ethanol were imposed in April 2018 which raised the duty to 45 percent immediately choking off all trade, then three months later duties on U.S. product were raised further to 70 percent. In the second half of 2018, media reports chronicled how Malaysia and Indonesia shipped an estimated 100 to 150 million tons of ethanol to China, taking advantage of duty-free market access for ASEAN ethanol exports to China.

2020 fuel ethanol exports are forecast at 300 million liters. In the first five months of 2020, China already exported 264 million liters of denatured ethanol mostly to South Korea, while the exports in previous years were close to zero. With domestic consumption recovering, fuel ethanol supply is expected to meet domestic market demand for the rest of this year.

IV. Biodiesel

Overview

Increasingly stringent environmental measures are driving prospects for expanded biodiesel use in China. Based on fuel use, a modest B5 mandate for on-road use alone would currently require 6.807 billion liters (See the Biodiesel Table below). Beyond that, the potential is greater still, as China’s biodiesel applications also include off-road maritime and other non-transport sectors. However,

suffering from inadequate support, nationwide consumption remains stagnant with annual sales near 800-900 million liters when there is no discretionary demand.

With only a few tax breaks (insufficient to build the market alone) and seemingly no prospects for other financial incentives or blending mandates, China's biodiesel market will remain extremely limited, unable to compete with typically lower priced fossil-based diesel. China's periodic expansions in biodiesel production, imports and consumption followed by collapses highlight periods of discretionary (non-mandate driven) demand when the spread between palm oil (generally the cheapest biodiesel feedstock) and fossil diesel lowers the unsupported price of biodiesel below fossil diesel. China has seen solid growth in its exports of biodiesel since 2016 driven by demand for waste-based biodiesel in Europe which is incentivized under the EU's Renewable Energy Directive and supported by a 70 percent VAT rebate.

With crude oil prices slumped to a record low in 2020 due to COVID-19's impact on transportation and the collapse of discretionary demand after October 2019, Chinese domestic demand for biodiesel is estimated to fall year-over-year in 2020.

Biodiesel (Million Liters)										
Calendar Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020f
Beginning Stocks	0	0	0	0	0	0	0	0	0	0
Production	738	927	1,079	1,133	787	909	1,043	834	939	1,455
Imports	0	49	895	1,028	33	8	18	853	953	60
Exports	0	0	0	43	27	76	194	357	752	715
Consumption	738	976	1,974	2,118	793	841	867	1,330	1,140	800
Ending Stocks	0	0	0	0	0	0	0	0	0	0
Production Capacity (Million Liters)										
Number of Biorefineries	49	52	53	53	53	48	46	44	40	42
Nameplate Capacity	3,400	3,600	4,000	4,000	4,000	2,680	2,680	2,680	2,680	2,726
Capacity Use (%)	21.7%	25.8%	27.0%	28.3%	19.7%	33.9%	38.9%	31.1%	35.0%	53.4%
Feedstock Use for Fuel (1,000 MT)										
Used Cooking Oil	722	907	1,055	1,108	771	891	1,022	816	918	943
Market Penetration (Million Liters)										
Biodiesel, on-road use	221	270	324	340	236	273	313	410	430	250
Diesel, on-road use	121,479	131,797	133,383	133,365	134,375	130,564	130,538	126,898	135,370	136,149
Blend Rate (%)	0.2%	0.2%	0.2%	0.3%	0.2%	0.2%	0.2%	0.3%	0.3%	0.2%
Diesel, total use	186,890	202,765	205,205	205,177	206,730	200,868	200,828	195,228	208,262	209,460

Source: Post and Industry sources

Consumption

2020 biodiesel consumption is estimated at 800 million liters, down 340 million liters or 30 percent from 2019. This drop is due to fact that China's discretionary demand dropped off from October thru December 2019 and is essentially absent in 2020. In China, in contrast to most other countries, biodiesel is used to fuel electrical power generation, fishing vessels, and farm equipment. Industry sources report that on-road transport accounts for only about one-third of total biodiesel demand.

Currently, Shanghai is the only local authority implementing a biodiesel program. In October 2017, Sinopec Shanghai began offering B5 diesel at a \$0.05 per liter (0.3 yuan) discount to regular diesel as

part of a pilot program. The Shanghai program aims to buck a historical precedent where previous efforts to adopt local and provincial biodiesel blending mandates failed. Currently, Shanghai has established one blending center with annual distribution of B5 diesel of 400,000-600,000 tons (equivalent to 20,000-30,000 tons or 22.7-34 million liters of B100 biodiesel) to over 240 gas stations, which accounts for 41 percent of Sinopec Shanghai's total gas stations in the city.

Recent news reported that Sinopec and CNPC have started to purchase domestic biodiesel for exports, a signal that China's domestic biodiesel quality is recognized by State-Owned Enterprises (SOEs). Starting in April of this year, China's overall diesel consumption has recovered to pre-COVID-19 levels as the quick delivery e-commerce trucks and transportation trucks are back to normal operation.

Production

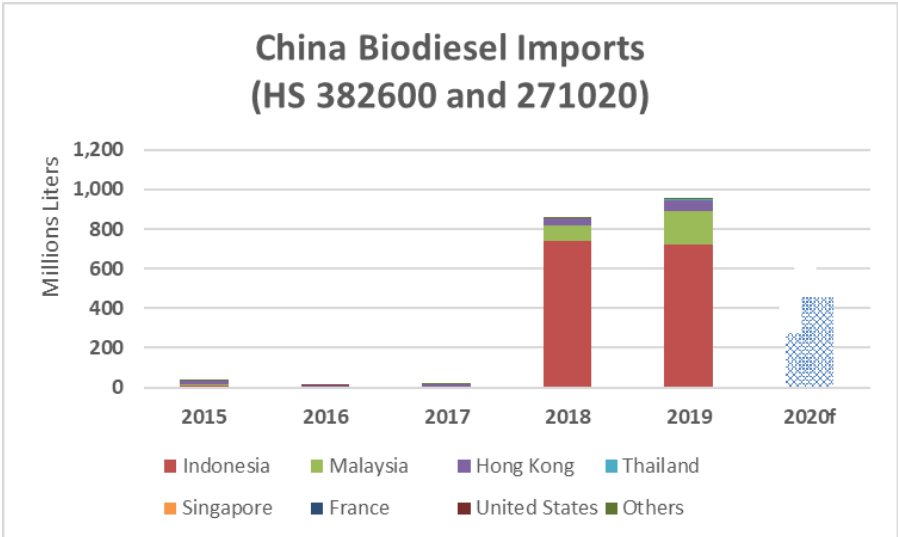
2020 biodiesel production is forecast at 1.455 billion liters, up by more than 54 percent from 2019 due to strong exports.

From its inception, China's biodiesel production plan has aimed to divert used cooking oil (UCO) away from food use and allay concerns about food safety. Nonetheless, China's biodiesel industry continues to wholly rely on UCO for feedstock. Some smaller food-grade oil brokers blend waste cooking oil, commonly known as "gutter oil," with food-grade oil to resell for restaurant use. Industry reports that China produced about 10 million tons of gutter oil in 2018, of which about 10 percent was used to produce biodiesel. About 0.97 tons of UCO can produce 1 ton of biodiesel. The COVID-19 epidemic greatly lowered the supply of UCO as much of the restaurant industry reduced or suspended operations. Acidified oil supply increased as Chinese families cooked meals at home which boosted production and consumption of edible oil. Plants that can accommodate acidified oil ingredients were able to keep up production.

According to the Chinese Academy of Sciences (CAS), China's biodiesel capacity in 2015 was between 3.420 to 3.990 billion liters (3 to 3.5 million tons). Industry sources report that many of China's largest biodiesel processors remain idle and capacity since 2016 – early 2016 was the time when oil prices fell to previous lows of under \$40/barrel pushing biodiesel production margins into negative territory – has likely remained near 2.7 billion liters with a capacity utilization rate a only one-third.

Trade

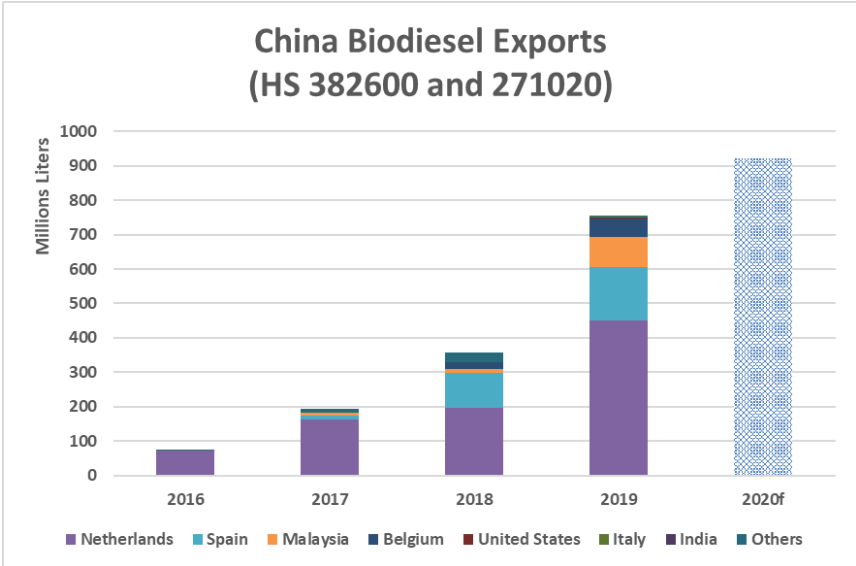
Biodiesel imports are forecast to decline to 60 million liters from 2019's level of 953 million liters, the highest imports since 2014. Industry sources report that more than 90 percent of the imports are palm oil-based biodiesel from Indonesia and Malaysia.



Sources: Trade Data Monitoring and General Administration of China Customs

2019 was a good year for China’s export-oriented biodiesel producers because of the EU’s strong demand. Industry reported average domestic biodiesel prices rose from about RM 35,000 per ton in January to over RMB7,000 per ton at year end. Before the COVID-19 outbreak in China, and crude oil prices plummeted as export prices for biodiesel hit RMB7,500-7,600 per ton, even RMB8,000 in some cases. Orders resumed in April in small batches. April exports totaled 129 million liters, increasing 62.5 percent month-on-month.

From January to May this year, China’s biodiesel exports have risen steeply by 75.8 percent year-on-year. The vast majority is shipped to the EU as EU policy incentivizes demand for waste-based biofuels. To date, COVID-19’s impact in the EU has had limited impact on China’s biodiesel exports. China’s exports only account for 3-5 percent of the EU’s biodiesel/ hydrogenation-derived renewable diesel demand. At least four top Chinese biodiesel producers reported continued exports to EU in February.



Sources: Trade Data Monitoring and General Administration of China Customs Note: All product trade under HS 3826.00 is assumed to be pure B100 biodiesel; All product under HS 271020 as petroleum oil, containing biodiesel up to 30 percent, is assumed to contain on average 10 percent biodiesel by volume, converted and reported as B100 equivalent.

V. Advanced Biofuels

Fuel ethanol in China is mainly produced from corn using conventional fermentation. However, the industry is investing significant resources to transition to cellulosic bioethanol as well as coal and industrial flue gas-based synthetic ethanol.

Cellulosic Ethanol

China biofuel policy defines Generation 2 Biofuels as those made from cellulosic biomass and algae. According to the 12th Five Year Plan (2011-2016) for strategic emerging industries, China aimed to use biomass energy sources to develop Generation 2 biofuels.

Cellulosic ethanol is prominently featured in the joint announcement by China's NDRC and other ministries in the September 2017 "Implementation Plan for the Expansion of Ethanol Production and Promotion for Transportation Fuel," but no production targets were included.

As in the United States and Europe, cellulosic ethanol projects in China have repeatedly failed to meet expectations and timelines for commercialization moved forward year after year. Cellulosic ethanol plants face logistics challenges to supply reliable volumes of feedstock at low cost and are far more expensive than conventional ethanol plants to build and operate. China's cellulosic ethanol industry, like those found elsewhere, face challenges including finding high levels of foreign matter in bales of stalks, straw, and stover, and optimizing the use of enzymes to convert cellulosic material to energy.

Bio-energy is commonly cited as a preferred option for the disposal of large volumes of crop residues in China to reduce field burning under uncontrolled conditions that result in wide spread air particulate matter pollution. China's estimated national crop straw and stalks resources are between 800 million tons and 1.1 billion tons. In 2015, corn stover was estimated to account for 225 million tons of China's annual production of crop residues. Jilin province reportedly produces 23 million tons alone. Each ton of corn as grain yields about 1.1 tons of corn straw residues, some of which must be left in the field to provide erosion control and other benefits.

In China, growers customarily either burn crop residues in the fields, or gather and bundle these residues to use as heating fuel for the winter. Since 1999, local authorities have announced strong enforcement measures to lower particulate matter emissions and air pollution and curb the practice. In 2017, MOF offered subsidies as high as \$1.5 million to \$3.0 million (10 to 20 million RMB) for each city and county pilot project to utilize straw as an energy feedstock. Qualified projects include procurement of stalk processing equipment, such as baling machines, straw and stalk-based bioenergy electrical power generation, and construction of straw and stalk buying points (receiving, grading, storage, and marketing). Farmers face cash penalties and detention if they fail to comply with burning rules. However, the economic cost of gathering and transporting biomass for cellulosic processing exceeds the subsidy value offered by local authorities. A recent economic study reported that straw collection is limited by low economies of scale, lack of public awareness, and limited access to equipment.

Sustainable Aviation Fuel (SAF)

In September 2012, Sinopec partnered with Airbus to develop a Chinese national standard “#1 bio-jet fuel,” based on proprietary processing technology at its Hangzhou refinery. In November 2017, Boeing and Sinopec partnered with China’s Hainan Airlines to power an 11,000 kilometer Boeing 787 Dreamliner flight using UCO-derived jet fuel. Hainan Airlines previously conducted a biofuels-based flight in 2015. In September 2019, Sinopec-led first aviation biofuel production equipment set entered the preparation stage for compressor testing, laying foundations for next step industrial production. Currently, there are no “off-take” agreements in China to supply commercial flights on a regular ongoing basis as there are in both North America and Europe where commercial sales are now rising. China lacks the policy support seen in California and Europe to jump start this new market.

Synthetic Fuel Ethanol

China’s efforts to reduce air particulate matter and other fossil fuel toxins include projects that convert coal and industrial waste gas into synthetic ethanol. At the same time, China’s adoption of more stringent environmental standards further constrains expansion of existing syngas-to-ethanol processing facilities.

In January 2017, China launched the world’s first coal-to-ethanol production facility in Shaanxi province. The Shaanxi Yanchang Petroleum facility has a single production line which converts coal to syngas and then into ethanol. The facility uses technology developed by CAS and Dalian Institute of Chemical Physics in Liaoning province to produce 99.17 percent anhydrous ethanol and is on track to expand annual production to 1.268 billion liters by 2021. Yanchang’s 634-million-liters-per-year synthetic fuel ethanol project is scheduled to begin production by the end of 2020.

In 2019, several non-fuel, industrial chemical ethanol producers in Jiangsu province that use coal and synthetic fermentation technology closed in the wake of weakening demand for industrial chemicals, and the implementation new environmental and safety requirements. Currently, one 58-million-liter-per-year fuel ethanol facility in Hebei is under operation and another 57-million-liter-per-year production line is under construction, scheduled to start operation at the end of 2020 in Ningxia.

Annex I

China's Long March Towards National Biofuel Market Development: Production/Consumption Targets and Feedstock Priorities.

10th FYP (2001-2005) – Corn Surplus Period

China implemented fuel ethanol programs starting in the early 2000's in response to abundant grain supplies. In MY1998/99, USDA ending stocks estimates reached record highs at 123.8 million tons. During these early years, the vast majority of domestic ethanol production relied on existing corn surpluses. Beginning 2005, as global grain prices soared, the China began its initial promotion of non-grain, conventional fuel ethanol production known as Generation 1.5 ethanol.

11th FYP (2006-2010) – Corn Surplus Moderated

China's 11th Five-Year Plan (2006-2011) was the first targeting the production of biofuel from non-grain materials, including sweet sorghum, potatoes, and cassava for ethanol, and jatropha trees for biodiesel. (See Section VI, Advanced Biofuels).

Beginning in 2006, 11 provinces (Heilongjiang, Henan, Jilin, Liaoning, Anhui, Guangxi, Hebei, Shandong, Jiangsu, Inner Mongolia and Hubei) were selected as pilot zones for fuel ethanol production and mandatory E10 blend use. Many fuel retailers have argued in courts and protested against state-owned petroleum giants that China's implementation of biofuels blending targets restrict their ability to respond to market prices, undercutting their profitability and the long-term sustainability of their businesses. As a result of these concerns, some regions do not strictly enforce province-wide E10 blending requirements.

In August 2007, NDRC published a "Mid- to Long-term Renewable Energy Development Plan" that targets annual fuel ethanol use to exceed 12.670 billion liters (10 million tons) by 2020, effectively expanding production by five-fold from 2017 to 2020.

During a period of high corn prices in 2008, China restricted construction of new ethanol facilities. Starting in 2010, central government subsidies for conventional ethanol plants began to be phased out, falling from \$0.03 per Liter (RMB 2,000 per ton) in 2009 to zero in 2016. Ethanol production subsidies using non-food grain feedstocks were also phased out by 2018. Afterwards, China limited the growth of corn use for fuel ethanol when rising domestic grain prices triggered food price concerns. During this same period, China became a net corn importer.

12th FYP (2011-2016) – Corn Surplus Period

In 2010, the government set ambitious targets for ethanol and biodiesel in its 12th FYP, including a goal of producing 5.068 billion liters (4.0 million tons) of fuel ethanol and 1.136 billion liters (1.0 million tons) of biodiesel by 2015.

Despite significant investments in research and development, government efforts to expand production of non-grain conventional fuel ethanol never materialized into commercial-scale projects. (See Section VI, Advanced Biofuels).

The 12th FYP goal for biodiesel was met early in 2014. However, both biofuel production targets fell short in 2015. In 2015, fuel ethanol production reached just 2.914 billion liters (2.3 million tons), or less than two-thirds of the original 5.068 billion liter (4.0 million ton) 12th FYP goal.

13th FYP (2016-2020) – Corn Stocks Drawdown

On October 24, 2016, China’s State Council announced its 13th FYP goal to produce 5.068 billion liters (4 million tons) of ethanol and 2.272 billion liters (2.0 million tons) of biodiesel by 2020. While the goal requires ethanol production to rise four-fold from 2016 levels. Underlying economic fundamentals and the lack of national or provincial government support undermine large-scale efforts to expand production.

Government policies introduced in 2016 paved the way for a fuel ethanol industry revival through the elimination of the temporary reserve policy for corn; and the reinstatement of the VAT refund on ethanol products. Industry sources report that China’s provincial corn processing subsidies and a nationwide effort to expand E10 are supporting margins for ethanol producers.

On September 13, 2017, NDRC, NEA, Ministry of Finance (MOF) and 12 other ministries jointly announced a plan to expand ethanol production and promotion for transportation fuel. This includes a nationwide target of implementing 10-percent ethanol blending into gasoline fuel by 2020, and a proposed shift to commercial-scale cellulosic ethanol by 2025. To date, the Government of China has not proposed a volumetric target for commercial-scale cellulosic ethanol production. On August 22, 2018, Chinese Premier Li Keqiang addressed China’s State Council, and reiterated the central government’s commitment to expand ethanol use nationwide.

In December 2019, media reported that China will suspend the expansion of its E10 mandate, essentially confining it to where it had already been introduced as corn stocks were too low and ethanol production capacity too small to implement E10 properly nationwide.

Attachments:

No Attachments