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Report Highlights:

China maintained low ethanol blending rates while biofuel production shifted dramatically in 2025. Biodiesel exports collapsed due to EU anti-dumping duties, forcing producers to pivot toward sustainable aviation fuel production instead. Electric vehicle adoption reduced domestic fuel ethanol demand, while synthetic ethanol production from coal doubled. China is positioning itself as a major sustainable aviation fuel exporter with significant new production capacity coming online.

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I. Executive Summary

FAS China provides this analysis and reporting as a service to the United States agricultural community, and to our farmers, ranchers, rural communities, and agribusiness operations in support of a worldwide agricultural information system and a level playing field for U.S. agriculture.

China’s biofuels policies, first established over two decades ago primarily as a corn surplus disposal mechanism, have evolved into a largely export-oriented industry, while domestic consumption remains minimal. Despite ambitious renewable energy goals tied to China's dual carbon targets of peak emissions by 2030 and carbon neutrality by 2060, the domestic biofuels market shows clear signs of stagnation with no meaningful progress toward higher blending mandates or carbon intensity reductions.

China's national average ethanol blend rate remains at approximately 2.1 percent in 2025, far below the E10 mandate announced in 2017 for nationwide implementation by 2020. Only 15 provinces maintain E10 mandates, with no expansion since 2019. Fuel ethanol consumption is forecast at 4.3 billion liters in 2025, down 11 percent from 2024, primarily due to declining gasoline consumption driven by rapid electric vehicle adoption. The government has effectively abandoned the nationwide E10 goal, with policy messaging shifting from "moderate development" in 2017 to "strict control" of corn-based ethanol expansion since 2020.

Domestic biodiesel consumption remains minimal at 750 million liters in 2025, with Shanghai being the only municipality maintaining a B5 mandate. The biodiesel industry is overwhelmingly export-focused, with approximately 80 percent of production destined for the EU until recent anti-dumping measures disrupted this trade flow. As the only growing segment, industry expects sustainable aviation fuel (SAF) consumption to reach 62.5 million liters by the end of 2025, meeting the 14th Five-Year Plan target. However, with production capacity projected at 3 to 3.8 billion liters, the industry remains export-oriented due to limited domestic demand.

The biofuels industry relies primarily on grain-based feedstocks for ethanol production, with 75 percent coming from corn, wheat, and rice and 10 percent from cassava or sugarcane. The remainder comes from industrial waste gases and limited cellulosic sources. Biodiesel and renewable diesel production depend almost exclusively on used cooking oil (UCO), with China collecting approximately 5.2 billion liters annually, of which 3.3 billion liters were used for BBD production in 2024. An emerging topic is the rapid growth of coal-based synthetic ethanol production, which doubled to 1.2 billion liters in 2024, with 436 million liters of that for fuel use.

Recent trade developments have significantly impacted China's biofuels sector. The EU imposed anti-dumping duties ranging from 10 percent to 35.6 percent on biomass-based diesel from China in 2025, causing production to plummet 30 percent year-on-year. Past tariff measures have effectively shut down ethanol imports from the United States. China's cancellation of export tax rebates for UCO in November 2024 signals Beijing's attempt to retain feedstock for domestic processing. Meanwhile, the launch of a SAF export pilot program in April 2025 positions China to become a major SAF exporter.

Despite rhetoric about environmental goals, China's actual biofuels policy implementation reveals clear economic priorities. The shift from promoting to restricting corn-based ethanol production directly correlates with corn stock levels and prices rather than emissions targets. The industry's export orientation, particularly for biodiesel and emerging SAF production, demonstrates a focus on economic returns over domestic decarbonization. The lack of meaningful support for domestic biofuel consumption while aggressively promoting electric vehicles indicates a strategic choice to pursue transportation decarbonization through electrification rather than liquid biofuels. High import tariffs on foreign biofuels and feedstocks combined with minimal domestic consumption mandates protect nascent industries without forcing significant domestic market development.

China's biofuels program exhibits clear signs of stagnation. There has been no expansion of E10 mandate areas since 2019 and no implementation of effective carbon intensity reduction mechanisms. China has not established sustainability criteria or lifecycle emissions standards for biofuels. Despite decades of investment, no commercial-scale cellulosic ethanol production has materialized. Comprehensive blending infrastructure remains absent beyond pilot areas, and biofuels remain excluded from benefits under China's emissions trading system.

China's biofuels program is driven mostly by policy rhetoric rather than implementation reality. While official documents promote biofuels for environmental benefits, actual practice reveals a program driven by agricultural commodity management and export revenues. The domestic market remains largely undeveloped despite significant production capacity, suggesting that China has chosen alternative pathways, primarily vehicle electrification, to achieve its transportation decarbonization goals. Without fundamental policy reforms, including mandatory blending enforcement, carbon intensity standards, and domestic market incentives, China's biofuels sector will likely remain export-dependent and play a minimal role in the country's carbon neutrality ambitions.

II. Policy and Programs

General Policies

On April 25, 2025, China's Ministry of Transport and nine other departments published the Guiding Opinions on Promoting the Integrated Development of Transportation and Energy. The guidance aims to accelerate the development and utilization of "clean" energy in transportation infrastructure, to promote the "green" and low-carbon substitutes in transportation, and to guarantee such energy in transportation. The guiding opinions also ask to: (1) advance the application of new low-emission, low-fuel-consumption diesel locomotives; (2) support the development and promotion of ships powered by "new and clean" energy sources and the use of energy options such as biodiesel in ships; (3) promote the application and development of "new energy aircraft"; (4) promote the use of sustainable aviation fuels (SAF) for air postal transport; (5) boost the supply capacity for aviation biofuels; and, (6) improve the storage, transportation, and refueling network for biofuels. The guidance did not announce a mandate.

The Standing Committee of the 14th National People's Congress passed the Energy Law of the People's Republic of China that took effect on January 1, 2025. The law explicitly aims to

support China's dual carbon goals, such as peaking carbon emissions and achieving carbon neutrality, by promoting green, low-carbon, and sustainable economic and social development. The law emphasizes prioritizing renewable energy, greening both energy production and consumption, and calls for establishing a new mechanism to transition from controlling total energy consumption and intensity to controlling total carbon emissions and intensity, thus providing a legal foundation for this transformation.

In May 2022, the National Development and Reform Commission (NDRC) issued the 14th Five-Year Plan (2021-2025) for Bioeconomic Development, which established a national biotechnology framework to boost the bio-economy over the next five years. This plan calls on stakeholders to:

- actively develop bioenergy, promote the development of biofuels, and support the integrated development of the biochemical industry;
- establish biomass combustion and blending standards;
- accelerate the key technology development and equipment manufacturing regarding bionatural gas, cellulosic ethanol, and algae-based biofuels;
- actively promote the replacement, promotion and usage of advanced biofuels in municipal operation, transportation, and other important areas;
- promote the transformation of fossil energy to green, low-carbon, and renewable energy.
- implement demonstrations of cellulosic ethanol, biodiesel, and biogas industries pilots in urban and rural areas where organic waste is concentrated;
- enhance important links, such as biomass raw material collection and organic fertilizer production and use, and increase the scale of biofuel production; and,
- launch pilot projects for the promotion of biodiesel in suitable areas and demonstrate and apply bio jet fuel.

In May 2022, the NDRC led nine ministries to publish the "14th Five-Year-Plan for Renewable Energy" (See GAIN Report CH2022-0065). This plan advocates for the development of nongrain biofuel ethanol, such as cellulosic biofuel, although this has been a long-standing announced goal that has led to no large-scale commercial industry. The plan encourages demonstration pilots of alcohol, electricity, gas, and fertilizer production. This plan also encourages the promotion of clean liquid fuels, such as fuel ethanol and biodiesel, although this is more of a reiteration of previous statements rather than a new initiative. Additionally, this plan supports research and development and the promotion of advanced technology and equipment in biodiesel and jet fuel. However, Beijing did not announce detailed implementation measures or policies following the release of the two plans.

A. ***Renewable Energy and GHG Emissions***

At the Climate Ambition Summit in December 2020, President Xi committed China to reducing its carbon dioxide emissions per unit of GDP by over 65 percent from its 2005 level. He also pledged to increase the share of non-fossil fuels in primary energy consumption to 25 percent by 2030, aligning with the goal of peak carbon dioxide emissions by 2030.

In June 2024, the National Energy Administration (NEA) launched the Coal Decarbonization Retrofit Action Plan 2024-2027, which aims to cut emissions from "low carbon" coal plants 50

percent by 2027. The plan includes co-firing with ammonia and biofuels, as well as deploying carbon capture technology.

On May 23, 2024, the State Council unveiled a new Action Plan for Energy Conservation and Carbon Emissions Reduction spanning from 2024 to 2025. This initiative aims to reinforce energy conservation and carbon emissions reduction objectives, particularly as China approaches the final stretch of the 14th Five-Year Plan period (2021 to 2025). The conclusion of this period also signifies the midpoint toward China's first climate goal of achieving peak carbon emissions by 2030. The headline target is for the proportion of non-fossil fuel power generation to reach about 39 percent by the end of 2025. By the end of 2022, China's proportion of non-fossil energy power generation reached 36.2 percent. The plan calls for increasing non-fossil fuel energy consumption and promotes the use of advanced bio-liquid fuels and SAF.

China launched an emissions trading system (ETS) on July 16, 2021. On 20 March 2025, the Ministry of Ecology and Environment (MEE) of China released a work plan to expand the sectoral coverage of the national ETS to cover both energy-related and process emissions from the cement, steel, and aluminum smelter sectors. For the compliance year of 2024, covered entities will receive free allowance equal to their verified emissions. For the compliance years of 2025 and 2026, the allocation method will be output-based and intensity-controlled. The surplus and shortage would be roughly the same within one sector. Biofuels could benefit from the carbon trading system if China Certified Emission Reductions (CCER) approves biofuels for carbon trade. This approval would add value to biofuels in the carbon market, support biofuel producers, and make the use of biofuel-blended gasoline more economical than traditional gasoline. For information on China's energy intensity reduction goals as well as the Energy Development Strategy Action Plan published in November 2015, the Blue Sky Protection Plan issued in July 2018, and China's Vehicle Emissions Standards, please see the 2021 and 2020 Annual Biofuels Reports.

China's biofuels policy has never, nor does it today, set minimum environmental sustainability performance criteria related to water, soil, or air. There are no maximum boundaries set on biofuel GHG emissions (ge/MJ) nor any certification requirements. Also, China does not permit foreign authorities' on-site access to certify biofuels shipped to them. In the absence of such policies and requirements, China fails to provide incentives for GHG emissions reductions in existing commercialized fuels, unlike U.S. West Coast states (and U.S. federal tax credit policies), Brazil, European countries, and Canada.

There are also ongoing widespread concerns about the risk of mislabeled traded product, due to EU, UK, and U.S. policies that favor biofuel feedstocks and biofuels with lower carbon intensity values. For example, there have been concerns EU and U.S. imports of product from China labeled as UCO may contain palm oil. Similarly, industry reports that EU imports of biomass-based diesel (BBD) from China certified as "UCO-based" may be wholly or partly made from palm oil.

B. Policy & Programs Aimed Specifically at Biofuels or More generally Fuel Pool Size Which Also Impact Biofuel Demand

Fuel Ethanol Policy Framework and Mandates

China 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 licenses for fuel production, refining, and marketing. (See Section III. Ethanol Production).

China has been a leading Methyl Tertiary Butyl Ether (MTBE) producer and consumer globally since 2013. China's MTBE production capacity is estimated at 25 billion liters. MTBE is considered as an important high-octane component in gasoline in China, with an average blending rate of 8 percent in China's gasoline usage.

On April 30, 2025, NDRC and Ministry of Commerce (MOFCOM) jointly released the Market Access Negative List, which sets investment restrictions on certain projects. The Negative List specifically discourages investment in fuel ethanol production by setting the restriction that "all fuel ethanol investment is subject to provincial government verification and approval." This is a further signal that investments in expanding China's fuel ethanol production capacity are unlikely in the short to near term.

In March 2024, NEA published a 2024 Energy Work Guidance. The guidance reinforces the country will steadily advance the development of green and clean liquid fuels and promotes technological innovation and industrialization of non-grain fuel ethanol, such as cellulosic ethanol, in an orderly manner.

In February 2022, the State Council released its annual policy guidelines on agriculture and rural development known as the "Number 1 Document," which instructed officials to "strictly control the corn-based fuel ethanol processing industry." (See also GAIN Report CH2023-0026 and CH2022-0029.) This likely indicates that corn-based ethanol production will remain at current capacity for the foreseeable future. Ethanol was not mentioned in the 2023 and 2024 Number 1 Document, an omission which again seems to indicate that it is no longer a priority issue, which Beijing officials have also noted to Post.

In 2017, Beijing's messaging called for the moderate development of grain-based fuel ethanol and an E10 mandate. However, by 2020, the focus had shifted to the "strict control of the expansion of fuel ethanol processing capacity." This shift is reminiscent of 2008 when China, facing reduced surpluses and high corn prices following a phase of corn ethanol expansion, restricted the construction of new ethanol facilities. In 2022, the messaging was repeated, emphasizing the need to "strictly control the corn-based fuel ethanol processing industry." This shift from 2017 to 2020, and its reinforcement in 2022, illustrates the gradual transition away from the original first-ever push for E10 nationwide. That said, China will maintain E10 mandates in provinces and municipalities that have fully or partially adopted E10, while quietly postponing (and likely eventually dropping altogether) any expansions of nationwide E10. Meanwhile, China's gasoline pool, which includes bioethanol, biomethanol, and Ethyl TertButyl

Ether (ETBE), is estimated at 203 billion liters by the International Energy Agency in 2025, falling to nearly the 2019 pre-pandemic level of 198 billion liters. The current estimated national average blend rate of 2 percent has also returned to 2019 level.

Table 1. China: Current E10 Mandate Area

Province	Status
Henan	2002 Pilot in three cities 2004 province wide E10 mandate
Heilongjiang	2002 Pilot in two cities 2004 province wide E10 mandate
Jilin	2004 province wide E10 mandate
Liaoning	2004 province wide E10 mandate
Anhui	2005 province wide E10 mandate
Guangxi	2008 province wide E10 mandate
Hebei	2005 pilot in six cities 2019 province wide E10 mandate
Shandong	2006 pilot in seven cities 2016 province wide E10 mandate
Jiangsu	2005 pilot in five cities
Hubei	2005 pilot in nine cities
Inner-Mongolia	2014 pilot in three cities, now suspended
Guangdong	2016 pilot in four cities, now suspended
Tianjin	2018 city wide E10 mandate
Shanxi	E10 pilot in some cities announced in 2019; not realized.
Shanghai	Planned to launch E10 in 2019; not realized.

Source: Chinese government agencies.

E10 is Unachievable in the Short Term, Even More So Long-Term

Post forecasts that China will produce 4.3 billion liters of fuel ethanol and, with virtually no trade, consume the same amount in 2025 – 11 percent lower than 2024 production and consumption levels. The International Energy Agency's projection of China gasoline consumption in 2025 is down by 4 percent from 2024. However, government agencies in charge of E10 are paying increased attention to localities with existing E10 pilots with expectations that they will meet their full blend mandate. Consequently, pilot areas that did not strictly follow the mandate during the COVID period have increased blending, despite no increase to the pilot areas. Stagnant policy and limited surplus grain stocks continue to limit fuel ethanol consumption, keeping the average blend rate largely unchanged.

If China were to fully implement a national E10 blending program, based on the International Energy Agency's and NEA's figures, it would need to consume about 20 billion liters of fuel ethanol in 2025 – four times greater than actual consumption. Even if all existing approved fuel ethanol projects begin operation in 2025, the total output would only allow an E4 blend rate. However, this assumes that China's corn stocks could support expanded production. Water

scarcity and extreme weather, including widespread floods, drought, and periods of high heat, pose further challenges. It seems equally unlikely that a program will be fully implemented in the current political climate considering China's frequent emphasis on the importance of agricultural self-sufficiency. In addition, 64 percent of China's fuel ethanol production capacity is concentrated in the Northeast, while most gasoline consumption areas are in the South, and it remains cost restrictive or unfeasible without greater subsidy to transport fuel ethanol from production areas to consumption regions. The assumption here is that cellulosic ethanol will likely not achieve cost breakthroughs needed to realize large-scale commercial production that could make a meaningful and growing contribution to overall supply.

For more historical information on blend mandates, please see the 2020 Biofuels Report.

Government Financial Support for Biofuel Production

Past China government subsidies for fuel ethanol production supported both feedstocks and production inputs to make the industry viable. Starting in 2009, central government production subsidies for grain-based conventional ethanol were as high as $0.25/liter, but Beijing eliminated them in 2016. From 2016 to 2018, provinces in Northeast China offered corn processors and ethanol facilities generous subsidies. Provincial authorities have not renewed processing subsidies since 2019 as government commitment to supporting the biofuels industry has waned with corn stocks depleted. The advanced cellulosic ethanol production subsidy was set at $0.07/liter in 2018, and there have been no additional announcements or updates to the original subsidy program. Such a low subsidy remains ineffective in incentivizing the building of an industry. China is unlikely to reintroduce support for corn until significant oversupplies return.

On November 13, 2023, NEA solicited proposals through its *Notice on Organizing Pilot Demonstrations for the Promotion and Application of BBD* (GAIN report GH2024-0030) encouraging governments at all levels, enterprises, and other entities to apply for biodiesel pilot demonstration projects for the promotion and application of BBD. On March 29, 2024, the NEA issued the *Notice of the General Office of the National Energy Administration on Publicizing the Pilot Projects for the Promotion and Application of BBD* (GAIN report CH2024-0065) announcing the selected pilot projects. NEA will support eligible pilot demonstration projects by providing mid-to-long term loans and promote the inclusion of biodiesel into the national Certified Voluntary Emission Reduction (CCER) mechanism and accelerate the realization of the green value of biodiesel. The domestic industry sees these projects to develop the domestic BBD industry and enhance market confidence, especially following the escalation of EU and China's BBD trade dispute.

On April 24, 2025, NEA published a notice on Organizing Technological Breakthroughs and Industrialization Pilots for Green Liquid Fuels (Document No. [2025] 43). Organizations may apply for pilot projects in the following areas:

- SAF: Produced from biomass, bio-ethanol, green methanol, CO_2, and renewable hydrogen via processes like gasification, hydrogenation, and catalytic synthesis.
- Sustainable Diesel: Similar feedstocks and processes as SAF, targeting diesel components.

- Biofuel Ethanol: Biomass-based ethanol production via fermentation.
- Green Methanol: From biomass, biogenic CO_2, renewable hydrogen, and biogas via synthesis.
- Green Ammonia: Produced from renewable hydrogen and nitrogen via catalytic synthesis.

Eligible projects will receive priority in manufacturing loans, enjoy key national projects support, and series of policy support.

On July 14, 2025, the People's Bank of China, the National Financial Regulatory Administration, and the China Securities Regulatory Commission jointly issued the Green Finance Support Project Catalogue (2025 Edition). This catalogue outlines comprehensive financial support policies for the entire biofuel value chain, ushering in an unprecedented wave of green finance for the industry. The catalogue grants the biodiesel and SAF industries strategic importance within China. The application scenarios for biofuels are clearly defined, and aircraft manufacturers applying SAF are now eligible for green financial support.

Biodiesel Policy Framework and Mandates

China's biodiesel policy has evolved significantly in recent years, driven by goals related to energy security, carbon reduction, and the circular economy. China's biodiesel industry is export-led, policy-supported, and increasingly linked to SAF development. While domestic consumption remains limited, green finance, capacity expansions, and global low-carbon fuel mandates continue to drive growth. China has issued several policies to encourage BBD consumption transition from export-oriented to domestic-oriented. (see IV. Biodiesel/Renewable Diesel for more information).

Table 2. China: Major BBD Policies

Time	Issuing Department	Policy	Main Content
November 2024	Ministry of Finance & State Taxation Administration	Announcement on Export Tax Rebate Adjustment	Industrial Used Cooking Oil (UCO), a key SAF feedstock, removed from export rebate list.
October 2024	NDRC, MIIT, Ministry of Housing, Ministry of Transport, NEA, Data Bureau	Guiding Opinions on Promoting Renewable Energy Substitution	Develop green fuels like biogas, biodiesel, and bio-jet fuel.
July 2024	State Council	Work Plan for Establishing a Dual Carbon Emission Control System	Improve carbon accounting mechanisms in key sectors including transport.
November 2023	NEA	Notice on Organizing Pilot Demonstrations for the Promotion and Application of BBD	Encourage pilot demonstration projects for the promotion and application of BBD
June 2022	NDRC & NEA	14th Five-Year Plan for Renewable Energy Development	Promote commercialization of clean liquid fuels
May 2022	NDRC	14th Five-Year Plan for Bio-Economy Development	Encourage biodiesel pilots in suitable regions

Source: Chinese government agencies.

Sustainable Aviation Fuel Policy

The Chinese government considers SAF a crucial part of its efforts to realize its carbon emissions goals. The country's SAF development started as early as 2009 when state-owned Petroleum & Chemical Corporation (Sinopec) launched SAF technology research and established its first ever SAF production line in 2013. Sinopec suspended the line in 2015 due to high costs. Following this setback, China has refocused and expedited its research and development. SAF plants have emerged quickly in recent years, especially after 2022. As the world's second largest domestic civil aviation market and as one of the largest destinations and source of international air travel, China's SAF market offers considerable opportunities. (see V. Advanced Biofuels for more information).

Additionally, China has chosen not to participate in the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), following a pattern observed across various

engagements with international standards bodies where the nation typically seeks customized allowances that account for factors such as historical emissions levels.

CAAC is currently developing its own domestic certification framework for SAF as part of broader green aviation initiatives, though it has not publicly announced a program specifically named the "China Sustainable Certification Scheme" (CSCS). This domestic approach aligns with China's strategy of maintaining sovereignty over its environmental regulations while still addressing carbon reduction goals.

China's relationship with CORSIA illustrates this selective engagement approach. As of 2025, China has not volunteered to participate in any of CORSIA's voluntary phases, having abstained from both the pilot phase (2021–2023) and the first phase (2024–2026). The scheme's three-phase structure progresses from voluntary participation in the pilot and first phases to mandatory participation for most states during the second phase (2027–2035), based on aviation activity levels.

Despite not participating in CORSIA's offsetting requirements, China is required to monitor its obligations as an ICAO member state. Looking toward 2027, China will face mandatory offsetting obligations during CORSIA's second phase unless it decides to join voluntarily beforehand, with these obligations determined by its significant aviation activity levels. China's domestic carbon intensity calculations employ a methodology that combines international standards with domestic approaches. The primary metric used is CO_2 emissions per metric ton-kilometer, measuring carbon dioxide emissions per metric ton of payload transported over one kilometer.

The fuel-based estimation method provides the foundation by calculating CO_2 emissions directly from aviation fuel consumption, utilizing the net heating value of jet fuel and established emissions factors. Flight phase modeling offers more granular analysis by examining emissions across different operational phases while considering aircraft type, flight distance, and specific operational data. This approach enables detailed assessment of individual routes and aircraft performance. Additionally, China utilizes the ICAO Carbon Emissions Calculator, which estimates emissions based on aircraft specifications, route distances, passenger load factors, and cargo weights.

These calculation methods support China's ambitious carbon reduction targets outlined in the 14th Five-Year Plan. CAAC has established a specific goal to reduce carbon intensity to below 0.886 kg CO_2 per metric ton-kilometer by 2025. According to CAAC, China reached the target ahead of schedule by averaging 0.854 kg CO_2 per metric ton-kilometer by 2024.

The integration of aviation into China's Emissions Trading Scheme represents another dimension of the domestic approach, where a Life Cycle Assessment (LCA) framework will play a crucial role in evaluation processes. China’s strategy positions it to address aviation emissions through nationally controlled mechanisms while maintaining the flexibility to engage with international frameworks on its own terms.

Table 3. China: Major SAF Policies

Time	Issuing Department	Policy	Main Content
December 2024	MIIT, NDRC, NEA	Implementation Plan for Clean Low-Carbon Hydrogen Use in Industry	Support SAF technologies like alcohol-to-jet, Fischer-Tropsch synthesis, hydroprocessed oils, and CO_2 hydrogenation; encourage SAF R&D and demonstration collaborations.
October 2024	NDRC, MIIT, Ministry of Housing, Ministry of Transport, NEA, Data Bureau	Guiding Opinions on Promoting Renewable Energy Substitution	Promote SAF use; support pilot SAF programs in qualified regions; develop green fuels like biogas, biodiesel, and bio-jet fuel.
August 2024	Central Committee & State Council	Opinions on Accelerating the Green Transformation of Economic Development	Promote SAF R&D and application; by 2030, reduce carbon intensity per transport turnover unit by 9.5 percent from 2020 level.
October 2023	MIIT, Ministry of Science & Technology, CAAC, etc.	Green Aviation Manufacturing Development Outline (2023–2035)	By 2025, achieve demonstration application of domestically produced civil aircraft using SAF.
June 2022	Ministry of Transport, CAAC, etc.	Implementation Opinions on Carbon Peaking and Carbon Neutrality	Clearly call for active promotion of SAF application.
June 2022	NDRC & NEA	14th Five-Year Plan for Renewable Energy Development	Scale up SAF to replace gasoline/diesel in aviation.
May 2022	NDRC	14th Five-Year Plan for Bio-Economy Development	Encourage biodiesel pilots in suitable regions; advance SAF demonstration and application.
January 2022	CAAC	14th Five-Year Plan for Green Development of Civil Aviation	Aim to reach a cumulative SAF consumption of 50,000 MT by 2025.
October 2021	State Council	Action Plan for Carbon Peaking by 2030	Strongly promote advanced bio-liquids and SAF to replace traditional fuels and improve end-use fuel efficiency.

Source: Chinese government agencies.

C. Trade Policy Covering Import Duties/Licenses & Export Taxes/Levies

Import Tariffs

On May 12, 2025, the United States and China jointly announced a reduction of the Beijing's retaliatory tariffs related to a series of original tariff announcements dated April 4, April 9, and April 11 that had increased rates up to 125 percent in addition to existing retaliatory tariffs. The rates associated with these State Council Tariff Commission Announcements 4, 5, and 6 will now be 10 percent in addition to existing duties and retaliatory tariffs. (Please refer to GAIN Report CH2025-0111 for more details).

Table 4. China: Import Tariffs on Ethanol

HS Code (8-digit)	Product Description	MFN Rate	Section 232 Retaliation	Section 301 Retaliation	SCTC Ann. No. 2	MOFCOM May 12, 2025	Total Applied Tariff	Total Applied Tariff with 301 Exclusion
	Implementation Date	1/1/2025	4/2/2018	2/14/2020	3/10/2025	5/14/2025	5/14/2025	5/14/2025
22071000	Undenatured Ethyl Alcohol, Of Alcohol V.≥80%	40%		25.0%		10%	75.0%	50.0%
22072000	Ethyl Alcohol & Other Spirits, Denatured Of Any St	30%	15%	25.0%		10%	80.0%	55.0%

Source: State Council Tariff Commission.

Denatured Ethanol (HS 220720)

On January 1, 2017, Beijing increased the tentative tariff rate for denatured ethanol (HS 22072000) 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 retaliatory tariff on U.S.-origin denatured ethanol, raising the tariff from 30 percent to 45 percent. Later, on July 6, 2018, China imposed an additional 25-percent retaliatory tariff on imports of U.S. denatured ethanol in response to the U.S. Section 301 action, raising the effective tariff to 70 percent. Importers may apply for an exclusion of the retaliatory Section 301 tariff and effectively reduce the total tariff to MFN plus retaliatory Section 232 tariffs. (Note: While China has not issued an official statement, industry sources report that Beijing will suspend the market-based tariff exclusion process on certain U.S. imports, including agricultural imports, as of October 30, 2025, and that all approved exclusions are only valid until December 13, 2025. (Please see GAIN CH2025-0153 for details）

Undenatured Ethanol (HS 220710)

Beijing raised MFN tariff rates on undenatured ethanol to 40 percent on January 1, 2017. On August 3, 2018, MOFCOM announced a retaliatory tariff on U.S.-origin undenatured ethanol, raising the tariff by 25 percent from 40 to 65 percent.

On February 18, 2020, China announced a new round of tariff exclusions for U.S. agricultural commodities impacted by the retaliatory Section 301 tariffs. 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 on Section 301 retaliatory tariffs for this product. The application process through China's Ministry of Finance (MOF) website opened on March 2, 2020. See Post's February 26, 2020 report "China Announces a New Round of Tariff Exclusions" for more information.

Biodiesel (HS382600) and Petroleum Oils Containing Biodiesel (HS27102000)

On August 23, 2018, China imposed an additional 25 percent tariff on U.S.-origin petroleum oils containing 1 to 30 percent biodiesel by volume (HS27102000), which effectively raised the tariff from 6 to 31 percent. At the same time, the duty for U.S.-origin biodiesel-blended petroleum containing more than 30 and up to 99 percent biodiesel by volume as well as pure (B100) biodiesel was raised from 6.5 to 31.5 percent (HS38260000). See GAIN report CH18034. After May 14, 2025, all U.S. products entering into China have a 10 percent tariff in addition to existing duties and retaliatory tariffs. Regardless of the duty rates on U.S. biodiesel, China has never imported U.S. biodiesel even when rates were low because palm-oil based biodiesel from Southeast Asia is priced consistently lower.

For more historical information on China's biofuel policies, please see 2022 Biofuels Annual and 2023 Biofuels Annual Reports.

III. Ethanol

Fuel Ethanol Consumption

In 2025, fuel ethanol consumption is estimated at around 4.3 billion liters, down by 11 percent from 2024 mainly due to projected lower gasoline consumption. China's national average fuel ethanol blend rate is estimated at 2.1 percent, similar to the previous two years. China's E10 mandate area has not been expanded since 2019.

With the rising number of new energy vehicles (NEVs), ethanol gasoline sales have shown a year-on-year declining trend. In 2024, China's NEVs production and sales reached nearly 13 million units, a year-on-year increase of 35 percent. NEVs sales accounted for 41 percent of total vehicle sales, up 9 percentage points from the previous year. In the first two months of 2025, NEVs sales rose by 48 percent year-on-year. Experts expect that NEVs will account for

over 50 percent of total vehicle sales by 2025. According to the International Energy Agency, gasoline consumption will decrease by over 30 percent by 2030 compared to 2024, and ethanol gasoline sales will decline accordingly.

Over the past three years, domestic petroleum prices remained much higher than fuel ethanol prices, encouraging oil companies to blend more ethanol into gasoline. Government agencies overseeing E10 have increased their focus on localities with existing E10 pilots to ensure compliance with the full blend mandate. As a result, pilot areas that did not strictly follow the mandate, especially during the COVID-19 period, have increased actual blending, even though the pilot areas remain unchanged. Stagnant policy and limited surplus grain stocks continue to limit fuel ethanol consumption and, as such, the average blend rate and consumption levels are not expected to see significant changes in the short term.

Reports show that coal-based synthetic ethanol has captured over 50 percent of Shandong Province's fuel ethanol market because of its low prices. This synthetic ethanol has displaced bioethanol in the independent refinery market, which demands around 800 million liters annually. However, the situation could change dramatically if the NEA tightens fuel ethanol supply and demand controls. Under current regulations, refineries can only buy fuel ethanol from licensed producers (see Table 5 for the list of licensed fuel ethanol producers). Currently, only state-owned refineries strictly follow this rule.

The State Council called for controlling the expansion of fuel ethanol processing capacity in 2020, while, in early 2021, NEA urged local governments and companies to support the development of liquid biofuels, regulate ethanol gasoline promotion, and urge gasoline companies to sell liquid biofuel in line with existing regulations. The most recent NEA on Organizing Technological Breakthroughs and Industrialization Pilots for Green Liquid Fuels issued in April 2025 urged promoting biomass-based ethanol production via fermentation.

Fuel Ethanol Production

China’s 2025 fuel ethanol production is forecast to decrease to around 4.3 billion liters, down 11 percent from the previous year due to less gasoline consumption. Fuel ethanol prices are fixed at 91.1 percent of the retail gasoline price, which is set by the NDRC according to a basket of global benchmark crude prices. Crude oil prices rebounded to an average of $71/barrel in 2021, then soared to a peak near $130/barrel in 2022 and stayed at around $81/barrel over the past two years until the first half of 2025. Chinese fuel ethanol prices have fluctuated alongside gasoline prices, with no change in the pricing mechanism, while corn prices have slumped since the end of 2023 to a three-year low in early 2025. Lower corn prices encouraged the use of more corn in the processing sector than in previous years.

The output of coal-based synthetic ethanol has increased significantly over the past two years, while production of grain-based ethanol in Northeast China has declined. Experts expect ethanol production in Central China’s Henan province to increase, and cassava-based ethanol production in northern Jiangsu (East China) will also rise. In contrast, fuel ethanol output has decreased. Downstream chemical consumption has grown, mainly driven by higher demand for chemicals

such as ethyl acetate, acetaldehyde, and dimethyl carbonate, while demand from the liquor industry has declined.

In the first quarter of 2025, China's fuel ethanol production was estimated at approximately 1.2 billion liters, representing a 22 percent increase from the previous quarter but a 15 percent decrease compared to the same period last year. Fuel ethanol demand rebounded compared to the fourth quarter 2024, and its production margin was higher than that of edible and industrial ethanol, leading ethanol producers to favor fuel ethanol. However, the feedstock cost in the second quarter of 2025 started to increase, which outpaced the ethanol price gain, depressing production revenue.

Industry sources report the number of fuel ethanol facilities (25) and their combined production capacity of 8.0 billion liters are up slightly in 2025 after remaining unchanged since 2021. Industry sources report that China's fuel ethanol production was over 75 percent grain-based (i.e., corn, wheat, and rice) in 2024 and 10 percent cassava or sugarcane-based. Corn ethanol is mostly in the Northeast, cassava ethanol is mostly in the East, and molasses ethanol is mostly in the South. From 2018 to 2021, essentially all fuel ethanol expansion was attributed to higher production from China's eight major grain-based ethanol production facilities. Ethanol was transported to consumption areas via truck (87 percent), barge (8 percent), and rail (5 percent).

Table 5. China: Production Capacity of Licensed Fuel Ethanol Plants (2025 estimates)

Producers	Production Capacity	Feedstock
SDIC Jilin Alcohol	887 million liters	Corn
Henan Tianguan	887 million liters	Wheat, Corn, Cassava
COFCO Biochemical (Anhui)	798 million liters	Corn, Cassava
COFCO Bioenergy (Zhaodong)	507 million liters	Corn, Cellulosic
SDIC (Zhanjiang)	190 million liters	Cassava
Shandong Longlive	65 million liters	Cellulosic
COFCO Bioenergy (Guangxi)	253 million liters	Cassava
Zonergy (Inner Mongolia)	38 million liters	Sweet Sorghum
SDIC (Tieling)	380 million liters	Corn
Liaoyuan Jufeng Biochemical	380 million liters	Corn
Jilin Boda Biochemistry	507 million liters	Corn
Jiangsu Lianhai Biotechnology	152 million liters	Corn
Shandong Fu'en Biochemical	152 million liters	Cassava
Jiangxi Yufan	127 million liters	Cassava
Shougang Lanza Tech	58 million liters	Industrial Flue Gases
SDIC (Hailun)	380 million liters	Corn
Wanli Runda (Baoqing)	380 million liters	Corn
Hongzhan (Nehe)	380 million liters	Corn
Hongzhan (Huanan)	380 million liters	Corn
Hongzhan (Bayan)	380 million liters	Corn
SDIC (Jidong)	380 million liters	Corn
Jiliang Tianyu (Changchun)	63 million liters	Corn
Fukang (Meihekou)	63 million liters	Corn
Siji Hongda (Yanjin)	127 million liters	Wheat
Xintianlong (Jilin)	127 million liters	Corn and Cassava

Source: Post industry sources for licensed plants.
Note: Producers are listed in order of production start date.

Table 6. China: Cellulosic Ethanol Pilot Plants (2025 estimates)

Producers	Production Capacity	Feedstock
Henan Tianguan	38 million liters	Wheat and corn stalks; not operational
Songyuan Guanghe	25 million liters	Corn cobs and stalks
Shandong Longlive	65 million liters	Corn cobs; not operational
Jinan Shengquan	25 million liters	Corn stalks, corn cobs; not operational
Anhui Guozhen	64 million liters	Corn and wheat stalks; under construction
COFCO Zhaodong	0.6 million liters	Corn stalks; in trial
Zhongdan Jianye	32 million liters	Planned
SDIC Hailun	32 million liters	Under construction
Anhui Fengyuan	6 million liters	Corn stalks, corn cobs; not operational

Source: Post industry sources.
Note: Producers are listed in order of production start date.

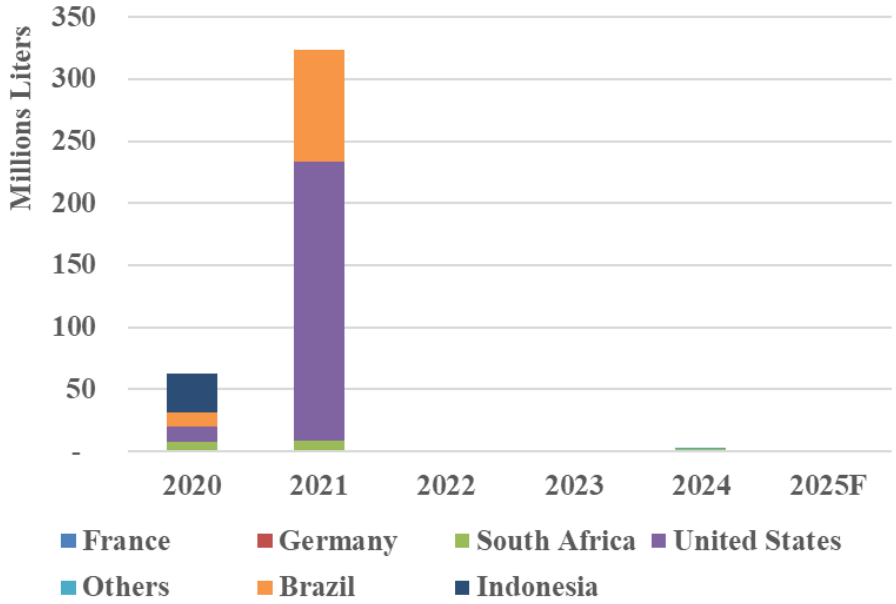
Currently, Lanza Tech is the leading licensed synthetic gas fuel ethanol producer in China. It has four joint venture subsidiaries with Beijing Capital Steel and Iron Group in Hebei, Yunnan, Guizhou and Ningxia. Among these four subsidiaries, only the one in Hebei is a designated fuel ethanol producer approved by China's NEA. The other three can only supply ethanol for industrial use. The four subsidiaries reportedly produce a total of 190 million liters of ethanol each year. As E10 is stagnant and not fully implemented, fuel ethanol production suffers from overcapacity, and the prices of waste gas keep growing, their ethanol has no price advantage in China's market. Over the past few years, industry contacts report that the firm has marketed byproducts (e.g., pure protein-feed powder) totaling 60,000 MT per year to support its business. Please refer to the section Synthetic Fuel Ethanol for more details of coal-based synthetic ethanol production.

Trade

The only ethanol that China has imported for blending in gasoline in recent years came from the United States, and only when prices were highly competitive, duties were low, and China authorities allowed it. Post analysis and industry sources suggest China's political will and endorsement is necessary for significant purchases of imported ethanol. China reportedly waived import tariffs for an unknown volume of U.S. ethanol in 2021. Current retaliatory tariff levels and low political will have limited opportunities for U.S. ethanol exports to China.

On May 13, 2025, Brazil and China signed a landmark ethanol cooperation agreement aimed at expanding Brazil's ethanol exports to China. This strategic partnership is marked by the signing of a memorandum of understanding between Brazil's Energy Minister and China's National Energy Administration. The cooperation also extends beyond traditional fuel use to include SAF, marine alternatives, and bioplastics. Brazil exported around 2 billion liters of undenatured ethanol and 26 million liters of denatured ethanol to the world in 2024. However, China's imports of ethanol were around 6.5 million liters over the past three years. China's existing pilot E10 mandate is also not strictly implemented.

Chart 1. China: Denatured Ethanol Import Statistics (HS 220720)



Sources: China Customs Statistics via Trade Data Monitor, LLC and GACC.
Note: News reports indicate that shipments from Indonesia and Malaysia in 2018 were U.S.-origin product. Imports from all countries were 169,000 liters in 2022, 130,000 liters in 2023 and 5 million liters in 2024 (estimated).

Table 7. China: Ethanol Production, Supply, and Distribution

Ethanol Used as Fuel and Other Industrial Chemicals (Million Liters)										
Calendar Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025f
Beginning Stocks		0	0	0	0	0	0	0	0	0
Fuel Begin Stocks		0	0	0	0	0	0	0	0	0
Production	8,071	9,211	9,770	10,740	10,830	10,580	11,850	12,911	13,452	12,955
Fuel Production	2,534	3,041	2,914	4,300	3,801	3,421	3,804	4,200	4,848	4,302
>of which fossil-based synthetic	0	0	0	0	30	30	40	60	436	516
>of which biobased	2,534	3,041	2,914	4,300	3,771	3,391	3,764	4,140	4,412	3,786
>of which biobased cellulosic	40	30	20	0	0	0	0	0	0	0
Imports	890	24	1,035	104	69	824	0	0	6	1
Fuel Imports	871	8	759	42	63	550	0	0	2	0
Exports	34	135	79	21	367	13	10	34	21	100
Fuel Exports	1	3	35	7	21	4	3	1	1	1
Consumption	8,927	9,100	10,726	10,823	10,532	11,391	11,840	12,877	13,437	12,856
Fuel Consumption	3,404	3,046	3,638	4,335	3,843	3,967	3,801	4,199	4,849	4,301
Ending Stocks										
Fuel Ending Stocks										
Refineries Producing First Generation, Bio-based Fuel Ethanol (Million Liters) 1/										
Number of Refineries	10	11	12	14	20	22	22	22	22	25
Nameplate Capacity	3,600	4,200	5,000	5,257	6,578	7,720	7,720	7,720	7,720	8,000
Capacity Use (%)	69%	72%	58%	82%	57%	44%	49%	54%	57%	47%
Refineries Producting Cellulosic Fuel Ethanol (Million Liters) 2/										
Number of Refineries	1	1	1	1	1	1	1	1	5	9
Nameplate Capacity	65	65	65	65	65	65	65	65	65	65
Capacity Use (%)	62%	46%	31%	0%	0%	0%	0%	0%	0%	0%
Co-product Production (1,000 MT)										
DDGs	1,427	1,719	1,652	2,969	2,586	2,333	2,501	2,840	2,837	2,279
Feedstock Use for Fuel Ethanol (1,000 MT)										
Corn Kernals	4,558	5,105	4,542	6,763	5,426	4,229	4,694	5,957	6,627	5,984
Rice Kernals	na	na	364	2,170	2,357	3,052	3,199	2,484	1,697	860
Cassava (dried chips)	1,902	2,283	2,188	1,303	1,132	1,018	1,469	1,243	1,747	2,067
Wheat	na	387	371	552	480	173	96	632	740	438
molasses	na	na	na	na	na	na	na	na	394	280
Fossil Fuels/Waste Gas	na	na	na	na	na	na	na	na	1,033	1,222
Market Penetration (Million Liters)										
Fuel Ethanol Use	3,404	3,046	3,638	4,335	3,843	3,967	3,801	4,199	4,849	4,301
Gasoline Pool 1/	164,502	170,477	193,010	201,899	197,989	223,977	214,896	217,859	211,856	203,456
Blend Rate (%)	2.1%	1.8%	1.9%	2.1%	1.9%	1.8%	1.8%	1.9%	2.3%	2.1%

Note: Gasoline/ethanol pool overs gasoline and all biocomponents (ethanol, some methanol) and MTBE. China does not produce ethanol derived ETBE in commercial volumes. Fuel blends incorporating ETBE require additional processing and have not been adopted in China. Fossil fuel derived MTBE is the alternative oxygenate used across much of China along with methanol in certain areas. Both are included in the gasoline/ethanol fuel pool series.

Feedstock-to-ethanol yield rate assumptions included at the end of the report.

Sources: Fuel pool is from IEA (Paris), June 2025 updated series. Post estimates and industry sources.

IV. Biodiesel / Renewable Diesel (HDRD)

Consumption

In the first half of 2025, domestic biodiesel prices in China continued to rise. Fatty Acid Methyl Esters (FAME) prices increased from $0.90 per liter (RMB 7,600 per MT) at the beginning of the year to $1.00 per liter (RMB 8,300 per MT) by mid-year, a rise of 9 percent. Hydrotreated Distillate Renewable Diesel (HDRD) rose from $1.30 per liter (RMB 10,800 per MT) to $1.50 per liter (RMB 12,000 per MT), an increase of 11 percent, due to rising feedstocks costs and increased demand from the EU and Southeast Asia. As a result, the domestic promotion of biodiesel application is progressing slowly, with most production still geared toward exports.

China's 2025 BBD consumption is estimated at 750 million liters, 7 percent higher than 2024. As China has adopted a series of new policies to promote domestic biodiesel and HDRD consumption. Since NEA launched biodiesel promotion trials in 22 regions based on pilot experience in Shanghai and other cities, significant progress has been made by 2024 in policy support and promotion, including breakthroughs in tax policy, implementation of biodiesel blending and bunkering in bonded zones, and improved industry standards and regulations.. However, several issues remain, such as unreasonable tax incentives, inability to issue invoices for blended biodiesel sales, lack of blending infrastructure in inland counties, no specific code for marine blended fuel, ineligibility for bonded status, unclear rules on consumption tax and export quota management.

Biodiesel

In contrast to most other countries, biodiesel in China is mainly used for plasticizers, electric power generation, fishing vessels, and farm equipment. Post contacts report that on-road transport accounts for slightly less than half of total biodiesel demand. UCO is the main feedstock for China's biodiesel production.

Domestic FAME consumption is primarily supported by B24 bunker fuel market, which is completely driven by policies rather than economic factors. Bunker pilot progress is listed below. However, the adoption is still hindered by unclear regulation and certification, EU anti-dumping duties, and rising raw material costs.

- On September 30, 2024, China Marine Bunker Supply Co., Ltd. successfully bunkered 908,800 liters (800 MT) of B24 marine biofuel oil from the vessel Hongxin 106 at Xiamen Yuanhai Terminal to the Xin Chiwan, a container ship owned by COSCO Shipping Lines. This was the first-ever marine biofuel bunkering operation in Fujian Province, marking a breakthrough in the province's green marine fuel supply business.
- In October 2024, PetroChina Fuel Oil Co., Ltd. completed the bunkering of 6 million liters (5,113 MT) of B24 marine biofuel in Guangzhou. However, due to current restrictions under Guangdong's Free Trade Zone regulations, biodiesel and low-sulfur marine fuel must be blended in Hong Kong before being transported to the Guangzhou FTZ for bunkering. Related policy and regulatory frameworks still require further coordination and clarification.

- On November 13, 2024, the State Council gave its in-principal approval to the "Plan for Building a Bulk Commodity Resource Allocation Hub in the China (Zhejiang) Pilot Free Trade Zone." The blending of biodiesel and low-sulfur marine fuel within free trade zones (bonded zones) will serve as a breakthrough initiative under the plan, aiming to accelerate the nationwide promotion of bonded marine biofuel.
- At Hubei's Songzi Port on the Yangtze River, authorities are promoting B24 marine biofuel oil for use, targeting various types of vessels on Yangtze River passenger and cargo routes.
- In May 2025, China Marine Bunker successfully bunkered 6 million liters (5,600 MT) of bonded B24 biofuel oil to the SALLY MAERSK vessel berthed at the Guandong Terminal of Shanghai Yangshan Port, setting a new national record for the largest single bunkering of marine biofuel oil in China.
- In May 2025, the bunkering vessel "Zhoushun 10" completed a ship-to-ship transfer of approximately 4.8 million liters (4,200 MT) of B24 high-sulfur biofuel oil to the Singapore-flagged KASTEN MAERSK at the Beisan Jisi Terminal of Chuanshan Port Area, Ningbo-Zhoushan Port, in the Ningbo Area of the Zhejiang Pilot Free Trade Zone.

For on-road biodiesel consumption, Shanghai is still the only municipality supporting a B5 biodiesel mandate. In October 2017, Sinopec Shanghai began offering B5 diesel at a $0.05 per liter (RMB 0.3) 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. Shanghai produces about 41.8 million liters (40,000 metric MT) of UCO each year. There are 18 designated companies collecting UCO from 40,000 oil producing units daily. Shanghai currently has three blending centers with an annual B5 diesel distribution capacity of over 600,000 MT (equivalent to 30,000 MT or 34 million liters of B100 biodiesel) to over 300 gas stations, which accounts for half of Sinopec Shanghai's total gas stations in the city. By the end of 2023, Shanghai offered close to 36 million cars a total of 3 billion liters of B5 biodiesel, an equivalent of 177 million liters of B100 biodiesel.

The Shanghai government subsidizes biodiesel blenders based on the amount of biodiesel sold to gasoline stations. The government also subsidizes producers when diesel prices drop below $902 (RMB 6,000) per ton. The city published the Industry Standard of B10 Diesel produced by UCO in 2021. In January 2021, Hainan provincial officials proposed resuming the B5 mandate the province adopted 10 years ago, but officials have yet to act.

To encourage BBD consumption, China also launched a process to modify B5 biodiesel national standards in March 2024. The International Sustainability and Carbon Certification's (ISCC) accreditation of B24 biodiesel for shipping use has also accelerated. Shipping and maritime companies widely recognize BBD as a "ready-to-use" clean fuel and use BBD in major refueling ports around the world. NEA's Notice on *Organizing Pilot Demonstrations for the Promotion and Application of BBD* instructs local governments to promote biodiesel (fuel oil) such as B5 and B24 for ships in bonded zones, free trade zones, and other areas. Among the three NEA-endorsed pilot projects led by State-owned Enterprises (SOEs), the BBD promotion and application pilot projects of China Marine Bunker Co., Ltd. and Sinopec Fuel Oil Sales Co., Ltd. are expected to focus on BBD use in the shipping industry. The two companies have reportedly explored the domestic biofuel refueling business. China's B24 shipping refueling is still in early

development stage. Industry projects China's domestic BBD consumption will begin in the shipping/maritime industry, but overall consumption increases will not be noteworthy until 2026.

Renewable Diesel (HDRD)

China's 2025 HDRD/SAF consumption is estimated at 80 million liters, more than double the volume consumed in 2022, mainly due to policies supporting SAF consumption. By the end of 2025, the conclusion of the 14th Five-Year Plan, SAF consumption is expected to meet the target, reaching 60 million liters (50,000 MT). (Please refer to section V. Advanced Biofuels for more information).

The government-endorsed pilot program of Beijing's Haidian has developed a three-year HDRD pilot promotion plan, and experimental fueling has already begun. Fueling infrastructure, vehicles, and fuel supply have all been put in place with the support of the participating enterprises. Companies involved in the pilot include Sinopec and China National Aviation Fuel Group (CNAF), with feedstock sourced from McDonald's and KFC. The main challenge currently faced is the lack of a national standard for HDRD. Existing standards are insufficient to support its application at the end-user level. HDRD still remains mostly export- focused, particularly to the EU. Industry believes China's new efforts to promote domestic consumption of biodiesel and HDRD will not see any notable deliverables until 2027.

Production

From 2020 to 2025, China's biomass-based diesel production showed a trend of rising first and then declining. In 2023, BBD output reached a recent peak of approximately 3.24 billion liters, mainly driven by increased demand from the EU, which stimulated China's BBD production and exports. However, in 2025, production is projected to drop sharply to 1.87 billion liters, down 30 percent year-on-year. The main reason for the decline was the EU's imposition of provisional anti-dumping duties ranging from 12.8 percent to 36.4 percent on BBD from China. Since about 80 percent of China's BBD is exported to the EU, these duties significantly squeezed profit margins, leading most biodiesel plants to suspend operations. Only a few leading companies are maintaining production under long-term contracts. According to available information, of the 40+ Chinese FAME producers subject to the 21.7 percent anti-dumping duty, about one-quarter have already exited the industry. The remaining FAME producers have largely shifted focus to processing and trading industrial-grade blended oil (UCO), while many HDRD producers have either already transitioned or are preparing to shift toward SAF production for export.

FAME output is estimated to be around 1.2 billion liters, down 34 percent year-on-year. China FAME plants are mainly located in Hebei, Fujian, Zhejiang, and Shandong provinces. Hebei accounts for 30 percent of the total, with major producers including Hebei Jingu, Tangshan Jinlihai, and Hebei Huide. Fujian holds a 20 percent share, primarily represented by Zhuoyue New Energy, the largest biodiesel producer in the country. Zhejiang and Shandong account for 13 and 10 percent, respectively.

HDRD output is estimated to be 700 million liters, down 21 percent year-on-year. Domestic HDRD production is mainly concentrated in Shandong, Jiangsu, Henan, Anhui, and Liaoning.

Jiangsu holds the largest share at 65 percent. Shandong follows with a 20 percent market share, and Henan accounts for 15 percent.

China's total operational BBD production capacity at the end of 2025 is forecast to remain at 6.5 billion liters, of which 3.5 billion liters or 54 percent of the capacity is FAME, while around 3.0 billion liters or 36 percent of the total prosecution capacity is HDRD/SAF. Industry sources report that FAME producers operate at 33 percent of capacity, while HDRD/SAF producers are operating at 23 percent capacity.

China's BBD production capacity expanded rapidly over the past 5 years due to strong export demand, but slowed in 2025 on weaker export demand hurting profitability. Zhuoyue New Energy is the leading FAME biodiesel producer, with a 114 million liters per year production line that started in October 2022. The company plans to expand its capacity to 925 million liters (including more than 130 million liters of HDRD capacity) from the current 570 million liters in 3 to 5 years. Zhejiang Jia'ao also plans to expand capacity to 1.53 billion liters from current capacity of 570 million liters. Another emerging giant, Shangao Huanneng, also plans to build 1.48 billion liters of biodiesel production capacity (including 1.03 billion liters of HDRD and 454 million liters of FAME) on top of their existing UCO trading business.

Table 8. China: Major Biodiesel/FAME Producers

Producer	Production Capacity
Zhuoyue New Energy	570 million liters
Hebei Jingu Group	284 million liters
Bimei New Energy	341 million liters
Tangshan Jinhai Biodiesel	180 million liters
Hebei Longhai Biofuel	68 million liters
Shandong Fenghui	68 million liters
Zhejiang Jia'ao Environment Protection (Dongjiang)	570 million liters
Jingzhou Dadi Biotechnology	57 million liters
Shanghai Zhongqi Environment Protection	125 million liters
Shangao Environmental	454 million liters

Source: Post industry contacts. 1 MT biodiesel= 1,136 liters of biodiesel.
Note: Producers are listed in order of production start date; does not include all producers

Table 9. China: Major HDRD Producers

Producer	Existing and planned Production Capacity
Hainan Huanyu	128 million liters
Yangzhou Jianyuan	256 million liters
Sanju Rizhao	512 million liters
Zhenhai Refinery	128 million liters
Henan Junheng	230 million liters
Shandong Huidong	230 million liters
Sanju Hebi	237 million liters
Shandong Linyi Huibang	256 million liters
Zhangjiagang Eco Biochemical Technology	385 million liters
Shandong Zhonghai Jingxi	512 million liters
Shandong Binyang Ranhua	512 million liters
Shandong Shangneng	512 million liters
Zhejiang Jia'ao Huanbao	641 million liters
Sichuan Jinshang	256 million liters
Zhuoyue New Energy	128 million liters
Jiangxi Zunchuang	256 million liters
Anhui Yisheng	256 million liters
Liaoning Pengyao	256 million liters
Hebei Huiyuan	256 million liters
Shenzhen Langkun	256 million liters
Shandong Qingdao Lidong	N/A (No capacity reported)
Shandong Dongying Aoxing	1,282 million liters
Shandong Zhande	512 million liters

Source: Post industry contacts. 1 MT HDRD = 1,282 liters of biodiesel.
Note: Producers are listed in order of production start date.

Trade

Biodiesel imports in 2025 are estimated at 80 million liters, 100 percent higher than 2024. China does not import HDRD. From January to June 2025, China’s biodiesel imports almost tripled year-on-year.

The main reason for the increase in import volume is that China’s biodiesel market has long been export-oriented, with monthly imports typically around 1 million liters. However, in April and May, more than 5 million liters of biodiesel were imported from Hong Kong to mainland China, with an average import price ranging from $1,100 to $1,200 per metric ton. The trade was conducted under customs supervision as tax-free goods entering and exiting bonded regulatory areas. Similarly, there is an increase in China's imports of U.S. biodiesel in the first half of 2025. These are imported through Guangdong via bonded areas (Customs Warehousing Trade) as transit trade. These imports did not enter into China’s domestic market.

Around 50 percent of imports are palm oil-based biodiesel from Malaysia and Indonesia. China's import demand for biodiesel triggers when the PO-GO price spread (Palm oil price less the gasoil price) falls below minus $70-$80/MT. The PO-GO price spread shows the import window for China was mostly closed for all of 2020 and 2021 but opened in the second half of 2022. From July 2022 to April 2023, China's BBD imports soared by 56 percent. Over the past year, the PO-GO spread remained above $200/MT after mid-2024, while import profit margins stayed slim.

BBD exports in 2025 are estimated at 1.2 billion liters, down 40 percent from 2024 mainly due to the EU's antidumping measures. From January to June 2025, China's total exports of biodiesel reached 430 million liters, a decrease of 320 million liters compared to the same period in 2024, representing a year-on-year drop of 40 percent.

In December 2023, the European Commission launched an anti-dumping investigation following a complaint from the European Biodiesel Board that low-priced imports from China, exceeding initial estimates, are harming the European biofuel industry valued at 31 billion euros ($33.2 billion) annually. In July 2025, the European Commission announced that its investigation into biodiesel from China imports had concluded, with no fraudulent activity found. However, the investigation did reveal systemic issues in certification and auditing processes, and the EU will implement measures to address and improve these areas. In addition, the United Kingdom's Trade Remedies Authority in June 2024 launched an antidumping investigation into biodiesel from China. Sources report the investigation will likely be 6 to 12 months long and analysts estimate this may lead to lower imports of biodiesel from China in the medium- to long-term, depending on the investigation outcome.

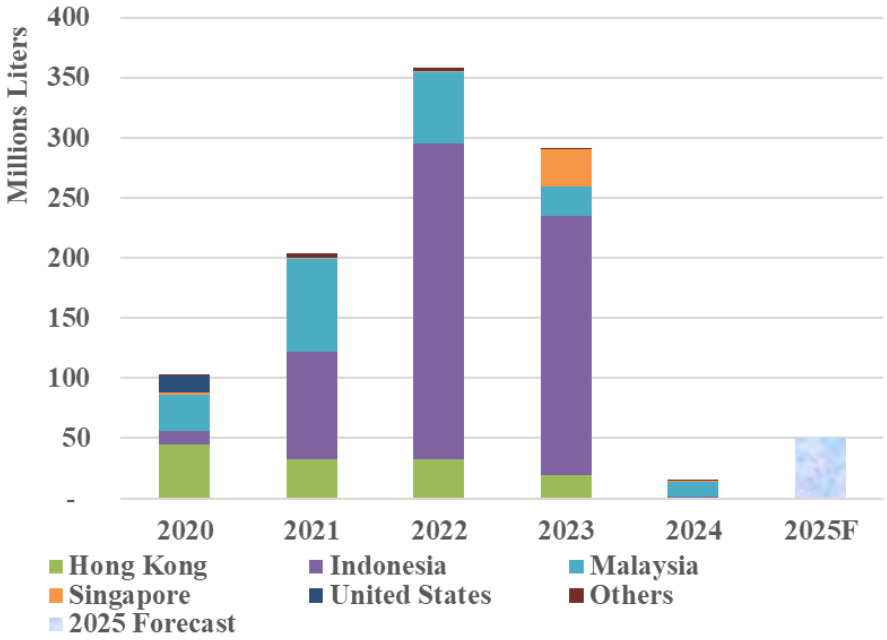
On July 19, 2024, the EU proposed provisional antidumping duties on imports of Chinese BBD, while excluding SAF provisionally. In February 2025, the EU finalized anti-dumping duties on Chinese biomass-based diesel exports, ranging from 10 percent to 35.6 percent, a little lower than provisional rates. Sources think that only Chinese producers receiving less than a 20 percent anti-dumping duty will be able to continue exporting profitably to the EU. Therefore, top Chinese producers are expected to streamline operations and reduce costs or expand scale to maintain profits. Other small producers reportedly have turned to the UCO trading business.

As a result, beginning in March, China's monthly biodiesel exports stabilized at just around 70 million liters. Meanwhile, Southeast Asia has become the largest export destination for Chinese biodiesel, accounting for 57 percent of total Chinese biodiesel exports. In March 2025, Singapore raised the required biofuel blending ratio in marine fuels from 24 to 30 percent, driving up demand for biodiesel. According to the Maritime and Port Authority of Singapore (MPA), Singapore's marine biofuel sales are expected to reach 2.3 billion liters in 2025. Starting in 2030, all port vessels in Singapore will be required to be fully electric or use net-zero emission fuels.

HDRD continues to be exported to the EU. According to official sources, Zhangjiagang Eco seems to be still in a viable position to continue their HDRD export business. Zhangjiagang Eco completed the shipment of 33 million liters of HDRD to Europe in early May. Shandong Haike also recorded 13 million liters of HDRD exports to Europe in May. Industry contacts report

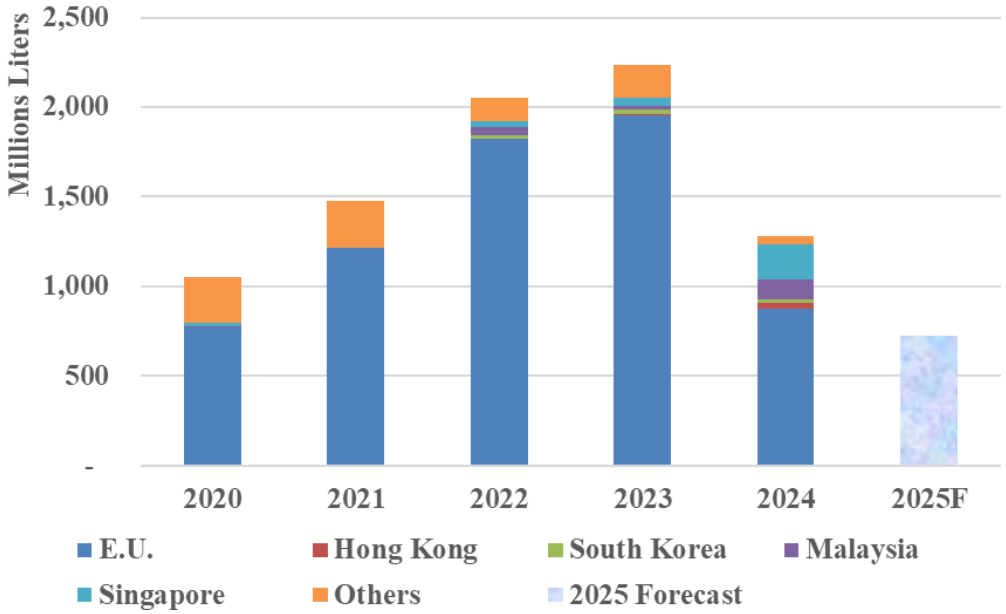
China's HDRD exports mainly fall under HS 27101942 (Petroleum Oils, Oils From Bituminous Minerals, Other Than Crude, & Products Containing By Weight Gt=70% Or More Of These Oils, Not Biodiesel Or Waste), HS 15162000 (Vegetable fats & oils & their fractions), HS 271020 (Petroleum Oils And Preparations Containing Biodiesel, Containing By Weight Gt=70% Petroleum Oils Or Oils Of Bituminous Minerals, Other Than Waste Oils) and HS 27101994 (Liquid paraffin and heavy liquid paraffin, without biodiesel), or sometimes HS 27101929 (Other diesel oils and other fuel oils, without biodiesel). Proportions of HDRD remain unknown.

Chart 2. China: Biodiesel (B100 Equivalent) Imports



Sources: China Customs Statistics via Trade Data Monitor, LLC and GACC.

Chart 3. China: Biodiesel Exports



Sources: China Customs Statistics via Trade Data Monitor, LLC and GACC.
Note: All products traded under HS 3826.00 are assumed to be pure B100 biodiesel; All products under HS 271020 are petroleum oil, containing biodiesel up to 30 percent, are assumed to contain on average 10 percent biodiesel by volume, converted and reported as B100 equivalent.

Due to uncertainty in trade codes used for HDRD, it is possible that some of the products traded under the biodiesel code in chapter 38 is HDRD should, when correctly categorized by chemical makeup, be reported under Chapter 27, code 2710.19. This would be consistent with treatment by customs authorities in the United States, Canada, and Europe. The accurate tracking of HDRD will continue to be investigated in future publications.

Used Cooking Oil (UCO)

China's domestic BBD production uses UCO as its major feedstock, and this has been the case since the early days of the commercial-scale biodiesel industry more than two decades ago. China's UCO industry has a large capacity, but the collection system remains much less organized to distribute most of the total supply to the renewable fuels industry as it does in Europe and the United States. China's initial purpose for developing BBD was to prevent UCO reuse in cooking, food, and feed use. Industry estimates China's UCO supply capacity is around 11 billion liters. Industry estimates China collects around 5.2 billion liters of UCO each year for various purposes, with 3.3 billion liters used to produce BBD in 2024. The maximum potential for UCO collection and for further expansion of BBD production capacity is enormous, but with increasing demand, industry experts recognize the eventual limited supply of UCO for BBD production over the next few years.

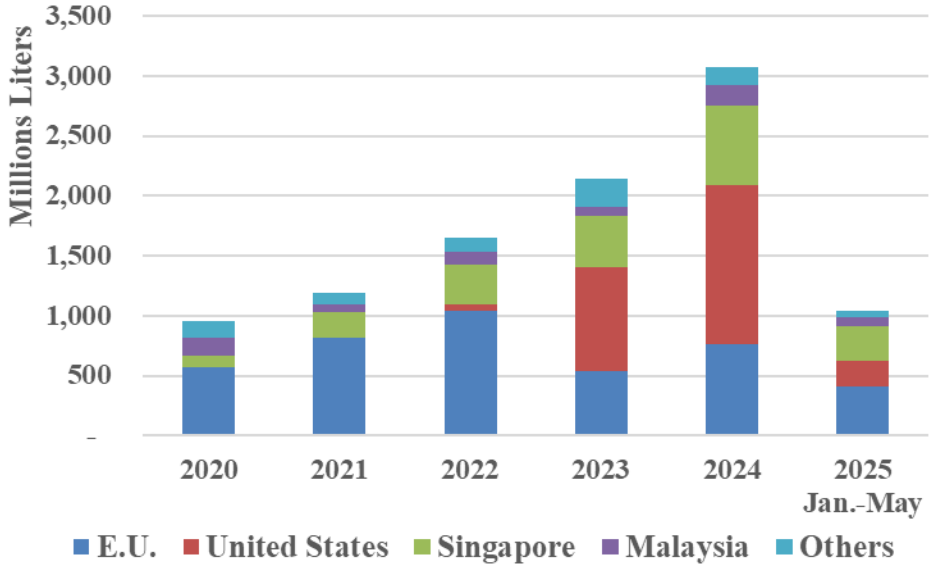
China's UCO exports to all destinations for the first six months of 2025 reached 1.5 billion liters, representing a 2 percent decline year-on-year. The EU became the top destination (mainly to Netherlands, Spain, and Italy), followed by Singapore and the United States. This change results

from shifts in both domestic and international supply-demand dynamics as well as policy directions.

China's UCO has long been export-oriented, but waste oils and fats are key feedstocks to produce FAME and HDRD/SAF. Excessive exports led to instability in the domestic supply of raw materials, significantly constraining the sustainable development of the bioenergy industry. To safeguard the healthy development of the domestic bioenergy supply chain, Beijing in November 2024, introduced a policy to cancel the 13 percent export tax rebates for chemically modified animal, vegetable, or microbial oils, thereby directly curbing export volumes at the policy level. This policy aims to facilitate the shift from export-oriented BBD production to a domestic focus that could be used within the China circular economy, reduce low-value feedstock exports, and promote higher-value SAF exports. (Please refer to GAIN CH2024-0149 UCO Export Tax Rebate Terminated for more details).

On the international front, external pressures have intensified. China is the largest known exporter of UCO and sales in recent years have grown exponentially. Shipments destined for Europe account for the highest percentage of sales by far and most of the growth until 2023, when China UCO exports began shifting to the United States and surged further in 2024. The U.S. surge in HDRD production over the past 2 years, which already eclipsed U.S. biodiesel production, greatly expanded the demand for all eligible vegetable oils and fats feedstock, including increased import demand for UCO, tallow and rapeseed oil. Shipments to the Neste Singapore HDRD plant, which finished a major expansion in 2024 and now includes SAF production capacity, account for most of the remaining sales and sales growth. Additionally, due to changes to U.S. biofuel policies and the 45.5 percent tariff on Chinese UCO since May, exports to the United States dropped to nearly zero. The cascading effects of the tariff escalations also led to short-term demand contraction in the EU and other key markets due to increased trade uncertainty. These multiple international factors combined to drive the decline in export volume during the first half of the year.

Chart 4. China: Used Cooking Oil (UCO) Exports (HS 151800)



Sources: China Customs Statistics via Trade Data Monitor, LLC and GACC.
Note: Used cooking oil (UCO): 1 MT = 1,043 liters of UCOME (UCO-based biodiesel).

Table 10. China: Biodiesel and Renewable Diesel Production, Supply, and Distribution

Biodiesel (FAME) & Renewable Diesel (HDRD/SAF), Million Liters										
Calendar Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025f
Beginning Stocks		0	0	0	0	0	0	0	0	0
Production	909	1,043	834	939	1,455	1,835	2,430	3,235	2,660	1,870
>HDRD/SAF Production	-	42	146	332	300	620	940	1,000	890	700
Imports	8	18	853	953	102	204	358	291	40	80
Exports	76	194	357	752	1,035	1,475	2,054	2,776	2,000	1,200
>HDRD/SAF Exports	-	42	146	332	300	600	900	900	820	620
Consumption	841	867	1,330	1,140	522	564	734	750	700	750
>HDRD/SAF Consumption	-	-	-	-	-	20	40	60	70	80
Ending Stocks	0	0	0	0	0	0	0	0	0	0
Production Capacity, Biodiesel (Million Liters)										
Number of Biorefineries	48	46	44	40	42	44	46	48	48	38
Nameplate Capacity	2,680	2,680	2,680	2,680	2,726	3,300	3,500	3,700	4,000	3,500
Capacity Use (%)	33.9%	37.4%	25.7%	22.6%	42.4%	36.8%	42.6%	60.4%	44.3%	33.4%
Production Capacity, Renewable Diesel (HDRD/SAF) (Million Liters)										
Number of Biorefineries	0	0	0	0	2	9	11	12	20	41
Nameplate Capacity	-	-	-	-	500	1,000	2,000	2,200	2,500	3,000
Capacity Use (%)					60.0%	62.0%	47.0%	45.5%	35.6%	23.3%
Feedstock Use for Biodiesel (1,000 MT)										
Used Cooking Oil (UCO)	929	1,112	764	674	1,283	1,350	1,656	2,483	1,967	1,300
Feedstock Use for Renewable Diesel (HDRD/SAF) (1,000 MT)										
Used Cooking Oil (UCO)			183	415	375	775	1,175	1,250	1,113	875
Market Penetration, Biodiesel (Million Liters)										
Biodiesel, on-road	273	313	410	430	250	260	284	315	280	300
Diesel Pool , on-road use 1/		114,195	123,612	108,927	104,817	108,435	108,783	105,022	102,008	99,777
Blend rate (%)		0.3%	0.3%	0.4%	0.2%	0.2%	0.3%	0.3%	0.3%	0.3%
Diesel Pool, Total 1/ 2/	200,418	199,951	207,111	209,887	215,718	220,045	211,124	209,391	207,249	205,236
Jet Fuel/Other Kerosene 3/	37,508	42,002	48,962	52,714	44,321	45,794	27,199	48,093	53,988	55,498

Note: 1/ Diesel pool covers diesel and all biocomponents.
2/ Covers all on/off-road uses plus rail & heavy marine diesels and stationary power. **Source**: IEA.
3/ Covers all private-commercial-military kerosene-type jet fuels (fossil and bio-based, both Jet A-1 and naphthakerosene blend Jet B) + other fuel applications (e.g., cooking). Source: IEA.
f = forecast; All PSD data are B100 or B100-equivalent (see statistical info section of Reporting Instructions).
Used cooking oil (UCO): 1 MT = 800-900 liters of BBD.
Source: Post and industry sources.

V. Advanced Biofuels

Sustainable Aviation Fuel Production

China is actively promoting the adoption of biodiesel and SAF (please refer to Policy Section for more information on policies). On September 18, 2024, NDRC and CAAC officially announced

the launch of a SAF application pilot program in Beijing. According to the official plan, the first phase ran from September to December 2024, with key participants including Air China, China Eastern Airlines, China Southern Airlines, as well as Beijing Daxing Airport, Chengdu Shuangliu Airport, Zhengzhou Xinzheng Airport, and Ningbo Lishe Airport. The second phase will cover the entire year of 2025, during which all domestic flights departing from the above-mentioned four airports regularly will be fueled with a 1 percent SAF blend. (Please refer to Table 11 for previous pilot programs).

Table 11. China: SAF Demonstration/Pilot Progress in China

Year	Demonstration/Pilot Progress
2025	Launch of the second phase of the domestic SAF application pilot program. All domestic flights departing from Beijing Daxing, Chengdu Shuangliu, Zhengzhou Xinzheng, and Ningbo Lishe airports regularly fueled with a 1 percent SAF blend
2024	Junheng and Sanju obtain airworthiness certification for SAF CAAC launches pilot application program for SAF Sichuan Airlines uses SAF on regular "Chengdu–Tokyo" route COMAC's ARJ21 and C919 complete their first SAF demonstration flights
2023	Loong Air launches "Green Asian Games" themed Biojet flight Zhengzhou–Luxembourg "Air Silk Road" flight used 10 percent SAF Air China conducted its first wide-body commercial flight using SAF Airbus delivered an aircraft to Sichuan Airlines using SAF
2022	Zhenhai Refining resumes production Colorful Guizhou Airlines conducts 10 percent SAF commercial flight China's first international cargo flight using SAF (jointly by Cainiao and Air China Cargo) A series of delivery flights by Airbus (Tianjin)
2014	Zhenhai Refining obtained China's first SAF airworthiness certificate
2011	PetroChina / Air China / Boeing conduct first biojet fuel test flight

Source: Chinese government agencies.

As of 2023, mainland China used fewer than 12.5 million liters of SAF. By the end of 2025, industry sources expect SAF consumption will reach the planned target of 62.5 million liters (50,000 MT). By 2030, industry projects China's aviation kerosene consumption to reach 74 billion liters (59.5 million MT). At a 6 percent SAF blending rate, the SAF demand would be 4.5 billion liters (3.57 million MT). By 2050, SAF consumption is expected to reach 163 billion liters (130.3 million MT). At a 70 percent SAF blending rate, SAF demand would be 114 billion liters (91.2 million MT).

Currently, four domestic SAF producers have successfully obtained the "Technical Standard Order Authorization (CTSOA)" issued by the CAAC. These companies are Sinopec Zhenhai Refining & Chemical Company (a subsidiary of China Petroleum & Chemical Corporation), Henan Junheng Industrial Group Bio-Technology Co., Ltd., Shandong Sanju Bioenergy Co., Ltd., and Lianyungang Jiaao New Energy Co., Ltd. These four companies manufacture SAF products that meet China's airworthiness certification requirements and have approval for use in China's civil aviation industry.

Table 12. China: Major Airlines Using SAF

Date	Airline	Blending Ratio	Supplier	Flight Description
June 2024	China Eastern	40%	Sinopec	ARJ21 and C919 aircraft took off from airports in Shanghai and Shandong respectively
July 2023	Air China	10%	Sinopec	First domestic A350 widebody commercial passenger flight using Chinese SAF (Hangzhou to Beijing)
May 2023	China Eastern	15%	Sinopec	First commercial use of SAF on flight from Shanghai Hongqiao to Xi'an Xianyang
December 2022	Air China	100%	Sinopec	Flight CA1027 departed from Hangzhou Xiaoshan Airport and landed in Liège, Belgium
October 2022	China Southern	100%	Sinopec	Airbus delivery flight at Tianjin Delivery Center to China Southern Airline
October 2022	Air China	5%	Sinopec	Airbus delivery flight at Tianjin Delivery Center to Air China
October 2022	China Eastern	5%	Sinopec	Ferry flight from Tianjin to Xi'an; first SAF-powered delivery of an Airbus assembled in China

Source: Chinese government agencies.

In addition to passenger flights, SAF also holds significant potential for cargo flights. With the rapid growth of the e-commerce industry, air freight volumes continue to rise, several airlines, including Air China and China Eastern Airlines, are actively exploring the application of SAF in cargo flights. It is expected that the adoption of SAF in the air freight sector will gradually expand in the future.

China's SAF production capacity by 2025 is projected to surpass Europe to reach 3.0 to 3.8 billion liters. Global pressure for carbon reduction, long-term market potential, and limited but impactful policy support are helping accelerate the SAF industry in China. There are more than 40 SAF plants that are built, under construction, or planned by mid-2025 (please refer to Table 13). However, industry contacts note that it seems that Beijing has slowed down its policy incentives for SAF production in 2025, far less than previously anticipated.

China's SAF development follows a phased technology roadmap involving four main pathways: HEFA (Hydroprocessed Esters and Fatty Acids), G+FT (Gasification + Fischer-Tropsch), AtJ (Alcohol-to-Jet), and PtL (Power-to-Liquid). HEFA is already in commercial operation, mainly using waste cooking oil as feedstock. G+FT and AtJ are currently in the R&D stage and should enter full operation between 2030 and 2040. PtL, which uses renewable electricity and CO_2, will remain under research until 2040, after which will scale up for commercial use post-2040. In terms of feedstock, SAF production potential comes from agricultural waste and forestry waste (i.e., biomass), UCO, ethanol, urban organic solid waste and ethanol from industrial waste gases The PtL pathway has theoretically unlimited capacity, constrained only by renewable energy and CO_2 availability.

SAF industry insiders complain that many small-scale investors are entering the sector without a full understanding of the technical and economic risks. After a price surge due to China canceling export tax rebates in late 2024, SAF demand and prices dipped starting April 2025. SAF prices fell from $3.20/liters in 2022 to $1.40/liters in 2025, causing cross-industry losses. And the low-mandatory SAF blending ratio (previously expected at 2 percent has been reduced to only 1 percent) has instead shaken confidence. Total usable waste oils are estimated at 5.2 billion liters, not enough to match planned SAF capacity. Even with advanced technology, oil-to-fuel conversion rates are around below 75 percent. Industry experts stress the need for rational investment and technological advancement, with emphasis placed on catalyst development, hydrotreatment efficiency, policy support, and cost control.

Table 13. China: SAF Production Capacity (2025 estimates)

Province	Company	Capacity (million liters/year)	Product	Estimated Start Time	Notes
Shandong	Sanju Bioenergy	62.5	SAF	July 2025	Beijing Haixin project, Phase II, HEFA technology; In November 2024, the plant obtained HEFA-SPK airworthiness certification; 2.5 billion liters total; 62.5 million liters for current capacity
Shandong	Haike Bioenergy	250	HDRD/SAF	In production	Axens Vegan Technology
Shandong	Pengyao Bioenergy	50	SAF	Start trial production in August 2024.	HEFA technology
Zhejiang	Sinopec Zhenhai	62.5	SAF	Production suspended	SRJET technology; the plant obtained China's first SAF airworthiness certificate in 2014
	Sinopec-TotalEnergies	28.8	SAF	TBD	Agreement signed in May 2024
Zhejiang	Lanjing Bioenergy	625	HDRD/SAF	December2025	HEFA technology
Zhejiang	Jia'ao Environmental Tech Co., Ltd.	625	HDRD/SAF	125 million liters already in production	UOP Ecofining technology; In March 2025, Jia'ao obtained the "Technical Standard Order (TSO) Authorization" issued by CAAC
Zhejiang	Ningbo Jiesen New Energy Technology	125	HDRD/SAF	Under construction	
Zhejiang	Tianfu Hongyun Energy	125	HDRD/SAF	TBD	Ningbo Jiesen's project
Sichuan	Jinying New Energy	375	HDRD/SAF	November 2026	Total planned: 625 million liters

Sichuan	Tianzhou General Aviation Tech	250	HDRD/SAF	End of 2025	Total planned: 625 million liters Construction started July 2024. Phase I: 250 million liters/year targeted by end 2025.
Sichuan	Jinshang New Energy	500	SAF	TBD	Production to start in 2026; UOP Ecofining technology
Shanghai	Xiangwei Environmental Tech	375	SAF	End of 2026	
Shanghai	Zhongqi Environmental Tech	375	SAF	Project approved, not yet under construction	
Shanghai	Lanze Energy Tech	125	SAF	Tech self-developed, under application	Located in Chongqing Changshou Chemical Park
Jiangsu	Zhongshun New Materials	750	SAF	Under planning	Located in Chongqing
Jiangsu's Zhangjiagang	Eco Biochemical Technology	250	SAF	125 million liters of production in 1H 2024	HEFA technology
Jiangsu	Nanjing Qidong Chemical	312	HDRD/SAF	End of 2025	
Heilongjiang	Zhongneng (Shuangyashan) Energy	125	SAF	Started construction October2024	Phase I: 125 million liters Phase II: 1,000 million liters
Heilongjiang	State Power Investment Corp (SPIC)	500	SAF	TBD	SPIC will build a pilot plant making SAF from wind powerbased hydrogen, the first plant of its kind in China.
Henan	Junheng Bioenergy Technology	1,000	HDRD/SAF	HEFA technology. Under construction	Total plan: 1,250 million liters; 250 million liters already built; In 2023, the company receiving the CAAC's HEFA-SPK airworthiness certification.
Hebei	Huiyuan Chemical Tech	250	HDRD/SAF	Mid 2025	—
Hebei	Sigai Energy Tech	250	SAF	Under planning	—
Hebei	Feitian Oil Chemical	375	HDRD/SAF	August 2025	HEFA technology
Hebei	Zhongneng Yida (Hebei) New Energy	500	HDRD/SAF	1Q 2027	—
Hainan	Sikeyuan Green Energy	375	HDRD/SAF	June 26	—

Guangxi	Haixia Qingneng (Laibin) Chemical Engineering	375	SAF	Under planning	—
Guangxi	FTZ Chuangui Lingang New Energy	375	HDRD/SAF	Under planning	
Guangxi	FTZ Hongkun Biomass Fuel	375	HDRD/SAF	Early 2026	Total plan: 750 million liters; Construction to start May 2024; production by 2026.
Fujian	Zhuoyue New Energy	125	SAF	125 million liters by 2025 end	Total plan: 250 million liters
Anhui	Yisheng New Energy	250	SAF	December25	256 million liters of HDRD in production
Anhui	Yuanfengyuan Energy Conservation and Environment Protection	625	SAF	Project approved, not yet under construction	—
Liaoning	CECG	25	SAF	TBD	Under planning
Inner Mongolia	CECG	125	SAF	TBD	Project signed June 2024.
Xinjiang	CECG	125	SAF	TBD	Project signed June 2024.
Xinjiang	CECG	125	SAF	TBD	Project signed June 2024.
Jilin	Zhengtai New Energy	25	SAF	TBD	Production to start in 2026
Guangdong	Donghua Energy	1,250	SAF	TBD	Trial I planned to operate in 2023; 938-1,250 million liters
Shaanxi	PetroChina Changqing Petrochemical	125		TBD	start building in June 2025. Two other plants by North China Petrochemical and Yunnan Petrochemical also announced

Source: Post industry contacts.
1 MT SAF, HEFA-type = 1,250 liters of SAF.
Note: Producers are listed in order of production start date.

With almost no near-term large-scale domestic commercial demand, SAF refiners are initially targeting exports, which industry executives expect the Chinese government will eventually manage through a system of quotas. On April 30, Lianyungang Jiaao New Energy Co., Ltd., received approval from MOFCOM and three other ministries to begin a pilot program for SAF exports in Lianyungang. The approval confirms that Jiaao can produce up to 465.5 million liters (372,400 MT) of SAF in 2025 and is permitted to apply for export licenses within this capacity under HS Code 27101911. With this, Jiaao became the first company in China to be included on the official "exporter whitelist," and Lianyungang was officially designated as China's SAF export pilot zone – marking a major step in establishing a SAF export channel. Under the new policy, white-listed companies will follow conventional aviation fuel export procedures, with strict adherence to verified production capacity. This removes key regulatory barriers for SAF producers in China entering the international market.

In July 2025, China National Aviation Fuel (CNAF) acquired a 10 percent stake in Jiaao. Jiaao was the first SAF producer in China that Beijing granted a SAF export quota and exported 16.75 million liters (13,400 MT) of SAF in May after approval. This investment aligns with NDRC's strategy to focus biofuel use in aviation and maritime sectors as part of China broader energy security and carbon neutrality goals.

CAAC reports that the country currently operates around 4,000 transport aircraft, with annual SAF demand at about 62.5 million liters (50,000 metric MT). By 2050, the fleet is expected to exceed 10,000 aircraft, driving SAF demand to an estimated 56.3 billion liters (45 million metric MT). The Lianyungang pilot zone is seen as a strategic step toward aligning with global aviation hubs and testing trade frameworks. CAAC also established the SAF Development Research Center (SAF Center) in July 2024, aiming to conduct in-depth research on feedstock and process pathways, set up China's independent Civil Aviation Sustainable Certification System (CSCS) for aviation fuel, address bottlenecks and pain points in the development of SAF in China's civil aviation industry, and promote the industry's green and low-carbon transition to achieve the "dual-carbon" goals. (See 2024 Biofuels Annual CH2024-0100 for more information.).

Synthetic Fuel Ethanol

In recent years, China's ethanol industry has been plagued by oversupply and low demand, leading to ongoing structural adjustments. Intermittent production and cost-price inversion have become the norm, resulting in stagnant or even declining ethanol output. However, this trend reversed in 2024, with China's total edible and industrial ethanol production in 2024 reaching 13.45 billion liters, an increase of 4 percent compared to 2023.

This growth did not stem from an improvement in the industry's fundamentals, but rather from the rapid expansion of synthetic ethanol production and its wider application. In 2024, total synthetic ethanol output reached 1.2 billion liters (436 million liters for fuel), more than doubling from 2023, surpassing cassava-based ethanol and ranking second only to grain-based ethanol. China's synthetic ethanol is primarily produced via coal-to-ethanol technology, which converts coal-derived synthesis gas into ethanol through methanol, dimethyl ether carbonylation, and hydrogenation.

With favorable national policies and growing market demand, the coal-based ethanol industry has seen rapid development. Currently, 14 coal-to-ethanol plants have been built nationwide, nine of which are operational, including major producers such as Anhui Tanxin, Shaanxi Yushen, Henan Liyuan, and Shandong Hengxin. Shandong Hengxin's new plant, launched in 2025, has a design capacity of 634 million liters per year. In total, planned coal-to-ethanol projects amount to 9.4 billion liters in future capacity.

Forecasts suggest that in the next three years alone, coal-based ethanol production capacity could rise to over 7.6 billion liters, potentially displacing 6.3 billion liters of ethanol used in general chemical applications and an additional 887 million liters in the fuel ethanol market from independent refineries. As of now, coal-based ethanol already has over 3.8 billion liters of capacity, securing 11 percent of the ethanol market within just 2 years. Coal-based ethanol has

taken over more than 50 percent of the fuel ethanol market previously occupied by bio-ethanol in Shandong Province's independent refinery market.

VI. Notes on Statistical Data

Ethanol

Production capacity, production, and consumption figures are based on statistics of industry and FAS post. Ethanol import figures are based on Trade Data Monitor, LLC data, which are sourced from General Administration of Customs of the People's Republic of China (GACC). Feed stock and co-product figures represent FAS posts estimates and are based on the conversion and yield rates listed in the Appendix. HS codes used are 2207 for total ethanol trade and 2207.20 for fuel ethanol trade.

Biodiesel

Biodiesel estimates are based on trade reported under the Chapter 38, though it is unclear if some or all of China's HDRD/SAF exports to Europe fall under the designated Chapter 38 for biodiesel or if they fall under Chapter 27 (2710.19). Some of these products, when misclassified, could be HDRD/SAF since market analysts have documented sales of HDRD/SAF to Europe. HDRD/SAF cannot be accurately tracked at this time due to tariff code uncertainties that Post will investigate further.

Biomass-based Diesel (BBD)

This term refers encompasses biodiesel and HDRD. Production capacity, production and consumption figures are based on statistics of industry and FAS post. Feed stock and co-product figures represent FAS posts estimates and are based on the conversion and yield rates listed in the Appendix.

Trade estimates are based on trade reported under Chapter 38, although it is unclear if some or all of China's HDRD/SAF exports to Europe fall under the designated Chapter 38 for biodiesel or if they fall under Chapter 27 (2710.19). Some of these products, when misclassified, could be HDRD/SAF since market analysts have documented sales of HDRD/SAF to Europe. HDRD/SAF cannot be accurately tracked at this time due to code uncertainties which Post will investigate further.

All product trade under HS 3826.00 is assumed to be pure B100 biodiesel; All products under HS 271020 is petroleum oil, containing biodiesel up to 30 percent and is assumed to contain on average 10 percent biodiesel by volume, converted and reported as B100 equivalent. Post uses industry contacts and qualitative data to adjust biodiesel export estimates to account for expected HDRD/SAF exports incorrectly exported under biodiesel codes. Due to uncertainty in trade codes used for HDRD/SAF, it is believed that some of the products traded under the biodiesel code in chapter 38 could be HDRD/SAF that should be reported under Chapter 27 (according to NesteOil) or Chapter 15.

Post collects information from various sources and industry contacts to estimate HDRD/SAF trade. Industry contacts report China's HDRD exports mainly fall under HS 15162000 (Vegetable fats & oils & their fractions), HS 27101994 (Liquid paraffin and heavy liquid paraffin, without biodiesel), and sometimes HS 27101929 (Other diesel oils and other fuel oils, without biodiesel). However, all of these codes contain other products, and the proportion of HDRD/SAF in the total trade figures remains unknown. In the first six months of 2025, the exported volume of the 3 HS Codes combined fell by 8 percent from last year. The accurate tracking of HDRD/SAF will continue to be investigated in future publications.

Appendix A: Energy Content and Conversion Rates

1 MT Gasoline = 1,256 Liters.
1 MT Ethanol = 1,267 Liters.
1 MT Biodiesel = 1,136 Liters.
1 MT of HDRD = 1,282 Liters.
1 MT of SAF, HEFA-type = 1,250 Liters.
1 MT of UCO = 1,087 Liters.

Feedstock-to-ethanol yield rates:
Corn kernels: 1 MT = 402 (before 2014) to 417 liters (after 2014).
Wheat kernels: 1 MT = 393 liters.
Cassava (dried chips): 1 MT = 333 to 400 liters (15 to 65 percent starch content).
Rice: 1 MT = 400 liters.
Molasses: 1 MT = 246 liters.
Fossil Fuels/Waste Gas: 1 MT = 422 to 423 liters.

Feedstock-to-Biomass-based Diesel yield rates:
Used cooking oil (UCO): 1 MT = 900 liters of FAME.
Used cooking oil (UCO): 1 MT = 800 liters of HDRD.

Ethanol Feedstock-to-Co-product Yield Rates
Corn kernels: 1 MT = 313 kg of DDGs
Other grain kernels: 1 MT = 313 kg of DDGs (negligible vegetable oil).

Appendix B: China's Biofuels Program: Development of Production/Use Targets & Feedstock Priorities

Over two decades old, China's biofuels program remains in essence a surplus corn disposal program. Changes over many years to support the introduction of biofuels have focused almost entirely on ethanol, neglected use of renewables in the diesel pool (except for one city program), and SAF has only recently received attention. Despite years of stated intent, the program has failed to commercialize cellulosic and or any other advanced ethanol industry based on a technology platform other than the fermentation of starch or sugars with the minor exception of coal-to-ethanol.

There has never been a sustained effort or realistic plan to build the average national blend rate for ethanol in gasoline above roughly two percent (E2) despite continually setting higher goals. This is because to do so with existing production technologies and feedstock would have required significant imports for feedstock or fuel-grade ethanol. No effective carbon tax scheme or environmental sustainability criteria for biofuels were ever established to help drive the carbon intensity of all existing biofuels lower. China has failed to commercialize largescale production of cellulosic biofuels including ethanol, even though there is considerable domestic supply of waste agricultural and forest products. Despite large investments and significantly more program support in the United States, Europe and Brazil, cellulosic fuels have mostly failed to achieve widespread commercialization. China looks toward other means to achieve these nationwide GHG emission reduction goals focused on renewable electricity and increasingly hydrogen.

10th Five-Year Plan for Economic and Social Development (FYP) (2001-2005) – Corn Surplus Period

China implemented a fuel ethanol program, one of the world's earliest, starting in the early 2000's to create additional demand for then abundant grain supplies. In MY1998/99, USDA ending stocks estimates for China reached record highs at 123.8 million MT. During these early years, most of the domestic ethanol production relied on existing corn surpluses and was in essence a con disposal program. Beginning in 2005, as global grain prices soared, China began its initial promotion of nongrain, conventional fuel ethanol production known as Generation 1.5 ethanol.

11th Five-Year Plan (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 root for ethanol, and jatropha trees for biodiesel.

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. Fuel retailers 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 provinces with blending requirements do not fully enforce province wide E10 blending. Many provinces remain with no blend mandate and use MTBE instead since they have no major corn growing areas and thus little economic interest in an ethanol program.

In August 2007, NDRC published a "Mid- to Long-term Renewable Energy Development Plan" that targets annual fuel ethanol use to exceed 12.67 billion liters 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, a phase out of Chinese government subsidies for conventional

ethanol plants began, falling from $0.03 per Liter (RMB 2,000 per MT) in 2009 to zero in 2016. Ethanol production subsidies using non-food grain feedstocks to produce conventional ethanol 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 Five-Year Plan (2011-2015) – Corn Surplus Period
In 2010, the government set ambitious targets for ethanol and biodiesel in its 12th FYP, including a goal of producing 5.07 billion liters of fuel ethanol and 1.14 billion liters 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.

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 2.9 billion liters, or less than two-thirds of the original 5.1 billion liter 12th FYP goal.

13th Five-Year Plan (2016-2020) – Corn Stocks Drawdown
On October 24, 2016, China's State Council announced its 13th FYP goal to produce 5.1 billion liters of ethanol and 2.3 billion liters 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 undermined 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; reinstatement of the VAT refund on ethanol products added further support. Industry sources reported at the time that China's provincial corn processing subsidies and a nationwide effort to expand E10 effectively supported margins for ethanol producers.

On September 13, 2017, NDRC, NEA, MOF, and 12 other ministries jointly announced a plan to expand ethanol production and promotion for transportation fuel. This included a nationwide target of 10-percent ethanol blending into gasoline fuel by 2020, and a proposed shift to commercial-scale cellulosic ethanol by 2025. To date, China has not proposed an updated 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 regions where it had already been introduced as corn stocks were too low and ethanol production capacity too small to implement E10 properly nationwide. The expressed use of imports as a vehicle to advance the E10 goal remained off the table.

Biodiesel remains largely unsupported in the domestic market and continues to grow more export-oriented. While there is no significant change in production capacity, capacity utilization is rising. HDRD production has emerged as a new fuel but almost entirely export market oriented with no programs in incentivized domestic use.

14th Five-Year Plan (2021-2025) – Corn Stocks Remain Lower

The outline of the 14th FYP (2021-2025), published in March 2021, sets an 18 percent reduction target for "CO_2 intensity" and 13.5 percent reduction target for "energy intensity" from 2021 to 2025. Biofuels are not expected to realistically contribute to progress on these goals in any meaningful way under any existing plausible scenario.

In May 2022, the NDRC issued the "14th Five-Year Plan for Bioeconomic Development" establishing a national biotechnology framework to boost the bio-economy during the next five years. In June 2022, the NDRC led nine ministries to publish the "14th Five-Year-Plan for Renewable Energy." The plan calls for the development of non-grain biofuel ethanol and encourages promotion of fuel ethanol and biodiesel. Both are considered rather empty statements and nothing new given such statements have been repeated for the past two decades with no new trajectories established for any existing biofuel markets and no record of success commercializing advanced biofuels at scale for use in the domestic market. The plan also called to support research and development and promote the use of advanced technology and equipment in BBD and jet fuel. However, no detailed implementing measures or policies were announced following the release of the two plans.

Appendix C: Commonly Used Acronyms

BBD	Biomass-based Diesel (biodiesel plus renewable diesel (HDRD))
CAS	Chinese Academy of Sciences
CEF	Carbon Emission Footprint
ETS	Carbon Emissions Trading System
CAAM	China Association of Automobile Manufacturers
COFCO	China National Cereals, Oils and Foodstuffs Corporation
CNOOC	China National Offshore Oil Company
CNPC	China National Petroleum Corp
PetroChina	China National Petroleum Corp, publicly listed arm
Chinaoil	China National United Oil Corp, CNPC Trading arm
Sinopec	China Petroleum and Chemical Corporation
Unipec	China Petroleum and Chemical Corporation, Trading arm
CPPCC	Chinese People's Political Consultative Conference
DDGs	Dried Distiller's Grains with Solubles
EV	Electric Vehicle
ETBE	Ethyl Tert-Butyl Ether
FYP	Five-Year Plan
GACC	General Administration of Customs of the People's Republic of China
GHG	Greenhouse Gas
HDRD	Hydrogenation-derived Renewable Diesel

	(world's only renewable diesel commercialized at scale)
HEFA	Hydroprocessed Esters and Fatty Acids
MTBE	Methyl tert-butyl ether
MEE	Ministry of Ecology and Environment
MEP	Ministry of Environmental Protection
MOF	Ministry of Finance
MPS	Ministry of Public Security
NDRC	National Development and Reform Commission
NEA	National Energy Administration
NPC	National People's Congress
NEV	New Energy Vehicles
PM	Particulate Matter
RMB	Renminbi
SCTC	State Council Tariff Committee
SAF	Sustainable Aviation Fuel
UCO	Used Cooking Oil

Attachments:

No Attachments