

INDEPENDENT MARKET RESEARCH CHINA'S REFINED OIL AND FUEL OIL MARKET MARKET STUDY

Prepared for
The Company

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Date:



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For and on behalf of
Frost & Sullivan (Beijing) Inc., Shanghai Branch Co.

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Definitions

Terms	Definitions and Introduction
Blended fuel oil	Oil product which combine different grades of fuel oil with specific physiochemical properties for its intended application, and is normally used in large-scale shipping vessel engines and industrial furnaces.
Crude oil	Petroleum as it comes from the ground, before refining.
Diesel oil	Any liquid fuel used in diesel engines, whose fuel ignition takes place, without spark, as a result of compression of the inlet air mixture and then injection of fuel. Diesel oil can generally be classified into light diesel oil and heavy diesel oil, depending on the freezing points.
Flash point	The temperature at which a particular organic compound gives off sufficient vapour to ignite in air.
Fuel oil	Oil that makes up the distillation residue, and comprises all residual fuel oils (including those obtained by blending). Its kinetic viscosity is above 10 centistokes, a unit for measuring viscosity, at 80 degree Celsius. The flash point is always above 50 degree Celsius and the density is always more than 900 gram per litre. Fuel oil blending is more complicated than a simple mix of components, a standard fuel oil contains approximately 17 physiochemical properties.
Oil refinery	An industrial process plant where crude oil is processed and refined into more useful oil products.
Pour point	The temperature of the liquid at which it becomes semi solid and loses its flow characteristics.
Wharf	A structure that is built on the shore of or projecting into a harbor, stream, etc. so that the vessels may be moored alongside to load or unload or to lie at rest.
Tanker ship	A merchant vessel designed to transport oil products in bulk and major types of tanker ship include the oil tanker, chemical tanker and gas carrier.
TEU	Twenty-foot equivalent unit, a unit of measurement of the volumetric capacity of a container with a length of 20 feet, height of 8 feet and 6 inches and width of 8 feet.
Vapour pressure	The state and measurement of the volatility in gasoline.

Source: Frost & Sullivan Analysis

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Definitions (Cont.)

Terms	Definitions and Introduction
Viscosity	The state and measurement of the resistance in a fluid.
Methyl tertiary butyl ether (MTBE)	MTBE is a flammable, volatile and colorless liquid fuel additive, which is manufactured by the chemical reaction of methanol and isobutylene. MTBE belongs to a group of chemicals referred to as oxygenates. It helps to raise the level of oxygen in gasoline, resulting in a more complete burn of gasoline during combustion, and thus reducing carbon monoxide and soot emissions.
Asphalt	Asphalt is a dark brown to black, thick, viscous mixture of heavy hydrocarbons that occurs naturally or as a residue of crude oil refining or destructive distillation of coal. It is usually used in road paving, roofing, and water proofing applications.

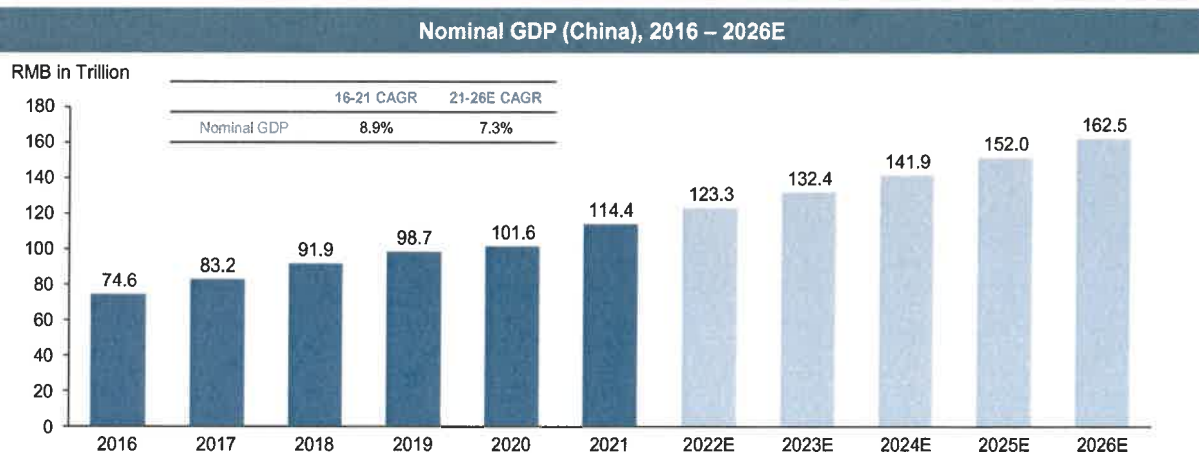
Source: Frost & Sullivan Analysis

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- 2 China's Crude Oil Market Analysis
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China's Nominal GDP Growth



- According to the National Bureau of Statistics of China, the Chinese economy grew at a CAGR of 8.9% from 2016 to 2021. Going forward, the Chinese authorities are likely to maintain the consistency and stability of macroeconomic policies so as to maintain macroeconomic stability. In the meantime, structural adjustment of the economy is predicted to be pushed forward strongly by the Chinese authorities to improve the quality and efficiency of economic development. The Chinese economy is likely to transfer from an investment-driven model to a consumption-driven model with the share of final consumption in GDP picking up. Under this trend, the Chinese economy is likely to maintain a sound and healthy development. According to the International Monetary Fund (IMF), the Chinese economy is forecast to keep growing at a CAGR of 7.3% from 2021 to 2026.
- The Chinese authorities are working to mitigate the negative impact of COVID-19 on the economy, with anti-crisis measures, liquidity provision, fiscal measures, and financial support. According to the IMF, while the impact of COVID-19 continues to unfold, the assessment of the World Health Organisation ("WHO") is that with strong and coordinated measures, the spread of the virus in China and globally can yet be contained. The extent to which the COVID-19 impacts China's economy will depend on future developments, which are highly uncertain and cannot be predicted. The economy in China has been affected since late January and is expected to recover as enterprises in China have gradually reopened since mid-February 2020. According to the Ministry of Industry and Information Technology of the PRC, by the end of March, 2020, 98.6% industrial enterprises above designated size (with annual revenue no less than RMB20 million) and over 70% of the small and medium-sized enterprises in China have resumed its operations. By 8 April 2020, the lockdown of Wuhan has ended. The economy in China is likely to be back to normal and keep stable in the long term.

Nominal GDP Comparison of China and Developed Countries

Nominal GDP Comparison (China vs. Selected Developed Countries), 2016 – 2026E



- China has exceeded Japan in Nominal GDP and become the 2nd largest economy around the world. According to IMF, U.S. maintained to be the largest economy in the world and achieved nominal GDP of approximately USD22.9 trillion in 2021. Compared to U.S., China has certain gap in terms of nominal GDP. By 2021, China's nominal GDP mounted to approximately USD16.9 trillion. In the same year, nominal GDP of Japan, Germany, U.K., France was around USD5.1 trillion, USD4.2 trillion, USD3.1 trillion and USD2.9 trillion respectively. Even though China is expected to slow down its growth pace of macro economy, it is still likely to maintain a faster growth than other developed countries like U.S., Japan and European countries in the coming years.

Source: International Monetary Fund (Oct 2019)

China's Per Capita Nominal GDP Growth

Per Capita Nominal GDP (China), 2016 – 2026E

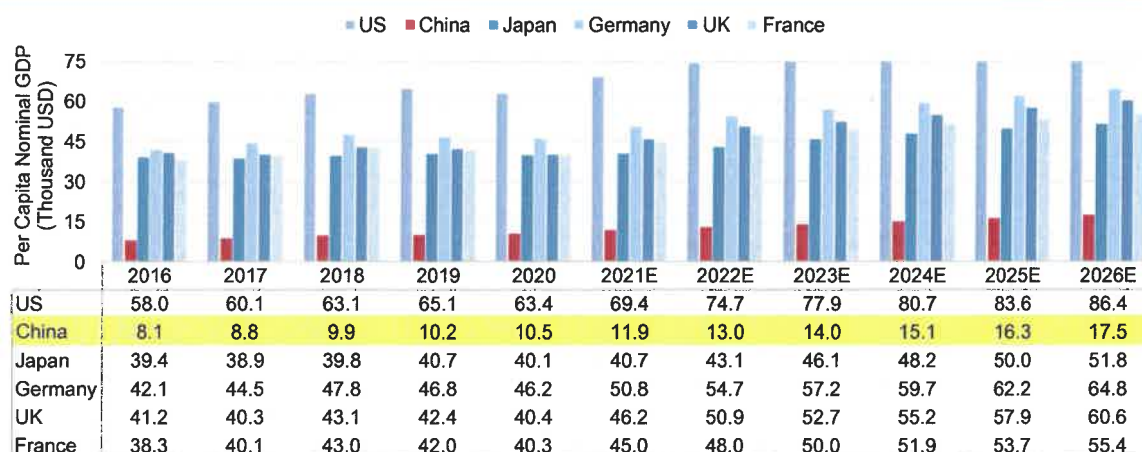


- As total population of China has remained and is expected to remain stable in the future, the growth of per capita GDP is in line with the growing Chinese economy. Per capita nominal GDP in China has kept growing at a fast pace over the past and is expected to maintain the solid growth. For 2021, the per capita nominal GDP in China has reached RMB81.0 thousand.
- In the future, with the sound growth of the Chinese macro economy, the per capita nominal GDP in China is also likely to maintain a steady growth. According to the International Monetary Fund (IMF), the per capita nominal GDP in China is predicted to reach RMB114.1 thousand in 2026, growing at a CAGR of 7.1% from 2021.

Source: National Bureau of Statistics of China; IMF

Per Capita Nominal GDP Comparison of China and Developed Countries

Per Capita Nominal GDP Comparison (China vs. Selected Developed Countries), 2016 – 2026E

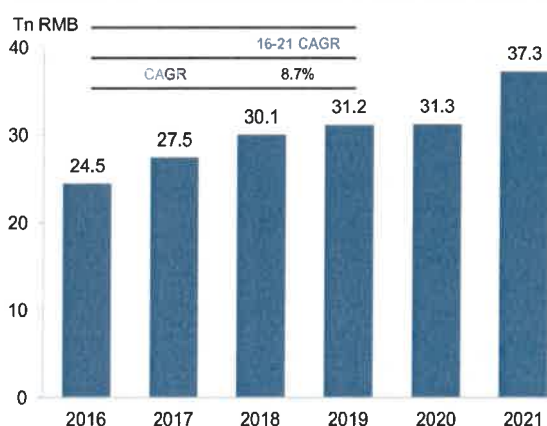


- Different from the scenario of GDP, there are huge gaps between the per capita GDP of U.S., Japan, major European countries, and China. In 2021, the per capita GDP of U.S., Germany, France, U.K., Japan were approximately USD69.4 thousand, USD50.8 thousand, USD45.0 thousand, USD46.2 thousand and USD40.7 thousand. China's per capita GDP in the same year was only approximately USD11.9 thousand. This great gap indicated that China was still in the developing stage as compared to other developed countries in the world.
- Although China has lower per capita GDP comparing to U.S. or the major European countries, the country's per capita GDP keeps growing even under the financial crisis. Given the promising future of the Chinese economy, per capita nominal GDP in China has strong tendency to sustain its growth in the coming years.

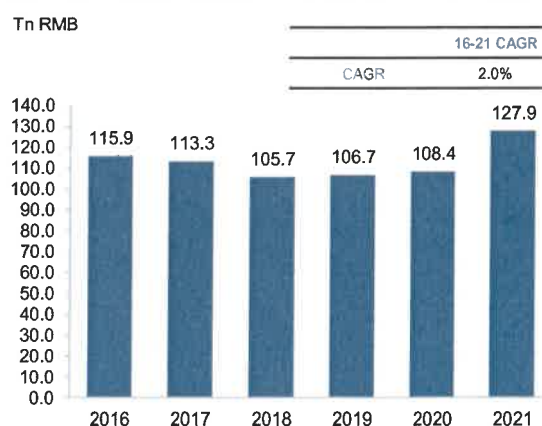
Source: International Monetary Fund

China's Industrial Value-Added

Industrial Value-Added (China), 2016 – 2021



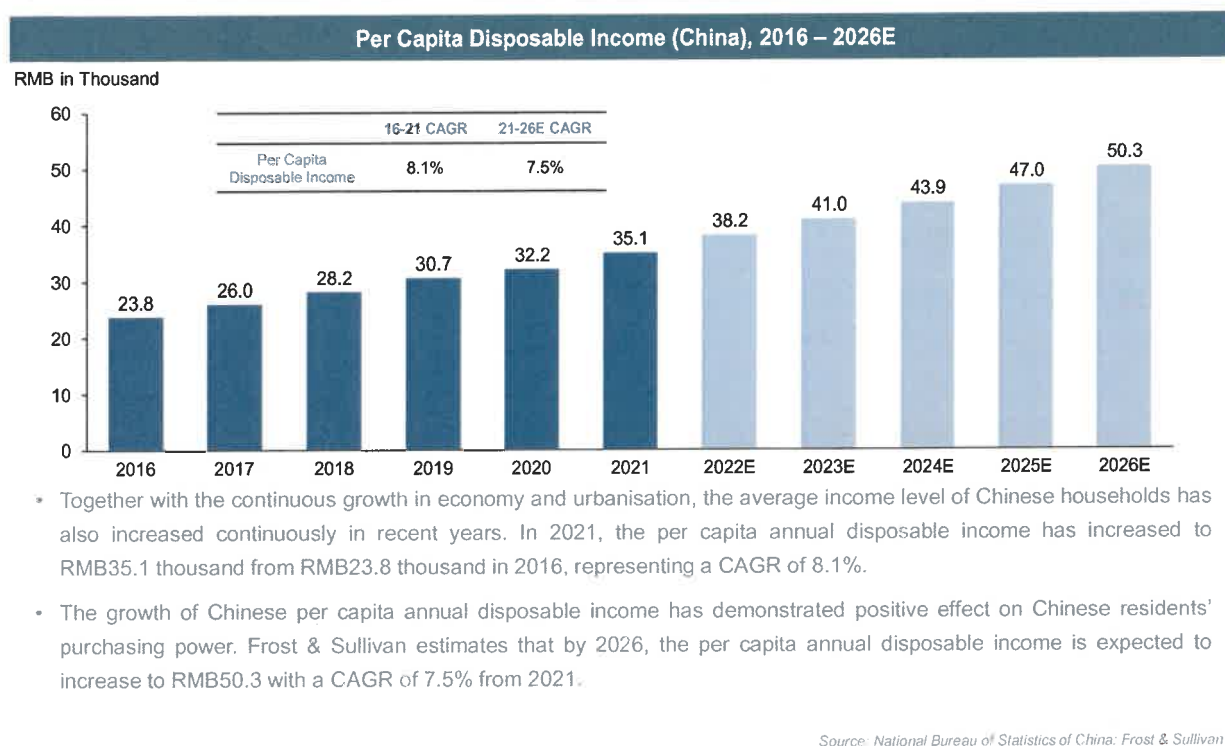
Revenue of Industrial Enterprises above Designated Size (China), 2016 – 2021



- Industrial value-added in China has remained stable growth from 2016 to 2019. Industrial value-added in China grew from RMB 24.5 trillion in 2016 to RMB31.2 trillion in 2019. During the same period, the industrial value-added in Guangdong increased from RMB3.3 trillion to RMB3.9 trillion. In 2020, the number slightly dropped to RMB31.3 trillion, but resumed growth in 2021, reached Rmb37.3 trillion.
- Revenue of industrial enterprises above designated size in China increased from RMB115.9 trillion in 2016 to RMB127.9 trillion in 2021, representing a CAGR of 2.0%.

Source: National Bureau of Statistics

China's Per Capita Disposable Income

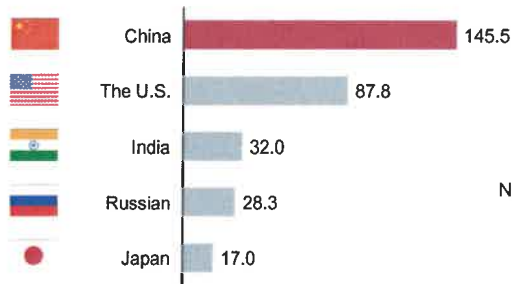


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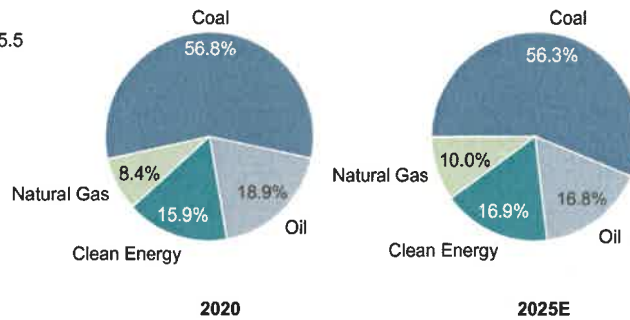
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Energy Consumption of China

Ranking of Primary Energy Consumption (Global), 2020



Primary Energy Consumption (China), 2020, 2025E



Note: 2021 data is not available as at the Latest Practicable Date

- China, the U.S., India, Russian and Japan are the top 5 energy consumption countries in the world, taking up over half of the world's primary energy consumption. China is the largest energy consumption country in the world, taking up approximately 26% of the world's primary energy consumption.
- As the second largest economy in the world, China has huge demand for energy to support the modernization and urbanization. Traditional energy like coal and oil is widely used as fuel and still dominates the primary energy consumption of China. In 2021, consumption of coal and oil accounts for around 55.8% and 19.4% in total primary energy consumption in China.
- Based on the 13th FYP development plan for Energy (《能源发展“十三五”规划》), Frost & Sullivan estimates that, by 2025, coal and oil are still forecasted to maintain their leading position in China's primary energy consumption system in the near future but are likely to decrease to 56.3% and 16.8% in total primary energy consumption. Meanwhile, with the consideration of greenhouse gas emissions and government support, the consumption of clean energy in China is expected to increase to 16.9% of total primary energy consumption.

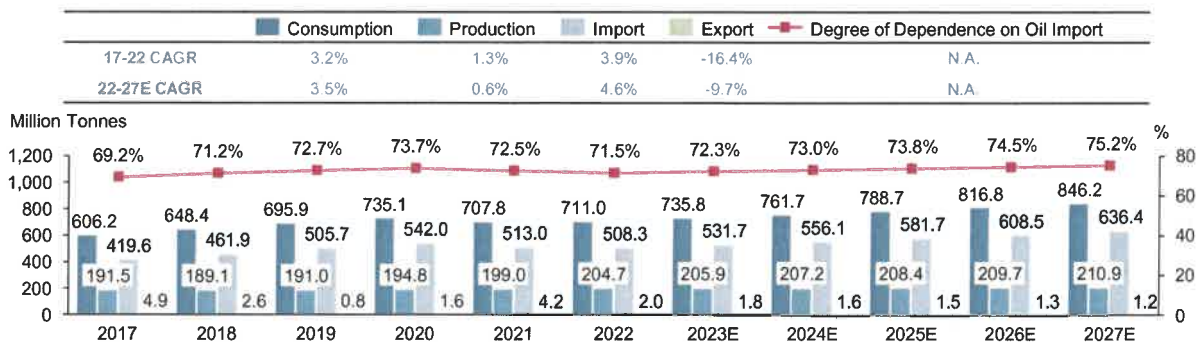
Note: (1) Oil consumption includes crude oil only

(2) Clean energy consumption refers to non-fossil fuel energy, includes nuclear energy, hydroelectricity and other renewables.

Source: BP, National Bureau of Statistics, Frost & Sullivan Analysis

Crude Oil Market Size Overview of China

Crude Oil Market Size Overview (China), 2017 - 2027E



Major oil field in China includes Daqing Oil Field (大庆油田), Liaohe Oil Field (辽河油田), Karamay Oil Field (克拉玛依油田), Shengli Oil Field (胜利油田), etc. The oil production in China had increased from 191.5 million tonnes in 2017 to 204.7 million tonnes in 2022. Given the limited domestic oil reserve, China depends largely on import of oil. Major countries that China import oil from are Russia, Saudi Arabia and Angola. From 2017 to 2022, the oil import in China increased from 419.6 million tonnes to 508.3 million tonnes, representing a CAGR of 3.9% during the same period.

From 2022 to 2027, according to the PRC government's energy plan, China's annual oil production volume is expected to maintain at the level of around 200 million tonnes, oil production volume is estimated to be at a CAGR of 0.6%. Meanwhile, increasing motor vehicle possessions in China has driven the demand for oil, resulting in continuous growth of oil import volume. The oil import of China is anticipated to reach 636.4 million tonnes in 2027, with a CAGR of 4.6% from 2022 to 2027.

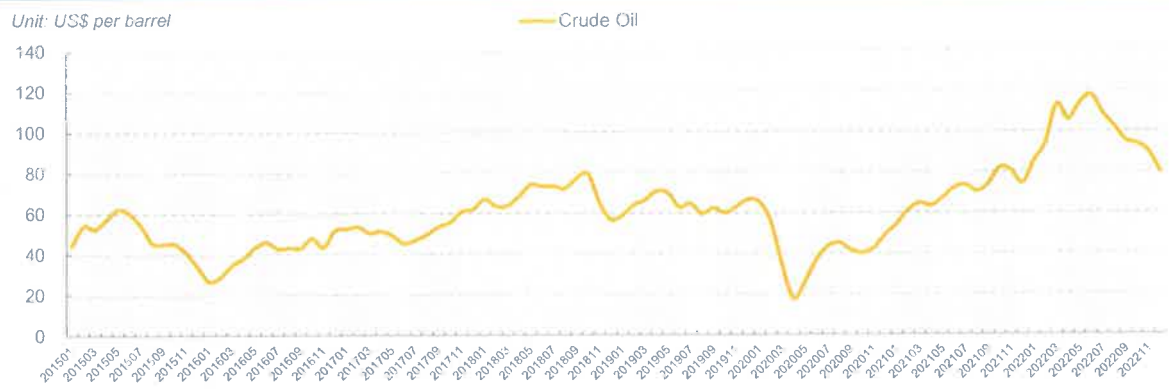
As China itself has limited supply of oil, the import of oil climbs to gain a greater share in total supply. The trend is expected to continue in the Forecast Period. Degree of dependence on import climbed from 69.2% in 2017 to 71.5% in 2022. The figure is expected to reach 75.2% by 2027.

Note: Degree of dependence on import refers to the percentage of oil import as in total oil consumption.

Source: National Bureau of Statistics, Frost & Sullivan Analysis

Crude Oil Price Analysis

Price of Crude Oil (Global), January 2015 – December 2022



- Crude oil price is greatly influenced by some geopolitics factors such as the diplomatic behaviors of major OPEC countries in the world.
- In general, the price of crude oil hovered around US\$40 to US\$80 per barrel during 2015 to 2019. During the period from Jan 2015 to April 2020, the crude oil price showed two slumps in early 2016 and early 2020, respectively. The downward trend in early 2016 was mainly due to the increasing production of shale oil in U.S. Since 1 January 2020, the international market oil price has been experiencing a plummet after OPEC's failure to strike a deal with its allies on the output cut in March 2020 and Saudi Arabia's reaction intensified the situation by way of cutting oil prices and boosting production. The global outbreak of COVID-19 pandemic also restrained the demand of crude oil, which further intensified oil supply and demand imbalance. In April 2020, crude oil price plummeted to below US\$20 per barrel. The crude oil price started to rebound since May 2020 due to the rebalancing of oil supply and demand along with world's top oil producers such as Saudi Arabia, UAE and Kuwait ended their voluntary extra oil production since May 2020. The crude oil price peaked at US\$108.5 per barrel in July 2022 and decreased since then.

Note: tax is excluded for the crude oil price issued by OPEC.

Sources: OPEC, Frost & Sullivan Analysis

Crude Oil Classification

- Crude oil is referred to as either light, medium, or heavy, based on its density. The American Petroleum Institute gravity, commonly shortened to API gravity, compares the density of crude to water. An API gravity higher than 10 means the oil is less dense than water and will float on it. An API gravity lower than 10 means the oil is denser than water and will sink in it. When referring to oil, an API gravity greater than 31.1 degrees is considered light. An API gravity between 22.3 degrees and 31.1 degrees is considered medium. An API gravity between 10.0 degrees and 22.3 degrees is considered heavy. Finally, an API gravity of less than 10.0 degrees would be considered extra heavy.
- The following shows the classifications for crude oil density:

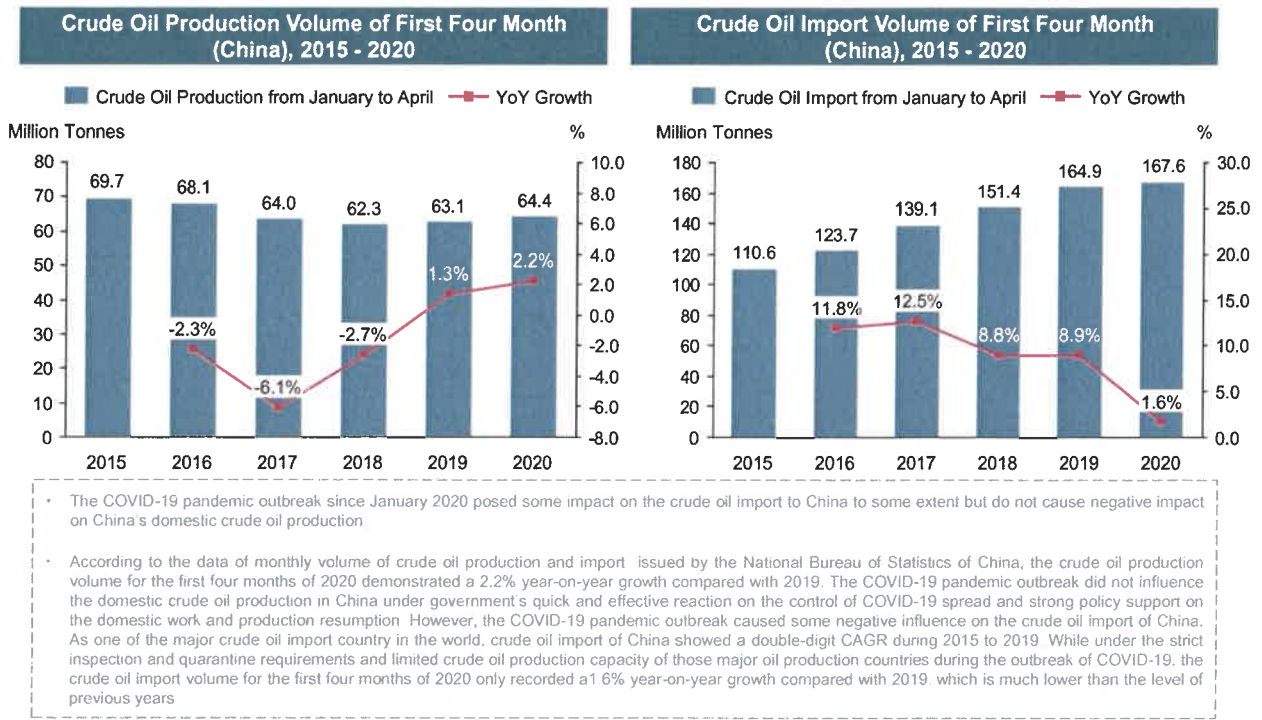
Crude Oil Type	API Gravity Range
Extra Heavy Oil	Below 10.0°
Heavy Oil	10.0° ~22.3°
Medium Oil	22.3° ~31.1°
Light Oil	Above 31.1°

- Crude oil can also be referred to as sour or sweet, based on the sulfur content of the unrefined oil. Determining the sulfur content in crude oil is an important assessment of quality. Sulfur must be removed when refining crude. If it is not, when released into the atmosphere, it can cause pollution and acid rain. Furthermore, high sulfur content can lead to the degradation of metals used in the refining process. When working with crude that contains hydrogen sulfide, it can also be dangerous because it poses a breathing hazard. Crude oil with a sulfur content greater than 0.5% is considered sour; less than 0.5% is sweet.
- The following shows the classifications for crude oil sulfur content:

Crude Oil Type	Sulfur Content
Sour Oil	Above 0.5%
Sweet Oil	Below 0.5%

Sources: American Petroleum Institute, Frost & Sullivan Analysis

COVID-19 Impact on the Crude Oil Production and Import



Source: National Bureau of Statistics, Frost & Sullivan Analysis

COVID-19 Impact on the Production and Sales of Oil Products

COVID-19 Impact on the Production of Oil Products

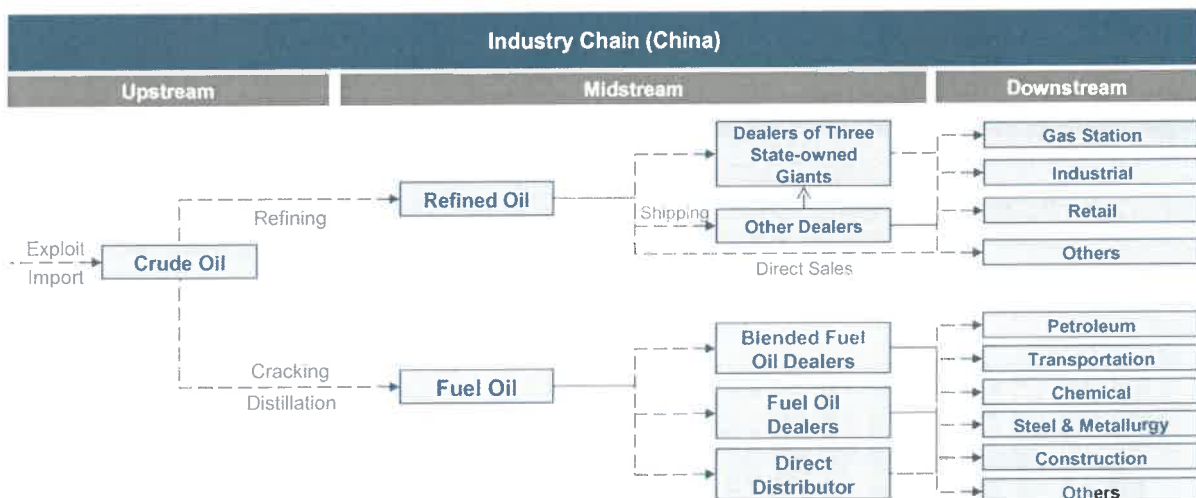
- The COVID-19 pandemic outbreak since January 2020 posed some temporary impact on the production and consumption of oil products (such as refined oil and fuel oil) in China to some extent but the production and consumption of oil products in China is expected to get back to normal in the following years along with the effective control of COVID-19 pandemic under strict anti-epidemic measures implemented by the PRC governments.
- The impact on the production and consumption of oil products in PRC caused by COVID-19 pandemic was mainly due to the temporary shut down of oil refineries as well as the nationwide lockdown in the PRC for the control of COVID-19 pandemic in the first quarter of 2020. However, along with government's active promotion of work resumption and effective control of the pandemic since March 2020, the impact on the production and consumption of oil products in PRC caused by COVID-19 is estimated to be dribble away in the long term.

Source: Frost & Sullivan Analysis

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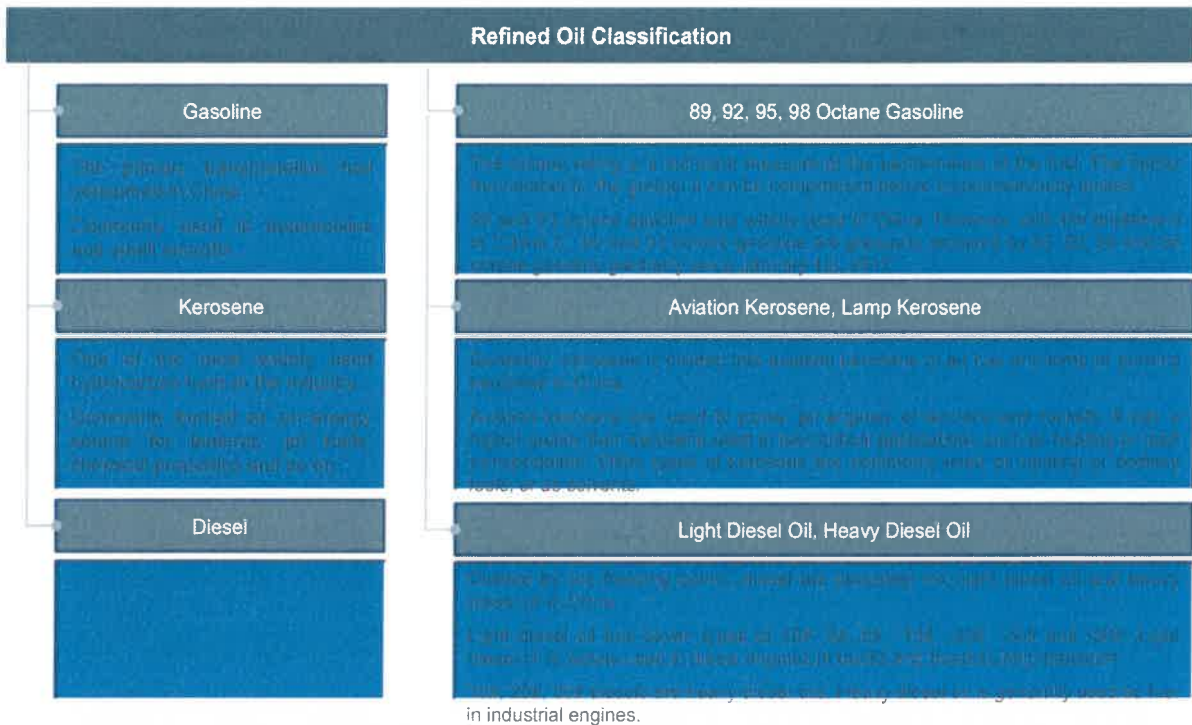
Introduction of Refined Oil Industry Chain



- Refined oil mainly refers to gasoline, kerosene and diesel in China. Gasoline, kerosene and diesel are a hydrocarbon compounds extracted as liquid from refined petroleum. Gasoline and diesel are mainly used as engine fuels, while kerosene is widely used as lamp and lighting fuel, heating fuel, chemical properties and so on.
- Major refining manufacturers and dealers of refined oil in China are China National Petroleum Corporation (CNPC), China Petrochemical Corporation (Sinopec) and China National Offshore Oil Corporation (CNOOC). Other dealers mainly act as suppliers of the three major dealers rather than sell products directly to downstream markets.
- Midstream dealers play an important role in the value chain of the refined and fuel oil industry. This is primarily because dealers have the logistics, storage, processing and network capability to facilitate prompt delivery of refined and fuel oil products from a large number of producers to numerous and dispersed downstream distributors. This can relieve the burden of upstream producers the effort to arrange products delivery and payment collection from downstream players, and focus their resources on refining, research and development and sourcing of raw materials for their products.

Source: Frost & Sullivan Analysis

Classification of China's Refined Oil

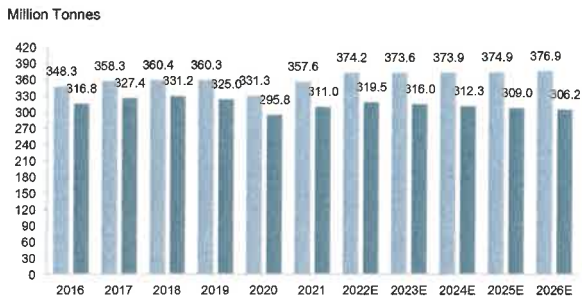


Note: API refers to the American Petroleum Institute. SAE refer to the Society of Automotive Engineers. Source: Frost & Sullivan Analysis.

Refined Oil Production and Consumption in China and Guangdong Province

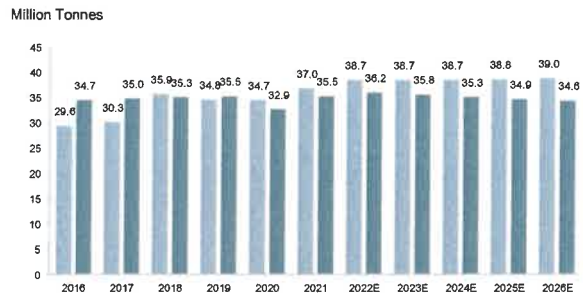
Refined Oil Production and Consumption (China), 2016 – 2021E

	16-21 CAGR	21-26E CAGR
Production	0.5%	1.1%
Consumption	-0.4%	-0.3%



Refined Oil Production and Consumption (Guangdong Province), 2016 – 2026E

	16-21 CAGR	21-26E CAGR
Production	4.5%	1.1%
Consumption	0.5%	-0.5%



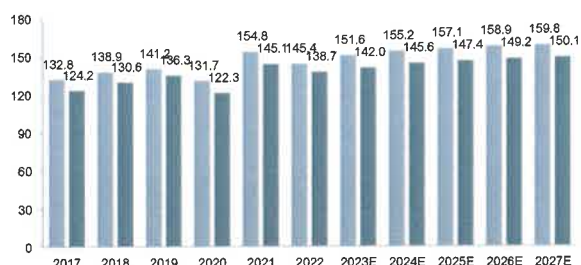
Source: National Bureau of Statistics, Frost & Sullivan Analysis.

Gasoline Production and Consumption in China and Guangdong Province

Gasoline Production and Consumption (China), 2017 – 2027E

	17-22 CAGR	22-27E CAGR
Production	1.8%	1.9%
Consumption	2.2%	1.6%

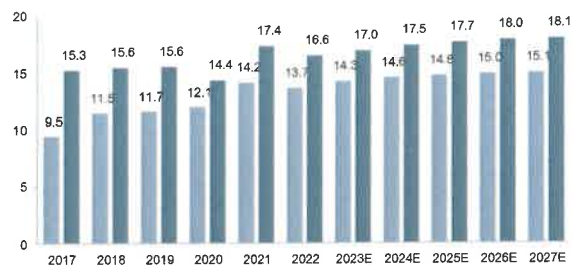
Million Tonnes



Gasoline Production and Consumption (Guangdong Province), 2017 – 2027E

	17-22 CAGR	22-27E CAGR
Production	7.6%	2.0%
Consumption	1.6%	1.7%

Million Tonnes



- Consumption of gasoline in the PRC grew at a CAGR of approximately 2.2% during the period from 2017 to 2022, whereas the production grew at a CAGR of approximately 1.8% for the same period.
- In Guangdong Province, consumption grew at a CAGR of approximately 1.6% during the period from 2017 to 2022, whereas the production grew at a CAGR of approximately 7.6% for the same period.
- The market of gasoline markets slightly dropped in 2020 due to the limitation of transportation in China and Guangdong in the first several months caused by the spread of the COVID-19 pandemic. As the outbreak of the COVID-19 pandemic is largely controlled in China, the gasoline markets are not likely to be strongly impacted in a long run.

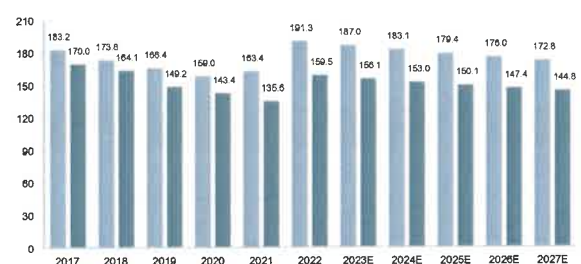
Source: National Bureau of Statistics, Frost & Sullivan Analysis

Diesel Production and Consumption in China and Guangdong Province

Diesel Production and Consumption (China), 2017 – 2027E

	17-22 CAGR	22-27E CAGR
Production	0.9%	-2.0%
Consumption	-1.3%	-1.9%

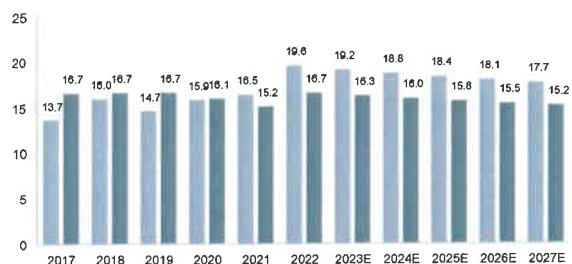
Million Tonnes



Diesel Production and Consumption (Guangdong Province), 2017 – 2027E

	17-22 CAGR	22-27E CAGR
Production	7.4%	-2.0%
Consumption	0.0%	-1.9%

Million Tonnes



- Consumption of diesel in the PRC decreased at a CAGR of approximately -1.4% between 2017 and 2022. Meanwhile, production of diesel increased at a CAGR of approximately 0.9% over the same period.
- From 2017 to 2022, production of diesel in Guangdong Province grew from approximately 13.7 million tonnes to approximately 19.6 million tonnes, while the consumption of diesel was stable at approximately 16.7 million tonnes during the same period.
- The market of diesel in China is forecasted to show a decreasing trend mainly due to the growing awareness of environmental protection. COVID-19 is not likely to impact the market of diesel in China and Guangdong Province.

Source: National Bureau of Statistics, Frost & Sullivan Analysis

Kerosene Production and Consumption in China and Guangdong Province

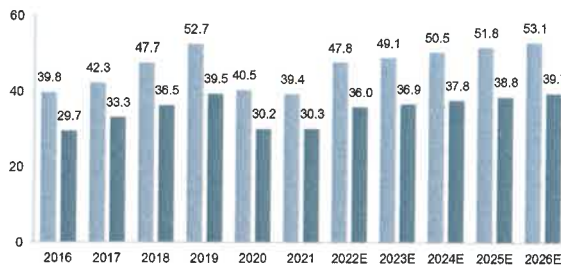
Kerosene Production and Consumption (China), 2016 – 2026E

	16-21 CAGR	21-26E CAGR
Production	-0.2%	6.1%
Consumption	0.4%	5.6%

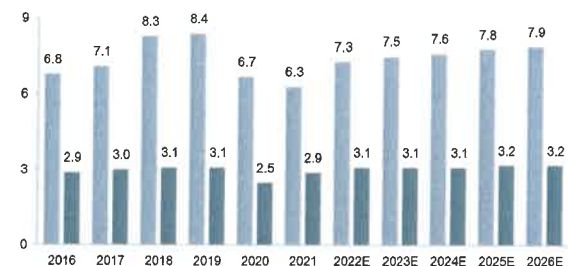
Kerosene Production and Consumption (Guangdong Province), 2016 – 2026E

	16-21 CAGR	21-26E CAGR
Production	0.8%	1.9%
Consumption	-2.3%	4.5%

Million Tonnes



Million Tonnes



- Kerosene is commonly used to power jet engines of aircrafts or as fuel for cooking and lighting. The consumption of kerosene in the PRC increased from 29.7 million tonnes in 2016 to 39.5 million tonnes in 2019, representing a CAGR of approximately 10.0% and outpaced production at a CAGR of approximately 9.8% for the same period.
- The production of kerosene in Guangdong province increased from 6.8 million tonnes to 8.4 million tonnes during the same period.
- In 2020, the production and consumption of kerosene dropped sharply mainly due to the decline of aviation industry caused by the outbreak of COVID-19. The market is expected to gradually recover in a long term as the pandemic is largely controlled in China.

Source: National Bureau of Statistics, Frost & Sullivan Analysis

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Drivers of China Refined Oil Market

Key Market Drivers

- 1 Growing Automobile Population
- 2 Developing Aviation Industry
- 3 Stricter Vehicle Emission Standard



KEY MARKET DRIVERS

Major Driver	Description
Growing Automobile Population	With increasing disposable income and urbanization, a growing number of residents in the PRC are able to afford vehicles. As automobile industry is a major downstream market of both gasoline and diesel, growing automobile population in China is expected to drive the growth of refined oil consumption in the next few years.
Developing Aviation Industry	The aviation industry has developed rapidly during the past years. The airfreight turnover reached 129.3 billion ton-kilometers and the passenger turnover reached 1,170.5 billion person-kilometers passengers in 2019, both showed CAGRs over 10% during 2015 to 2019. Though the airfreight turnover dropped in 2020 due to the spread of COVID-19, the industry is expected to recover as the pandemic is largely controlled in China. In the coming future, in line with the growing economy, the aviation industry is expected to keep this growing trend and hence drive the kerosene market.
Stricter Vehicle Emission Standard	As environmental issues, especially air pollution, has been of great concern in China, stricter vehicle emission standard is expected to be imposed. Limits and measurement methods for emissions from light-duty vehicles (China 5) has been imposed nationwide and China 6 has been gradually implemented since 2020. Stricter standard has driven the market for upgraded products which is more expensive, and hence driving the market in terms of revenue.

Source: Frost & Sullivan Analysis

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Drivers of Guangdong Refined Oil Market

Key Market Drivers

- 1 Growing PV Population
- 2 Development of Industry
- 3 Promotion of the Belt and Road Strategy



KEY MARKET DRIVERS

Major Driver	Description
Growing PV Population	Guangdong has one of the largest passenger vehicles population in China among all provinces. In 2022, the passenger vehicles population in Guangdong was 25.0 million, increased from 16.8 million in 2017. The possession of passenger vehicles in the Guangdong Province from 2017 to 2022 grew at a CAGR of approximately 8.3% and the growing trend of the passenger vehicle market in Guangdong Province is expected to continue.
Development of Industry	The consumption of refined oil in Guangdong was relatively concentrated, with Pearl River Delta accounting for a rather high market share. According to the 13 th Five-Year-Plan of Guangdong Province, the development of industrial zones in cities other than Pearl River Delta will also be strongly supported by the government. The potential development of industry is likely to strengthen the demand of energies including refined oil.
Promotion of the Belt and Road Strategy	Guangzhou has been one of the pivot cities in China. With the nationwide promotion of the Belt and Road Strategy, Guangdong is likely to become an increasingly important transportation centre in China. The boosting vehicle flow rate is expected to drive the gasoline and diesel oil market in Guangdong. Also, the local government has issued Implementation Scheme of Guangdong's Participation in the Construction of "One Belt, One Road" in June 2015. The local government has invested over US\$55 billion to improve the construction of six major industries including infrastructure, energy, manufacturing industry.
Favorable Policies	Though the production volume of refined oil in Guangdong is rather high, half of the refined oil products are sold to other provinces. Hence, Guangdong's refined oil consumption market highly relies on other places such as Shandong. In order to ensure the economic development in Guangdong, the local government encourages the wholesale of refined oil. According to the 13 th Five Year Plan for the Refined Oil Distribution System in Guangdong (《广东省成品油配送体系“十三五”规划》) issued in January 2017, oil depots with a total storage capacity of 4.9 million cubic meters would be established in Guangdong during the period from 2016 to 2020 in order to ensure the supply of refined oil in the province. The support from the local government is likely to drive the market.

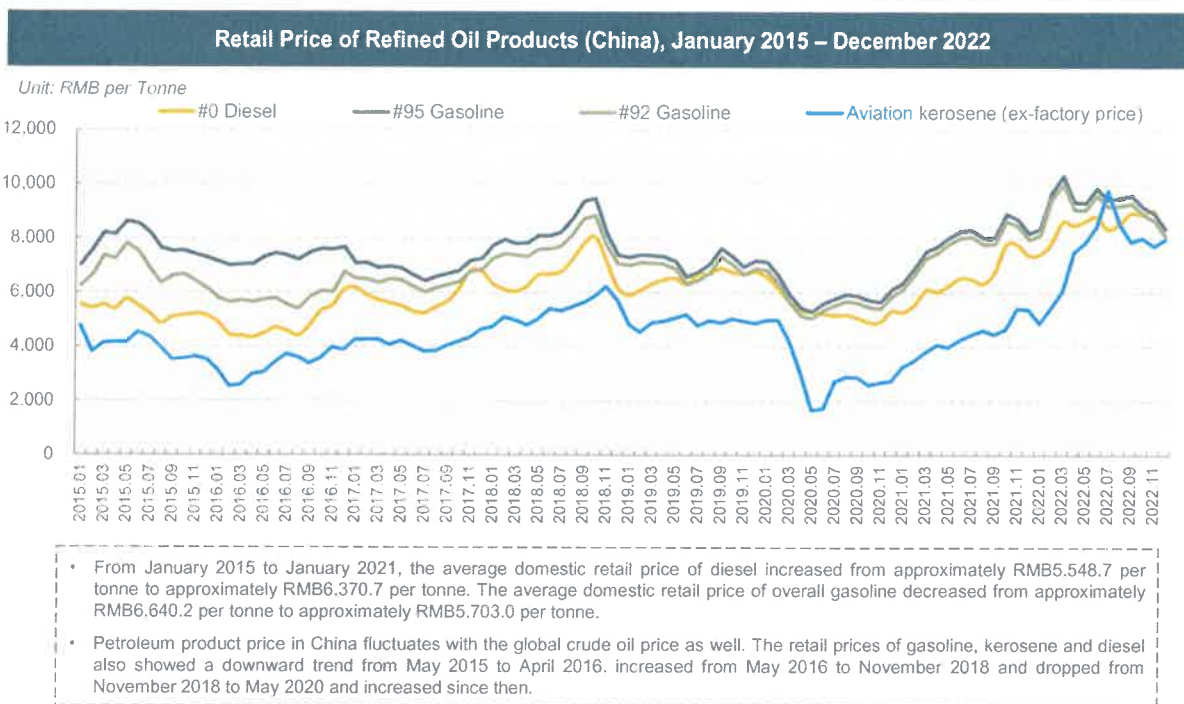
Source: Frost & Sullivan Analysis

Policies and Regulations of China's Refined Oil Market

Law/Measures	Enacted/Implemented by	Effective Date
Limits and measurement methods for emissions from light-duty vehicles (CHINA 5) 《轻型汽车污染物排放限值及测量方法（中国第五阶段）》	Ministry of Environmental Protection of the PRC 中华人民共和国环境保护部	2016 Jan
Stipulates the requirements for the type-approval as well as the examination and judgment over the production conformity and in-use compliance for the exhaust of light-duty vehicle for Phase V.		
Announcement on Issuing Declaration Requirements, Allocation Principles and Relevant Procedures for Permitted Quantities of Imported Refined Oil (Fuel Oil) from Non-State Trading in 2016 《2016年成品油（燃料油）非国营贸易进口允许量申领条件、分配原则及相关程序》	Ministry of Commerce 中华人民共和国商务部	2015 Dec
Opens the restrictive policies of importing refined oil. Lists the standards of qualified enterprises of refined oil trading.		
Petrochemical and Chemical Industry Development Plan (2016-2020) 《石化和化学工业发展规划》	Ministry of Industry and Information Technology of the People's Republic China 中华人民共和国工业和信息化部	2015 Dec
During "Thirteenth Five-Year Plan" period, it is required that the petrochemical and chemical industries must accelerate adjustment and upgrading, including the development of high-grade refined oil.		
Opinions of the General Office of the State Council on Strengthening Energy Conservation and Emission Reduction in the Internal Combustion Engine Industry 《国务院办公厅关于加强内燃机工业节能减排的意见》	The State Council 中华人民共和国国务院	2013 Feb
To develop internal combustion engines and increase the efficiency of gasoline and diesel.		

Source: Frost & Sullivan Analysis

Price Trend of Major Products



Note: tax is included for the above price of gasoline, kerosene and diesel.

Sources: Bureaus of Statistics, Frost & Sullivan Analysis

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Price Trend of Major Products

In China, retail and wholesale prices of gasoline and diesel, as well as the price of gasoline and diesel supply prices for social wholesale enterprises, railway, transport and other special users shall be government-guided. The National Development and Reform Commission (NDRC) would timely adjust guiding prices when fluctuations in international crude prices cause a change of more than RMB50 per tonne of gasoline or diesel within the period of ten working days. Such pricing system takes into account the varieties of crude oil used to calculate the price changes. In addition, retail price of refined oil products will not be raised if international crude oil prices rise above US\$130 per barrel, or cut if prices fall below US\$40 per barrel.

According to the Circular of the National Development and Reform Commission ("NDRC") on Issues concerning Further Improving the Refined Oil Pricing Mechanism (Annex: Administrative Measures for Oil Prices) (Fa Gai Jia Ge[2016]No. 64) (國家發展改革委關於進一步完善成品油價格形成機制有關問題的通知。附：石油價格管理辦法。[發改經體[2016]64號]) issued by the NDRC in 2016, the NDRC has set lower limit for price adjustment mechanism of refined oil. The lower limit was set to be US\$40 per barrel. Namely, when crude oil price in the international market to which the domestic refined oil prices is affiliated is lower than US\$40 per barrel, the domestic refined oil prices shall no longer be adjusted to fall.

If the crude oil price in the international market lingers lower than US\$40 per barrel in a long-term, the business operation and gross profit of petroleum refuelling station operators in the PRC are expected to remain stable as (1) the refined oil procurement cost shall be fixed with reference to the US\$40 per barrel price floor; and (2) the wholesale and retail prices of refined oil products shall also be fixed with reference to the ceilings set by the NDRC. Based on the above, it would not pose any adverse and material impact to the operators of petroleum refuelling stations.

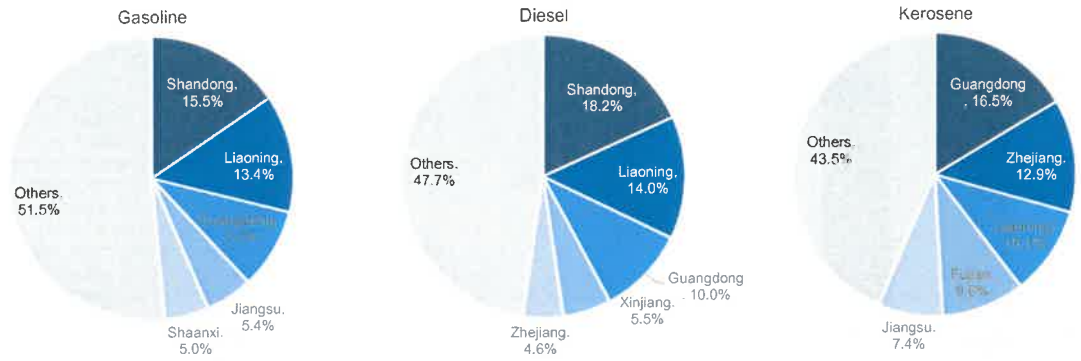
Sources: Bureaus of Statistics, Frost & Sullivan Analysis

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Production Breakdown by Provinces in China

Major Production Provinces of Refined Oil Products (China), 2020

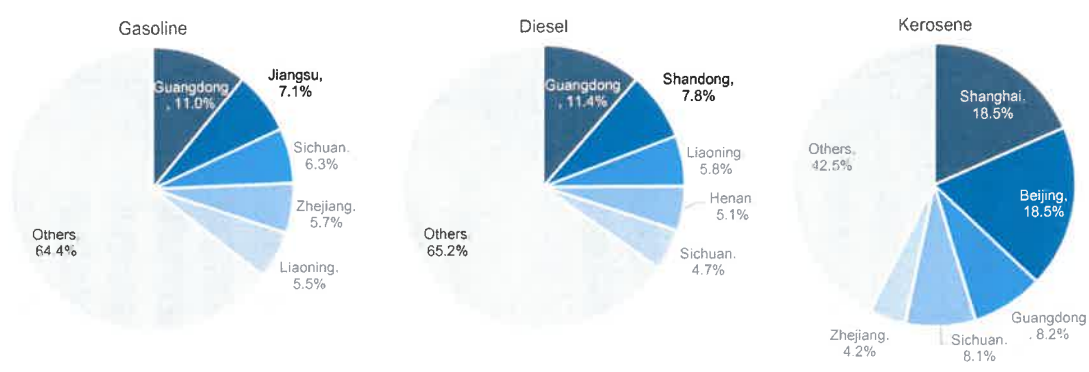


- Shandong is the largest production base of both gasoline and diesel in China, followed by Liaoning and Guangdong at the second and third place, respectively.
- Guangdong is the largest production base of kerosene in China in 2020, accounting for approximately 16.5% of the total production in China
- In 2021, Liaoning Province and Guangdong Province was the second and third largest production base, respectively, of both gasoline and diesel in China.

Source: National Bureau of Statistics

Major Consumer Markets in China

Major Consumer Markets of Refined Oil Products (China), 2020

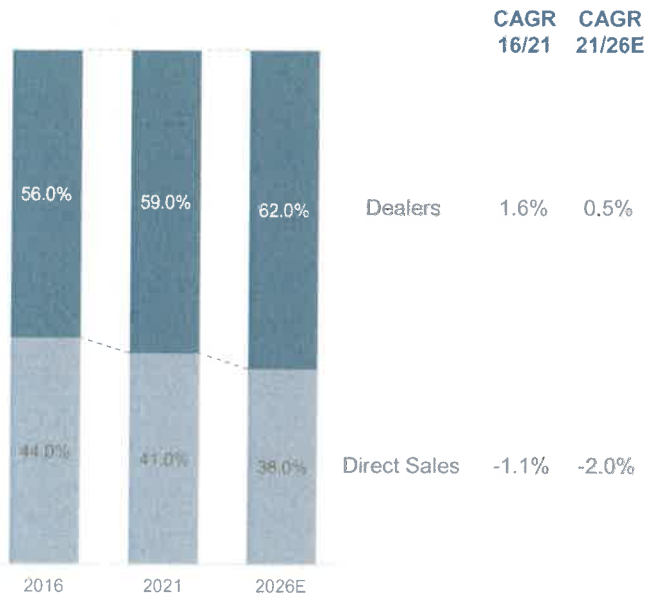


- With the largest passenger vehicle (PV) population in China, the consumption of gasoline and diesel in Guangdong province leads the national market with an occupation of 11.0% and 11.4%, respectively.
- As for kerosene, Shanghai, Beijing, Guangdong, Sichuan and Zhejiang ranked from the first to the fifth place, respectively. Together the five accounted for nearly 60% of the total market in 2020.
- Guangdong Province had the largest consumption of gasoline and the second largest consumption of diesel among all provinces in the PRC in 2021.

Source: National Bureau of Statistics

Distribution and Sales Channel

Sales Breakdown of Refined Oil (China), 2016, 2021, 2026E



- Direct sales refers to the sales from the three state-owned giants and local refineries. Direct sales accounted for approximately 41.0% of the total sales in 2021.
- Sales through dealers accounted for around 59.0% of total sales in 2021. As dealers are the most important sales network in the refined oil industry, dealers has taken a growing percentage in the sales and is expected to continue growing in the future. Dealers include both dealers of the three giants and private dealers. Private dealers accounted for approximately a quarter of the dealers' market. Private dealers play as traders who connect private refiners with local NOC dealers and retailers. Hence, private dealers are becoming increasingly important in particular regions including Guangdong, since the growth rate of refined oil consumption is higher than that of production. Dealers consist of dealers of the Three State-owned Giants and private dealers, the latter accounting for around a quarter of the dealers' market.
- Major manufacturers of refined oil in China are the three giants CNPC, Sinopec and CNOOC. The three giants generally provide refined oil products to their own wholesalers or directly to the industries. Local refineries provides approximately a quarter of the country's refined oil products. Private dealers purchase refined oil products from local refineries and resell the products either to the state-owned dealers or to private gas stations.

Source: Frost & Sullivan Analysis

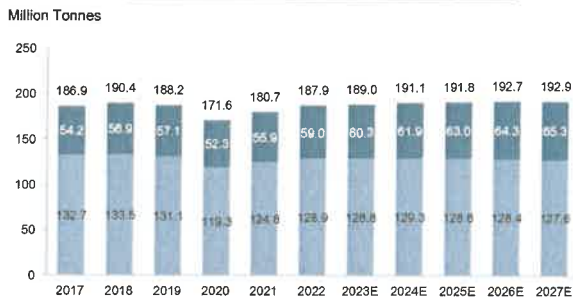
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Trading Market of Refined Oil in China and Guangdong Province

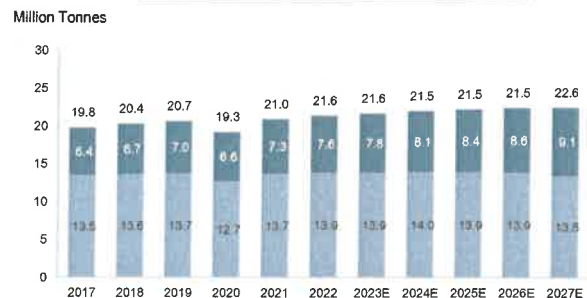
Refined Oil Trading Market (China), 2017 – 2027E

	17-22 CAGR	22-27E CAGR
Total	0.1%	1.3%
SOEs	-0.7%	0.6%
Private Enterprises	2.1%	2.8%



Refined Oil Trading Market (Guangdong Province), 2017 – 2027E

	17-22 CAGR	22-27E CAGR
Total	1.7%	1.0%
SOEs	0.6%	-0.6%
Private Enterprises	3.5%	3.7%



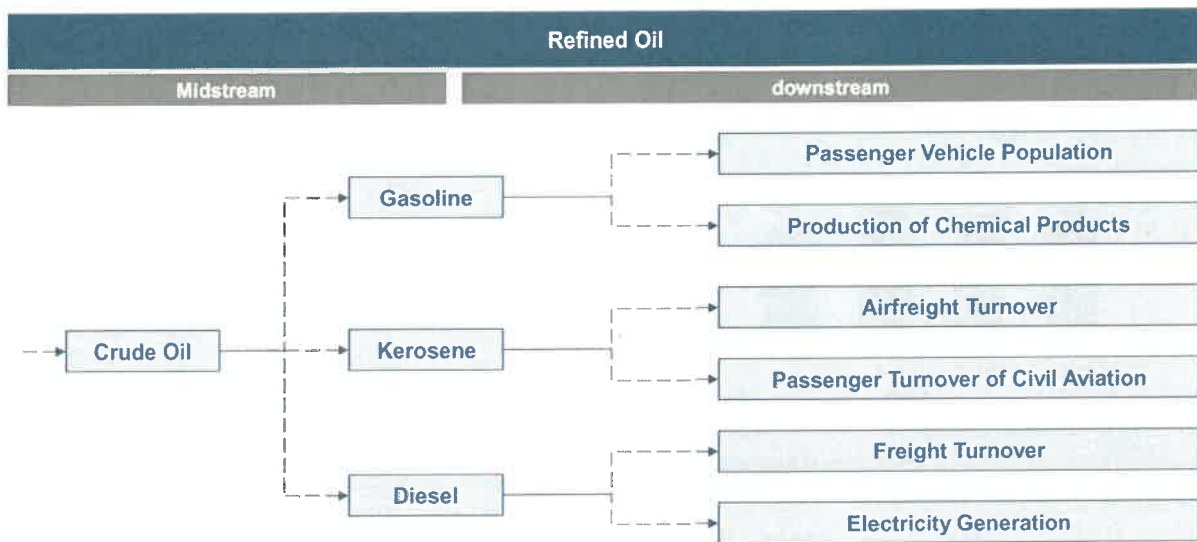
- The refined oil trading market in China increased from 186.9 million tonnes in 2017 to 187.9 million tonnes in 2022, representing a CAGR of approximately 0.1%. In 2022, the trading volume of private enterprises accounted for approximately 31.4% of the total trading market.
- In 2022, the trading volume of private enterprises accounted for approximately 35.3% of the total trading market in Guangdong Province. The segment increased from 6.4 million tonnes in 2017 to 7.6 million tonnes in 2022 at a CAGR of approximately 3.5%. The market is affected by the spread of COVID-19 in the first several months in 2020 due to the lockdown of cities in China. However, COVID-19 has been largely controlled in China along with government's strict quarantine and prevention measures and is not expected to affect the long-term market in Guangdong Province and the rest of China.
- The growth of the refined oil trading market in Guangdong Province from 2022 to 2027 is expected to slowdown compared to that of 2017 to 2022, as the macro economy growth of Guangdong Province is expected to slowdown during the same period comparing to that of 2017 to 2022. In addition, the trading volume of SOEs is expected to witness a decrease from 2022 to 2027, slowing down the overall market growth while the private enterprises sector is still expected to have a steady growth from 2022 to 2027 with a CAGR of 3.7%.
- The growth of refined oil trading market in Guangdong Province and China are expected to slow down, which can be attributed to several reasons. Firstly, China is focusing on transitioning towards cleaner energy resources such as solar and hydro, the shift could lead to a decline in demand for refined oil products. Secondly, the share of new energy vehicle among all passenger cars has grown rapidly in China, as more electric cars hit the roads, the demand for gasoline and other refined oil products could decline. Lastly but not least, China has been increasing the environmental regulations to curb pollution, these regulations could lead to a decrease in the consumption of refined oil products, which would impact the growth rate of the refined oil market.

Source: National Bureau of Statistics, Frost & Sullivan Analysis

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Major Downstream Market Development



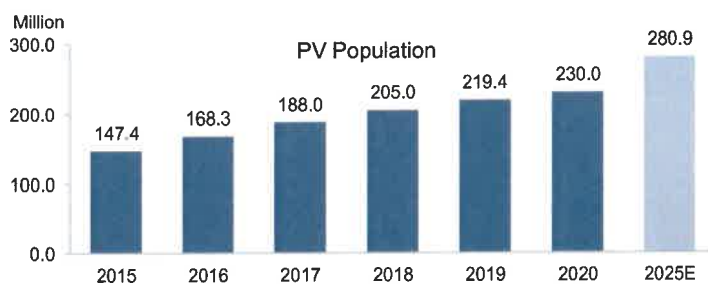
- The consumption of diesel in China is the largest among the three products, followed by gasoline. Kerosene consumption is relatively limited.
- Major downstream industries include automobile industry, aviation industry, chemical industry and so on.

Note: Data of 2016 will be updated when National Bureau of Statistics issues relevant economic data

Source: Frost & Sullivan Analysis

Development of Major Downstream Market

Major Downstream of Gasoline – Automobile Industry



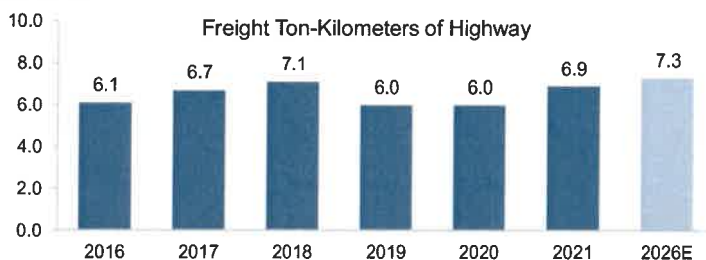
- The sales volume of passenger vehicles grew from 2015 to 2018, rising from 28.7 million unit in 2015 to 34.9 million unit in 2018. Though the market drop slightly in 2019 and 2020, it is expected that the number would increase to 39.3 million by 2025 due to the growing purchasing power of Chinese residents, continuous consumption structure upgrading and growing acceptance of PV purchase by loans or financing.
- With growing income, possession of passenger vehicles has grown from 147.4 million unit in 2015 to 230.0 million unit in 2020, and is expected to reach 280.9 million unit.

Sources: National Bureau of Statistics; Frost & Sullivan Analysis

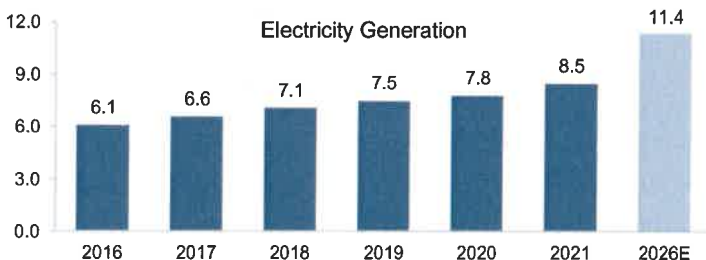
Development of Major Downstream Market

Major Downstream of Diesel – Transportation and Electrical Industry

Trillion Ton-KM



Trillion KWh



- Transportation of freight using trucks are large consumers of diesel. It increased from 6.1 trillion ton-km in 2015 to 7.1 trillion ton-km in 2018. In 2019, the number dropped to 6.0 trillion ton-km as the government encourages railway transportation. Highway transportation is likely to keep stable in the coming years.
- Total electricity generation rose from 6.1 trillion kwh in 2016 to 8.5 trillion kwh in 2021. With the "Road and Belt" initiation and the warm-up in industrial production owing to the reduced capacity and rising PPI, the electricity generation is expected to rise in the forecast period. By 2026, the electricity generation is expected to reach 11.4 trillion kwh.

Sources: National Bureau of Statistics, Frost & Sullivan Analysis

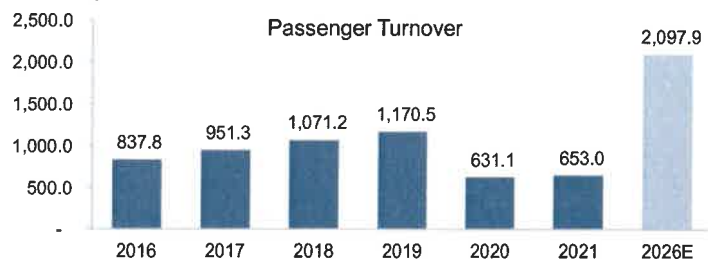
Development of Major Downstream Market

Major Downstream of Kerosene – Aviation Industry

Billion Ton-KM



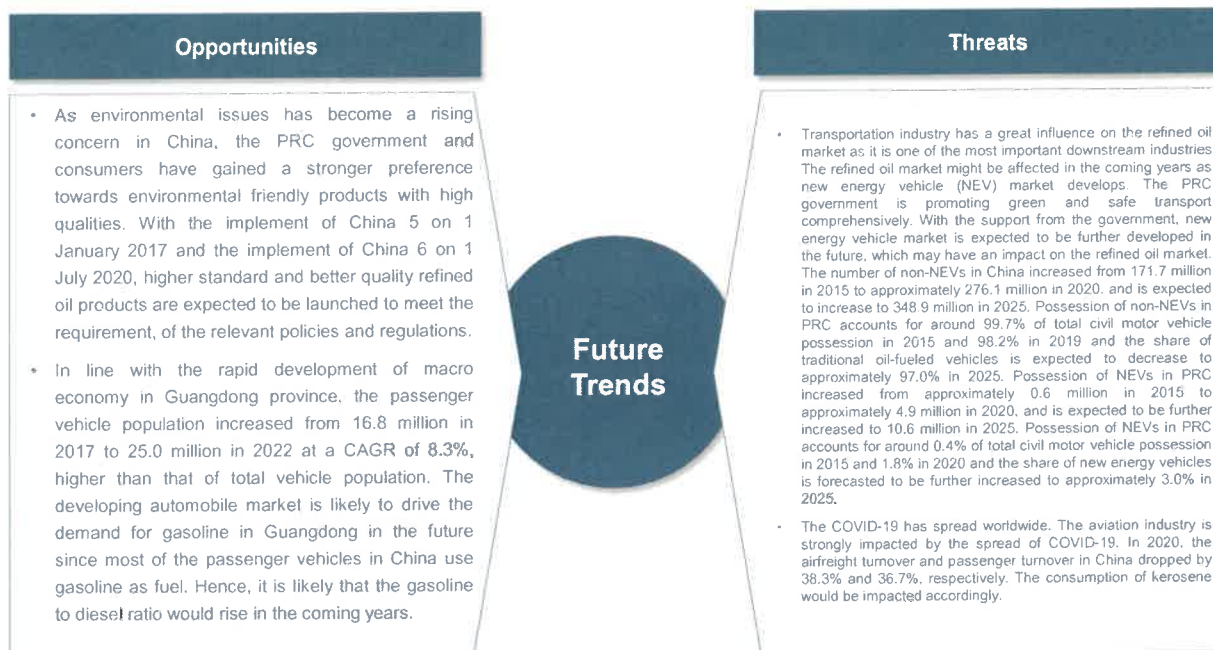
Billion Passenger-KM



- In line with the fast development of macro-economy, the civil aviation in China witnessed a rapid expanding during the past several years from 2015 to 2019.
- The airfreight turnover grew from 85.2 billion ton-kilometers in 2015 to 129.3 billion ton-kilometers in 2019. Though the market dropped in 2020 due to the spread of COVID-19, it is expected that the number would grow to 208.2 billion ton-kilometers in 2025.
- The total passenger turnover increased in the past 5 years from 728.3 billion passenger-kilometers to 1,170.5 billion passenger-kilometers. An increasing number of Chinese residents prefer to choose to fly when traveling due to the growing purchasing power and increasing need of convenience. The passenger turnover of China's aviation industry is expected to reach 1,945.8 billion person-kilometers in 2025.

Sources: National Bureau of Statistics, Frost & Sullivan Analysis

Future Trends of China and Guangdong Refined Oil Market



Source: Frost & Sullivan

Industry Practice

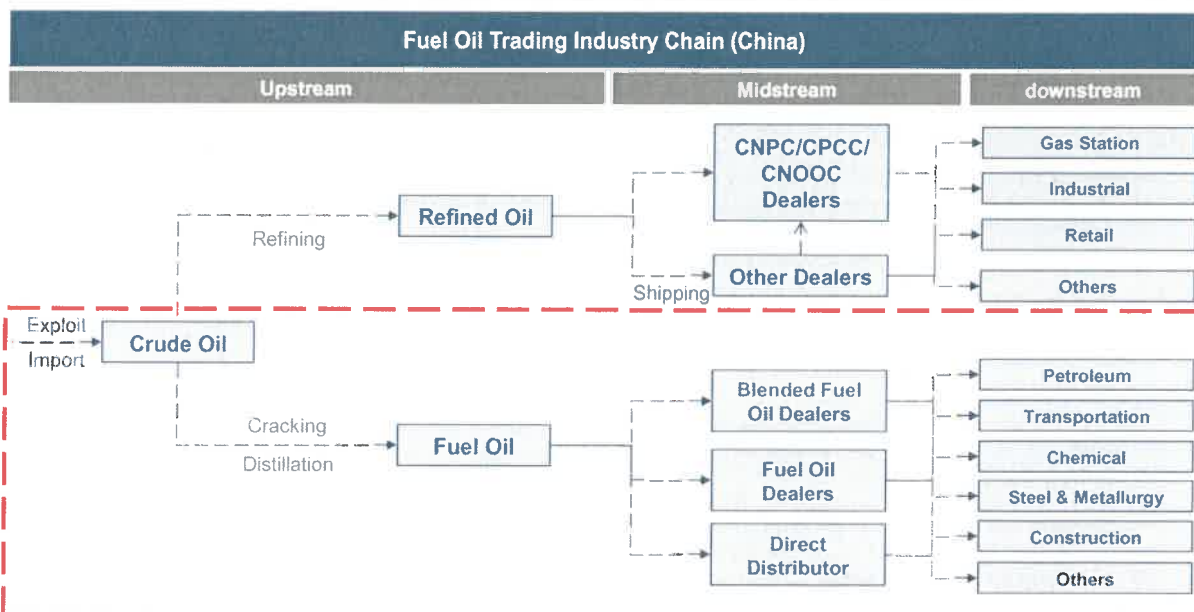
- It is common practice within the oil trading industry in the PRC to source and re-sell oil products.
- Most of the oil depots in Guangdong Province are located at the coastal region.
- For private dealers' Three State-owned Giants customers, although they have upstream refinery operations, they still regularly make additional refined oil procurement from external supply for any shortfall of upstream production to meet the demand of their downstream operations, i.e. gas stations.
- The terms of transactions with the Three State-owned Giants and/or their related group companies (who are also private dealers' suppliers) are in line with market practice, consistent with the industry norm in the PRC oil industry and similar to those transactions with other customers and suppliers of private dealers.
- Guangzhou, Dongguan and Huizhou are the key gasoline consumption cities in Guangdong Province.
- The Group's commission rate net profit margin is in line with the industry norm due to the nature of the industry.
- The Group's service income margin was approximately 3.9% and 2.6% for year ended 31 December 2019 and 31 December 2021 respectively, which were similar to the industry average.
- Using agents between suppliers and customers in the oil trading industry is a common market practice.
- Some suppliers prefer selling oil products to midstream dealers to serve downstream customers as dealers have the logistics, storage, processing and network capability to facilitate prompt delivery of refined and fuel oil products from a large number of producers to numerous and dispersed downstream distributors, which can relieve upstream producers' burden of arranging products delivery and payment collection from downstream players, and allow them to focus their resources on refining, research and development and sourcing of raw materials for their oil products.
- The retail price of gasoline in 2020 was competitive since the retail market was not as affected by the drastic drop in international crude oil price as the wholesale market.
- Outport trade commonly exists in the trading of oil products. The competitors of JTF(PCR) are generally engaged in outport trade.
- In the PRC, the oil retail market was not as affected by the drastic drop in international oil price as the wholesale market because wholesale market is often directly affected by the international oil price while the main driver of retail market is consumer demand, which largely depends on China's domestic socio-demographic changes like transportation and population growth or seasonal changes like residential heating needs.

Source: Frost & Sullivan Analysis

Content

- 1 China's Macro Economy and Oil Market Overview
- 2 China's Crude Oil Market Analysis
- 3 China and Guangdong's Refined Oil Trading Market Analysis
- 4 China and Guangdong's Fuel Oil Trading Market Analysis**
- 5 China and Guangdong's Other Petrochemical Products Trading Market Analysis
- 6 Competitive Landscape Analysis
- 7 Appendix

Introduction of Fuel Oil Trading Industry Chain



Fuel oil is a kind of refined oil, which is mainly obtained from distillation or cracking during the processing of crude oil. Fuel oil usually has high viscosity and affluent with colloid and asphaltene. Fuel oil are generally consumed many industries such as petroleum processing shipping, chemical steel & metallurgy construction materials, etc. Fuel oil is a general term to describe fuel used in furnace and other industrial engines and is a mixture of oil products (distillation residue) produced from crude oil in fractional distillation process. Fuel oil can also be divided into unblended (single grade) and blended (mixed grade) products. Examples of unblended fuel oil products include vacuum residue and slurry oil from oil refineries. Midstream dealers play an important role in the value chain.

Having a relatively high customer churn rate in general whilst continuously procuring new customers conform with the industry NORM in the PR oil industry. Source: Frost & Sullivan Analysis

Introduction of Fuel Oil Distributors

Fuel Oil Dealer

Fuel oil dealers generally refer to those oil dealers who sell low value-added unblended and untreated fuel oil products like vacuum residue (減壓渣油) and slurry oil (油漿) to downstream customers in various industries. Those unblended and untreated fuel oil are normally wholesaled from oil refineries.



Blended Fuel Oil Dealer

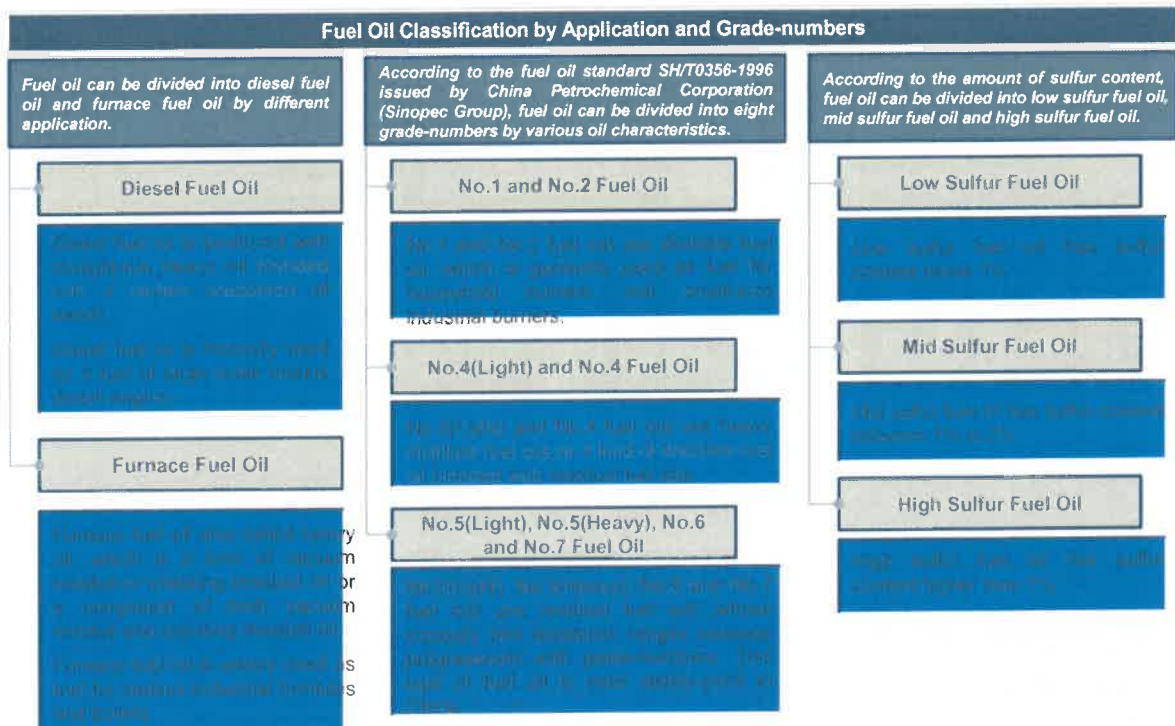
Blended fuel oil dealers refers to those oil dealers who produce and sell blended fuel oil which is composed and blended by more than two kinds of fuel oil products in order to meet various oil product characteristics from downstream clients. The quality of fuel oil directly produced from oil refineries are relatively poor and can hardly meet the furnace burning requirements of some downstream customers. Blended fuel oil dealers have the capability to blend and produce high value-added blended fuel oil and then sell to the targeted customers. In China, blended fuel oil are normally consumed in shipping industry as fuel of ships and vessels, and also some industry furnaces.

Fuel Oil Direct Distributor

Fuel oil direct distributor are generally those affiliated fuel oil traders of oil refineries. They usually directly sell or wholesale those low value-added and untreated fuel oil produced from oil refineries to those large-scale downstream customers and also blended fuel oil dealers. Blended fuel oil dealers purchase untreated fuel oil from fuel oil direct distributor as their blending material for producing blended fuel oil.



Classification of Fuel Oil Products



Source: Shenzhen Petrochemical Exchange, SH/T0356-1996

Blended Fuel Oil Introduction

Definition of Blended Fuel Oil

Blended fuel oil, is the product mix of various kinds of fuel oil. Fuel oils are blended into various combinations to derive the different grades of marine fuel oil, for the specific physiochemical index for the engines of vessels. Blended fuel oil is primarily used as fuel in large-scale shipping vessels and industrial furnaces. The quality of unblended fuel oil sometimes cannot meet burning requirements of these furnaces (i.e. viscosity). Thus two or more kinds of (usually unblended) fuel oil products are blended to alter their physiochemical properties for specific engine use.

Characteristics of Blended Fuel Oil

➤ High Calorific Value

- Blended fuel oil is usually blended under the specific requirements of the downstream clients for the specific physiochemical index of their fuel furnace or engines. Thus, blended fuel oil can achieve complete combustion and produce high calorific value

➤ Low Impurity Content

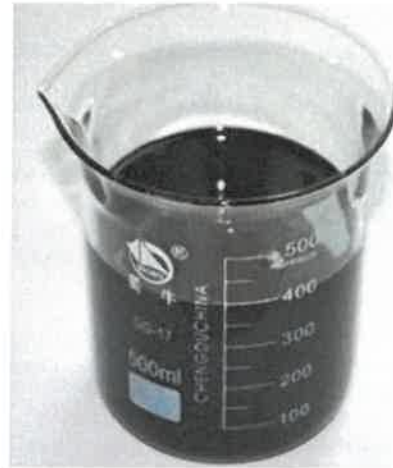
- Blended fuel oil can reduce its impurity content under 0.01% during the blending process

➤ Strong Burning Stability

- Blended fuel oil usually have excellent atomization quality after the precise blending and thus ensure the sufficient air during the combustion, which also guarantee the strong burning stability of blended fuel oil.

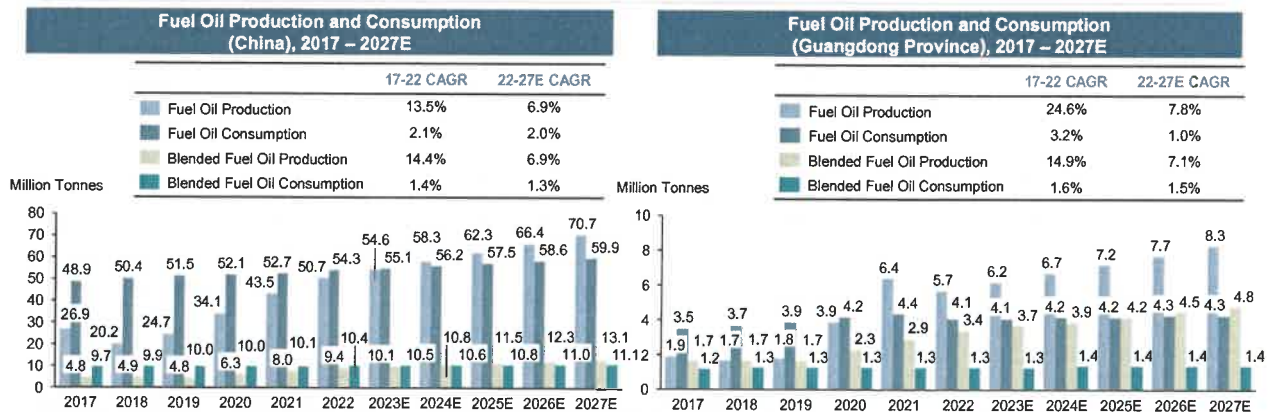
➤ Fewer Low-cost Substitutes

- Unlike other fuels, blended marine fuels has fewer low-cost substitutes such as unqualified blending fuels for its specific physiochemical index provided for marine vessels. In that case, the demand for marine fuels is forecast to keep increasing because of the lack of substitutes



Source: Frost & Sullivan Analysis

Fuel Oil Production and Consumption in China and Guangdong Province



- Consumption of fuel oil in the PRC grew at a CAGR of approximately 2.1% for the period from 2017 to 2022. Such consumption growth was driven by the steady development of major consumption industries (petroleum refining, maritime transportation and chemical). Moreover, consumption in Guangdong Province experienced a CAGR of approximately 3.2% during the same period.
- Consumption of fuel oil in PRC and Guangdong Province are expected to maintain at a stable level from 2022 to 2027 along with substantial development of downstream industries, recovering of industrial production after government's cut-down of overcapacity and promotion of the 'Belt and Road Initiative' strategy. Although the COVID-19 posed impact on the production and consumption of fuel oil in the first half year of 2020 due to the temporary shutdown of industrial enterprises, the consumption of fuel oil got back to normal in the latter half of the year of 2020 along with government's implementation of strict anti-epidemic measures.
- Production of fuel oil in PRC and Guangdong Province recorded a spectacular growth in 2021, with a year-on-year growth of 27.6% and 64.1% respectively. The prominent growth of fuel oil production in PRC and Guangdong in 2021 were mainly due to the rise in domestic production and supply of very low-sulphur fuel oil (VLSFO) in order to meet the International Maritime Organisation's 0.5ppm sulphur cap in marine fuels that took effect in January 2020.
- As a kind of customised blending fuel oil products, blended fuel oil can achieve complete combustion with high calorific value. Blended fuel oil has gradually been well-accepted by the downstream fuel oil consumers who usually have high physiochemical index requirements to the fuel oil products. The consumption of blended fuel oil in PRC increased from 9.7 million tonnes in 2017 to 10.4 million tonnes in 2022 with a CAGR of 1.4%. Guangdong Province is one of the key marine trade provinces in the PRC and accounted for approximately 13% of the blended fuel oil consumption in the PRC during 2017 to 2022. Both consumption and production of blended fuel oil products in Guangdong Province experienced a steady growth with CAGR of approximately 1.6% and 14.9%, respectively, over the same period.
- Blended fuel oil is normally consumed as the fuel of large-scale shipping vessels and industrial furnaces. The demand for blended fuel oil in PRC and Guangdong Province is estimated to be further stimulated in the future along with growing capacity of water transportation as well as the PRC's national strategy of the construction of Guangdong-Hong Kong-Macao Greater Bay Area. According to the Frost & Sullivan Report, the consumption of blended fuel oil in PRC and Guangdong Province is likely to maintain at a stable level from 2022 to 2027. The demand for blended fuel oil was hindered by the global outbreak of the COVID-19 pandemic in 2020, but is forecasted to be gradually resume in the following years after 2020.

Source: National Bureau of Statistics, Frost & Sullivan Analysis

Drivers of China's Fuel Oil Market

Key Market Drivers

- 1 Substantial Development of Downstream Industries
- 2 Recovering of Industrial Production
- 3 National Level Policy and Planning Support



KEY MARKET DRIVERS

Major Driver	Description
Substantial Development of Downstream Industries	Fuel oil is widely used as the major fuel for industrial boilers in various industries such as petroleum processing, chemical and steel. From 2017 to 2022, major downstream industries of fuel oil products experienced stable development. The crude oil processing volume, production of chemical products and raw steel production volume remained at a stable growth from 2017 to 2022, representing CAGRs of 5.3%, 3.1% and 3.2%, respectively. The substantial growth of downstream industries is expected to further boost the consumption on fuel oil products.
Recovering of Industrial Production	Cut-down of overcapacity in some industry has regenerated the vigor of the industry. Industrial production has been recovering. Meanwhile, the 'Belt and Road Initiative' strategy by the PRC government is expected to stimulate the trade of goods and service, driving the industrial production in the long term. The recovering of industrial production is expected to further drive the consumption of fuel oil and thus propel the development of fuel oil market.
National Level Policy and Planning Support	Since the fuel oil is the essential production fuel for various manufacturing industries such as chemical industry and metallurgy industry, nationwide strategic policies and plans on manufacturing also have influence on fuel oil. In recent years, the national strategies such as "One Belt, One Road", which integrate and deepen regional cooperation on manufacturing and infrastructure, are estimated to bring growth potentials for China's manufacturing and also to indirectly motivate the further development of China's fuel oil market.

Source: Frost & Sullivan Analysis

Drivers of Guangdong's Fuel Oil Trading Market

Key Market Drivers

- 1 Strong Growth Potential for Downstream Industries
- 2 Continuous Development and Policy Support for the Shipping Industry
- 3 Nationwide Promotion on Contemporary Maritime Silk Road Strategy



KEY MARKET DRIVERS

Major Driver	Description
Strong Growth Potential for Downstream Industries	According to the 13 th Five-Year Plan of Guangdong Province, Guangdong is designed to build as a world-class industrial base for petrochemical industry and four petrochemical bases are planned to built in Huizhou, Maoming, Jieyang and Zhanjiang. As the largest downstream consumption industry of fuel oil, the strong foreseeable growth potential for petrochemical in Guangdong is anticipated to back up the development of fuel oil trading market in Guangdong province.
Continuous Development and Policy Support for the Shipping Industry	According to the latest issued 'Opinions on the Acceleration of the Health Development of Shipping Industry' (《广东省人民政府关于促进海运业健康发展的实施意见》) issued by the Guangdong provincial government, shipping industry is planned to be developed as one of the pillar industries of Guangdong. By 2020, the size of Guangdong's ocean fleet is estimated to reach around 20 million dead weight tonnage. As one of the major downstream consumption sectors of fuel oil, the further development and concrete policy support of Guangdong's shipping industry is also expected to boost the consumption and demand for fuel oil in Guangdong province.
Nationwide Promotion of Contemporary Maritime Silk Road Strategy	As a crucial component of China's 'Belt and Road' strategy, contemporary maritime silk road is regarded as one of the key national strategy in the future developing period of China. Guangdong province is considered as one of the strategic hub of contemporary maritime silk road. Under nationwide promotion of maritime silk road, relevant fuel oil consumption industries in Guangdong province such as shipping, shipbuilding and heavy industry is estimated to get more developing opportunities and thus drive the consumption and demand for fuel oil products.

Source: Frost & Sullivan Analysis

Policies and Regulations of China and Guangdong's Fuel Oil Market

Law/Measures	Enacted/Implemented by	Effective Date
Notice of the State Development Planning Commission on Consummating Measures on Petroleum Prices and Adjusting Prices of Product Petroleum (关于完善石油价格接轨办法及调整成品油价格的通知)	NDRC	2001 Oct
The Notice regulated that the domestic fuel oil price should be regulated by market and consummate with the international market.		
The Automatic Import Licensing Procedures of Refined Oil from State Trading (2004年成品油国营贸易进口自动许可程序)	Ministry of Commerce	2003 Dec
The Notice regulated that the domestic fuel oil price should be regulated by market and consummate with the international market.		
Notice on adjustment of fuel oil consumption tax policy (财政部、税务总局通知调整部分燃料油消费税政策)	Ministry of Finance, The State Administration of Taxation	2010 Jan
The Notice regulated reformation on price and tax of fuel oil and was still in use. The specific measures included exemption from fuel oil consumption tax and enjoyment of the preferential policies.		
Announcement on Issuing Declaration Requirements, Allocation Principles and Relevant Procedures for Permitted Quantities of Imported Refined Oil (Fuel Oil) from Non-State Trading in 2019 (2019年成品油(燃料油)非国营贸易进口允许量申领条件、分配原则及相关程序)	Ministry of Commerce	2018 Nov
The permitted quantities of imported fuel oil from non-state trading in 2019 is 16.2 million tonnes.		
The Twelfth Five-Year Plan for National Economic and Social Development of Huizhou City (惠州市国民经济和社会发展第十二个五年规划纲要)	Huizhou City Development and Reform Commission	2011 Feb
The plan required to accelerate the construction of oil infrastructure which includes construction of Huaying fuel oil blending and distribution center.		

Note. NDRC refers to National Development and Reform Commission

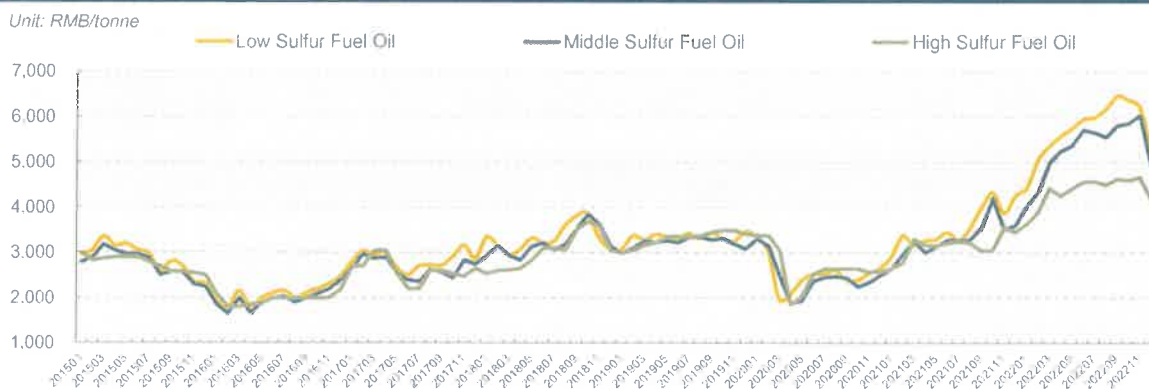
Source: Frost & Sullivan Analysis

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Price Trend of Fuel Oil

Market Price of Fuel Oil (China), January 2015 – December 2022



- As a kind of petroleum product, the price of fuel oil fluctuates with the crude oil price as well. The prices trend of fuel oil under different sulfur content were consistent with the mega trend of crude oil price.
- During 2015 to 2019, the price of fuel oil hovered at between RMB2,000/tonnes to RMB4,000/tonne. While the price slumped below to RMB2,000/tonne in early 2020 due to the oil price slump since March 2020. The price of fuel oil showed a rebound along with the rally of crude oil price increase since May 2020.

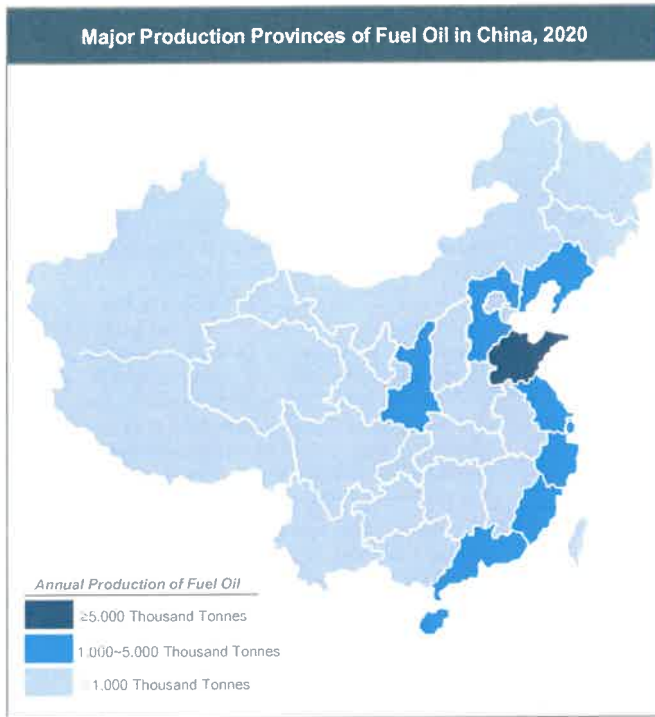
Note: tax is included for the above price of fuel oil

Source: Frost & Sullivan Analysis

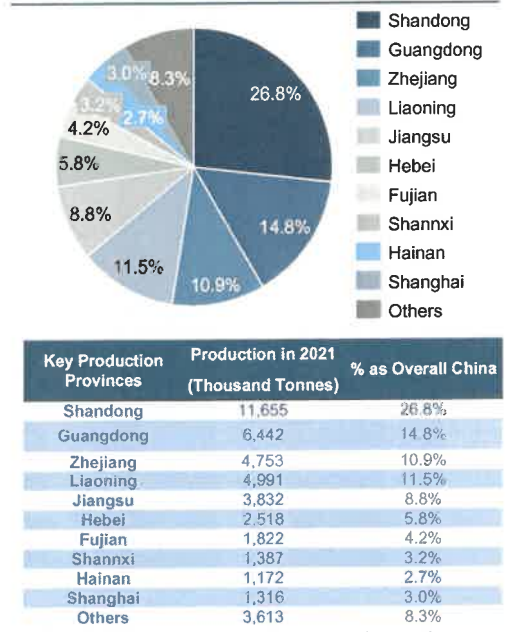
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China Fuel Oil Production Breakdown by Provinces

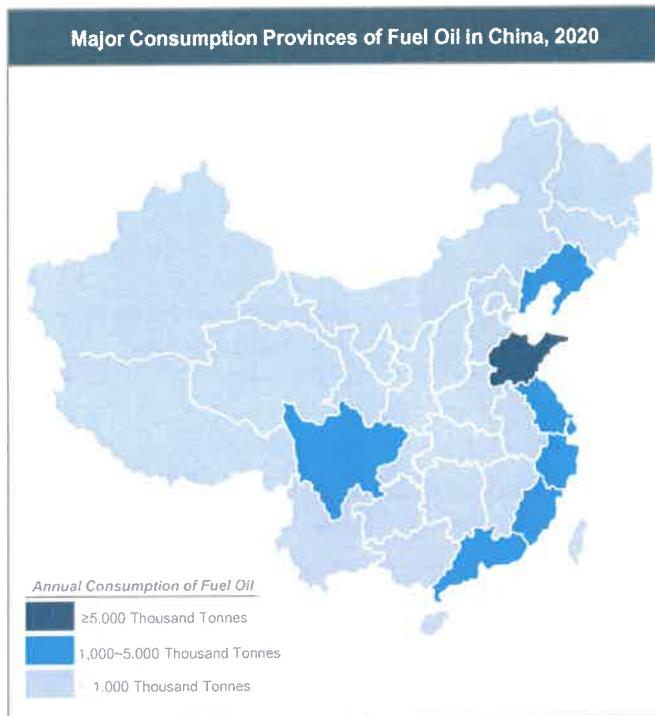


Fuel Oil Production Volume Breakdown by Key Provinces in China, 2021

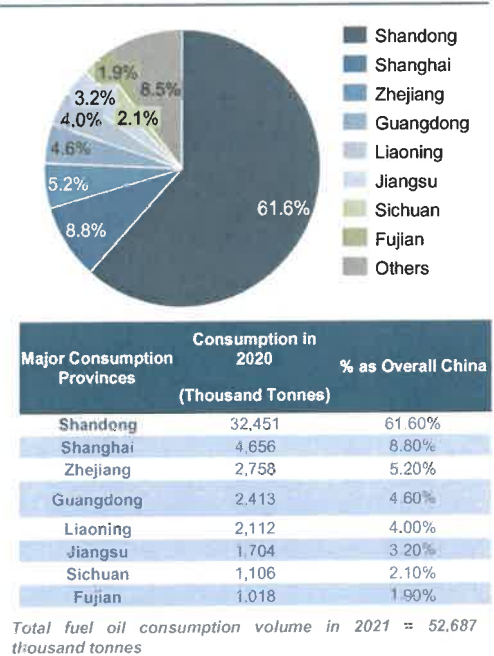


Source: National Bureau of Statistics; Frost & Sullivan Analysis

China Fuel Oil Consumption Breakdown by Provinces



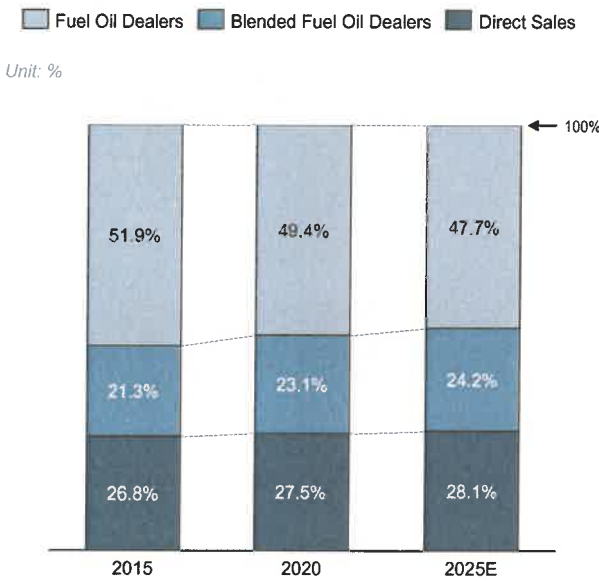
Fuel Oil Consumption Volume Breakdown by Key Provinces in China, 2021



Source: National Bureau of Statistics; Frost & Sullivan Analysis

Distribution and Sales Channel of Fuel Oil in China

Domestic Fuel Oil Production Consumed by Distribution Channels (China), 2015, 2020 2025E



- In China, the domestic production of fuel oil from oil refineries are normally consumed by three distribution channels: fuel oil dealers, blended fuel oil dealers and direct sales.
- Fuel oil dealers are the largest distribution channels for the fuel oil in China and took up around half of the market share in 2020. The share of fuel oil dealers are expected to be further squeezed as those low value-added fuel oil is likely to be further depreciated by downstream customers.
- The share of blended fuel oil dealers has shown an expansion from 2015 to 2020 and the share of this channel is estimated to be further expanded as more and more fuel oil dealers began their transition to be a blended fuel oil dealer in recent years and the demand of such kind of value-added fuel oil is anticipated to be further stimulated under government's supporting on shipping industry and environmental protection.
- The direct sales channel is also expected to be further expanded as industry consolidation in the downstream market of fuel oil like petroleum, shipping, chemical, steel & metallurgy, etc. is likely to generate more large-scale downstream customers of fuel oil.

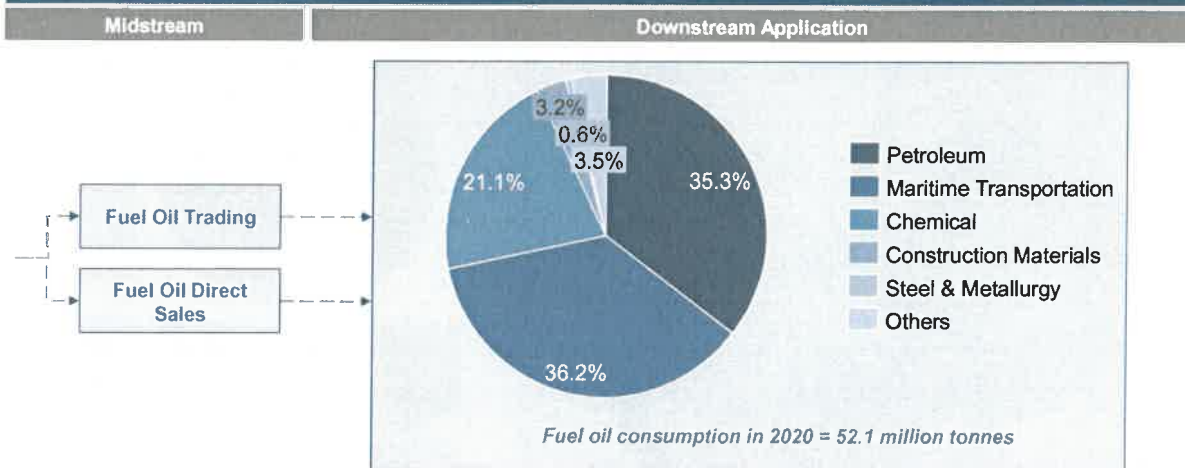
Source: Frost & Sullivan

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Major Downstream Market Development of Fuel Oil

Fuel Oil Downstream Industry Analysis, (China), 2020



- The major downstream consumption of fuel oil concentrated in the petroleum, maritime transportation, chemical, construction material and steel& metallurgy industry. These industries took up over 95% of the fuel oil consumption in 2020.
- Petroleum and maritime transportation are the largest two downstream application segments of fuel oil, accounting over 70% of the fuel oil consumption in 2020.

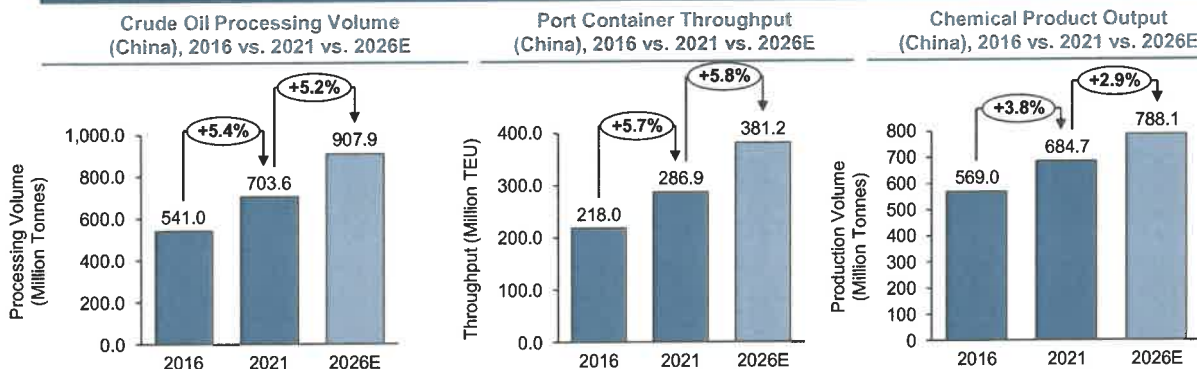
Source: Frost & Sullivan Analysis

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Development of Major Downstream Market

Major Downstream Markets of Fuel Oil (China), 2016 vs. 2021 vs. 2026E



- The major three downstream industries of fuel oil (petroleum refining, water transportation and chemical industry) have experienced stable growth during the period of 2016 to 2021. From 2016 to 2021, the crude oil processing volume grew from 541.0 million tonnes to 703.6 million tonnes, representing a CAGR of 5.4%. China's port container throughput increased from 218.0 million TEU to 286.9 million TEU in 2021. Chemical product output reached 684.7 million tonnes in 2021, representing a CAGR of 3.8% from 2016 to 2021.
- In the foreseeable future, based on China's deepening supply-side structural reform and industrial upgrading trend, these downstream industries like petroleum refining, container shipping and chemical industry in China are estimated to maintain the growth and enter the healthy development track. According to the estimation of Frost & Sullivan, the petroleum refining output volume, port container throughput and chemical industry revenue are likely to increase with CAGRs of 5.2%, 5.8% and 2.9% respectively during 2021 to 2026.

Source: China Petroleum and Chemical Industry Federation, National Bureau of Statistics of China, Ministry of Transportation, Frost & Sullivan

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Future Trends and Threats of China and Guangdong's Fuel Oil Trading Market

Future Trends and Opportunities

Decreasing Dealers with Increasing Market Share

- Small dealers are eliminated in the market for the ease of management. Large dealers expand their network into remote areas. However, the share of sales through dealers is expected to increase in the future. On one hand, the majority of bunker fuel oil are sold through dealers with customized blending process. The stable development of China's shipping industry is driving the growth of sales through dealers. On the other hand, downstream industrial manufacturers are expected to focus on a limited number of large customers who provide quality fuel oil products.

Higher Standard and Better Quality of Fuel Oil Products

- As environmental issues has been raising increasing concern in China, higher standard and better quality fuel oil products are expected to be launched to meet the requirement of relevant policies and regulations. The upgrading consumption of fuel oil products are expected to eliminate small players, who focus on the production of low quality fuel oil products. Large oil dealers are expected to upgrade their production line and adjust their formula of fuel oil products.

Market Consolidation

- Currently, the fuel oil market in Guangdong is operated by a number of private fuel oil traders. In the future period, based on the increasingly strict market regulation for fuel oil products and downstream burning emission supervision, the fuel oil market in Guangdong is expected to usher in product upgrading. High quality fuel oil products with lower burning pollutant emission like low sulfur fuel oil and blended fuel oil is likely to be the mainstream products. Fuel oil traders who obtain those high quality fuel oil resources are estimated to dominated the market and the fuel oil trading market in Guangdong is anticipated to be further consolidated.

Threats

Depressed Shipping Market Under the Combined Impact of COVID-19 pandemic and Global Economic Downturn

- Under the combined impact of COVID-19 pandemic and global economic downturn since early 2020, the global shipping industry was also negatively affected. The BDI (Baltic Dry Index), the benchmark index measures the global demand for shipping capacity, was fell from the highest level in past five years of approximately 2,500 in September 2019 to less than 700 by the end of April 2020. Maritime transportation is one of the major downstream fuel oil consumption industry, the depressed shipping market is likely pose threats and uncertainties to the fuel oil market.

Source: Frost & Sullivan Analysis

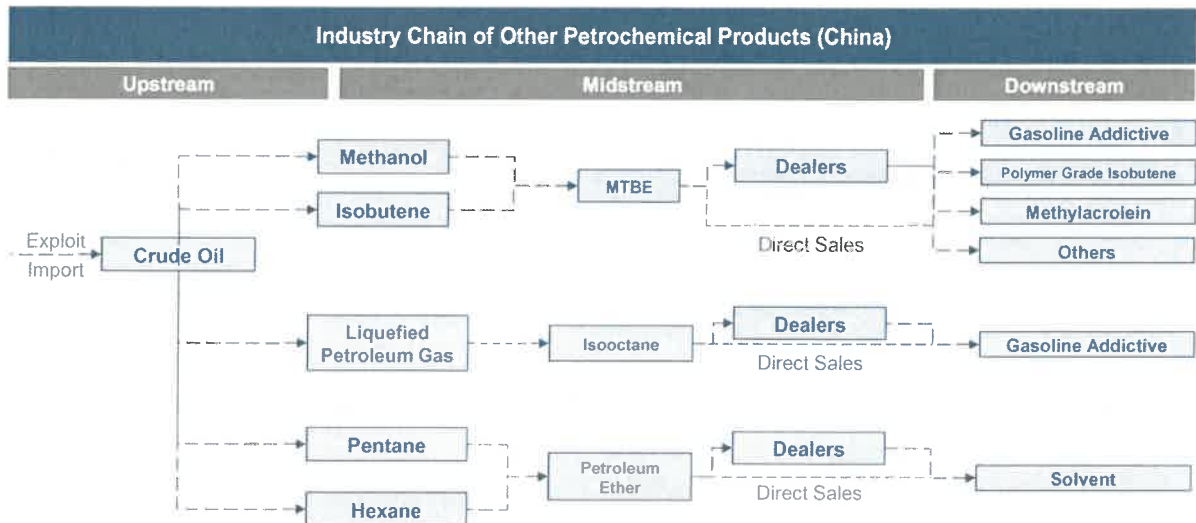
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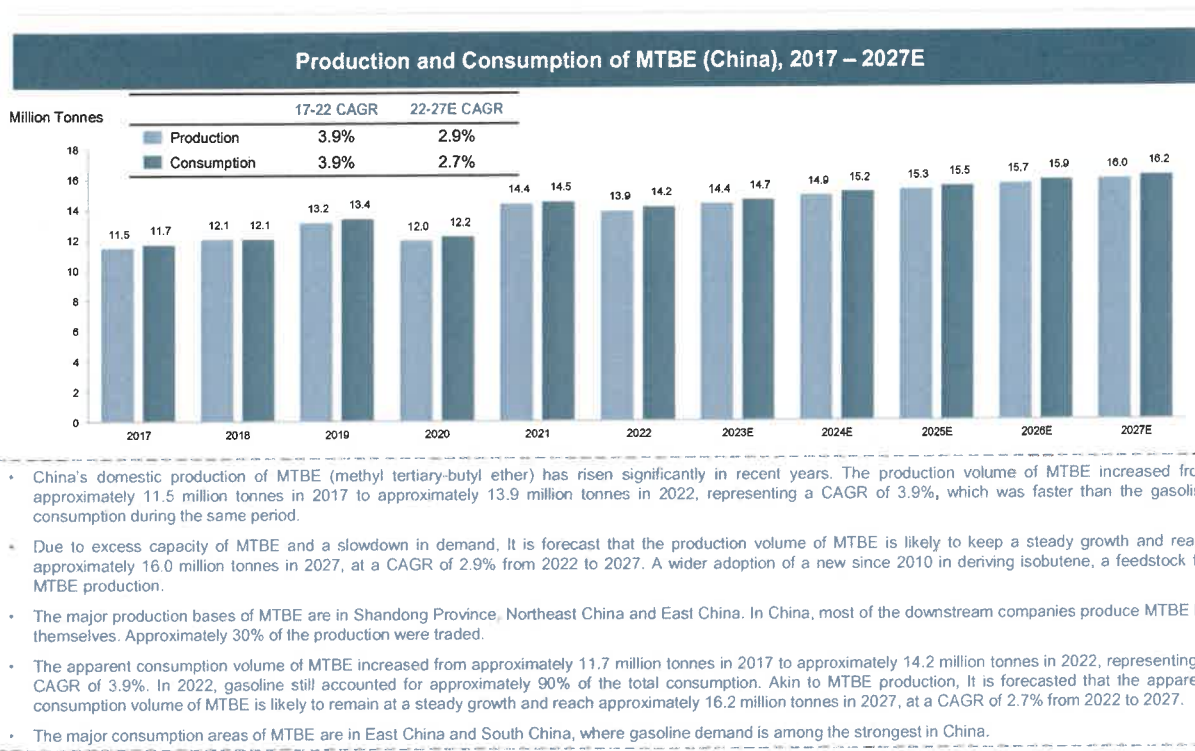
Introduction of Other Petrochemical Products



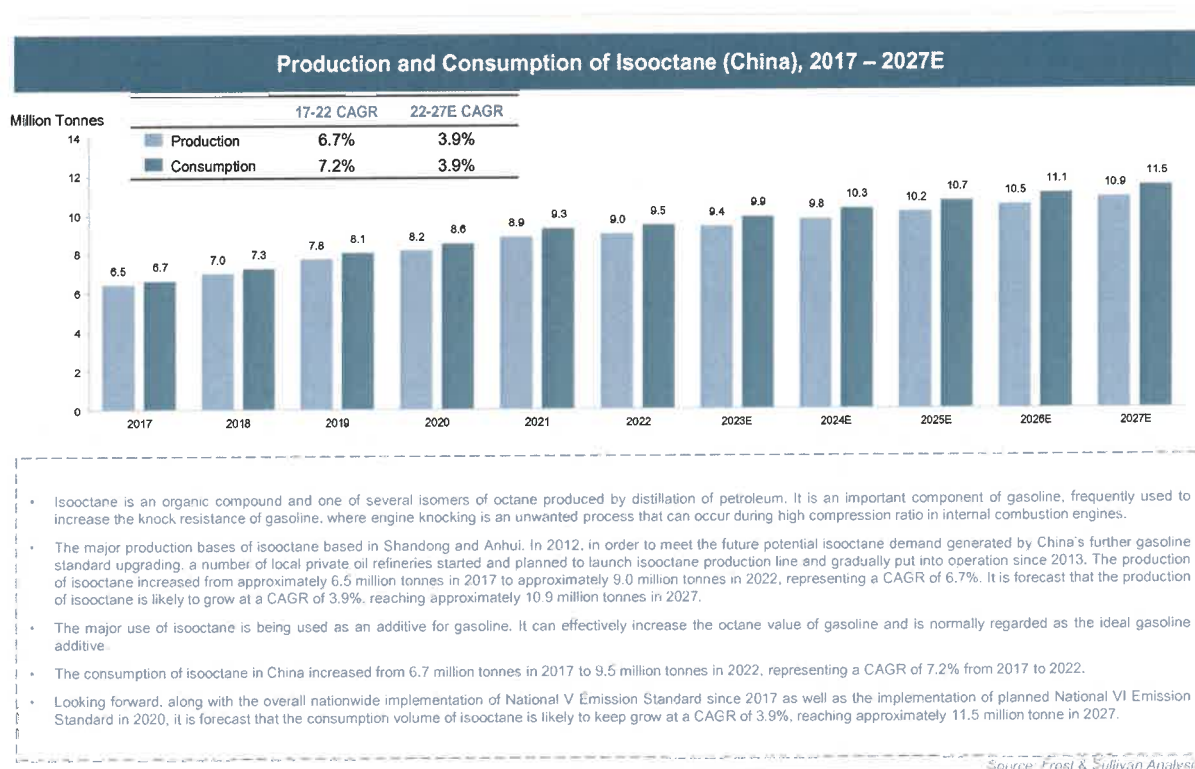
- Petrochemical products are chemical products derived from crude oil. Other petrochemical products refer to petrochemical products other than refined oil and fuel oil, and mainly include organic chemical materials (approximately 200 types) and synthetic materials (i.e. plastics, synthetic fibers, synthetic rubber, etc.).
- MTBE (Methyl tert-butyl ether) is an organic compound with a structural formula $(CH_3)_3COCH_3$. MTBE is manufactured via the chemical reaction of methanol and isobutylene, and is mostly used as a fuel component in fuel for gasoline engines, as well as diesel and chemical industries
- Petroleum ether is the mixture of pentane and hexane. It is usually used as a solvent.
- Isooctane is an important component of gasoline produced from liquefied petroleum gas.

Source: Frost & Sullivan Analysis

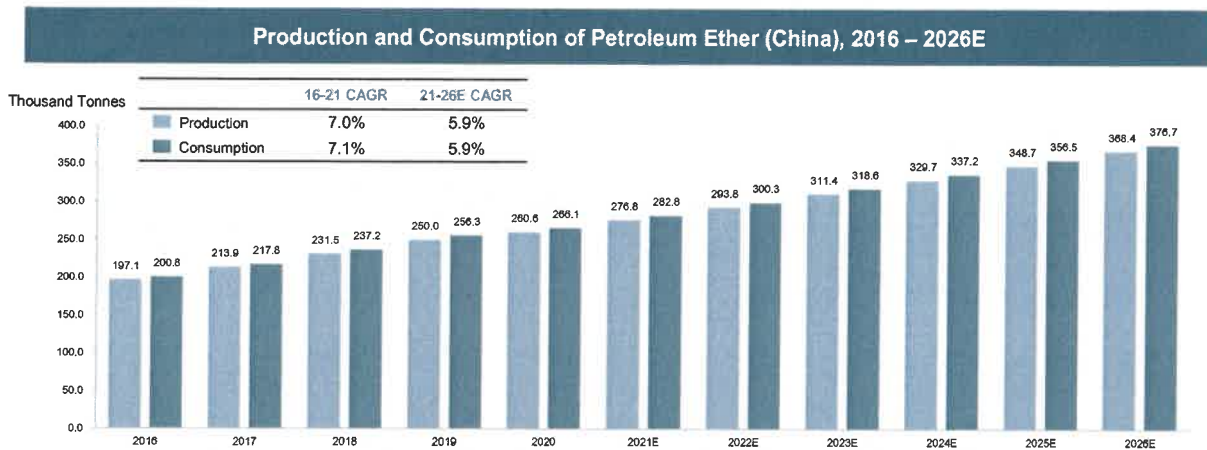
Production and Consumption of MTBE in China



Production and Consumption of Isooctane in China



Production and Consumption of Petroleum Ether in China



- Petroleum ether is a mixture of short chain alkanes consisting mostly of pentanes and hexanes. It is generally used as a solvent in place of hexanes or pentane as it is usually cheaper than either of those solvents because it's a mixture that hasn't been purified.
- The production of petroleum ether in China increased from 197.1 million tonnes in 2016 to 276.8 million tonnes in 2021, representing a CAGR of approximately 7.0%. The production is expected to grow at a CAGR of approximately 5.9% from 2021 to 2026, reaching 368.4 million tonnes in 2026.
- The consumption increased at a similar trend with production, reaching 282.8 million tonnes in 2021 and is expected to reach 376.7 million tonnes in 2026.

Source: Frost & Sullivan Analysis

Drivers, Opportunities and Threats of MTBE, Isooctane and Petroleum Ether in China

Drivers and Opportunities:

- Owing to a booming automobile industry, China's gasoline demand is expected to keep growing in the coming years. Its appetite for premium gasoline is getting stronger amid a growing population of private cars. As an essential blendstock to increase the octane-number of gasoline, MTBE and isooctane demand has been increasing accordingly.
- As major downstream industries, pharmaceutical industry and paints & coatings industry shows growing demand in recent years, which drives the petroleum ether market. Rise in demand for solvents in the agrochemicals sector is also fuelling the petroleum ether market in China.

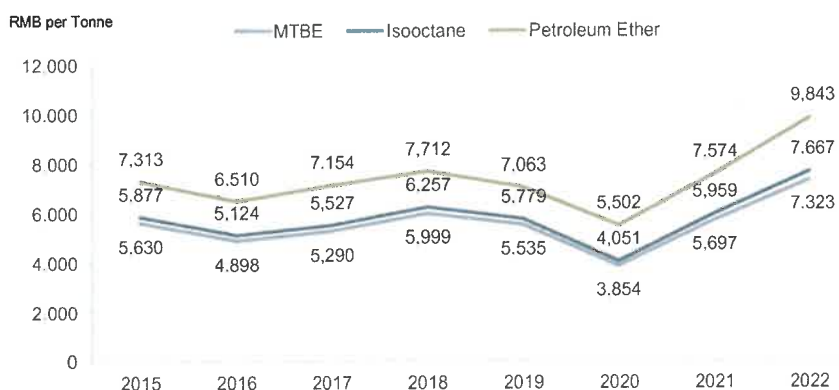
Threats:

- MTBE and isooctane are the two mainstream gasoline additives used for increase the octane value of gasoline. Compared with MTBE, isooctane is more environmentally-friendly with lower emission impact to the natural environment. Some of the developed countries such as the U.S. have banned usage of MTBE in gasoline. It is trend for isooctane to replace MTBE as a gasoline additive. Since 2013, National V Emission Standard of vehicle was implemented, which correspondingly resulted the gasoline standard upgrading to meet the National V Emission Standard. The increasing environmental awareness and stricter limitation in China may impact the market of MTBE.
- High concentration petroleum ether is harmful. It may cause dizziness and drowsiness if inhaled, and may result in central nervous system depression, and loss of consciousness. Hence, petroleum ether may be substituted by other harmless solvents

Source: Frost & Sullivan Analysis

Price Trend of MTBE, Isooctane and Petroleum Ether

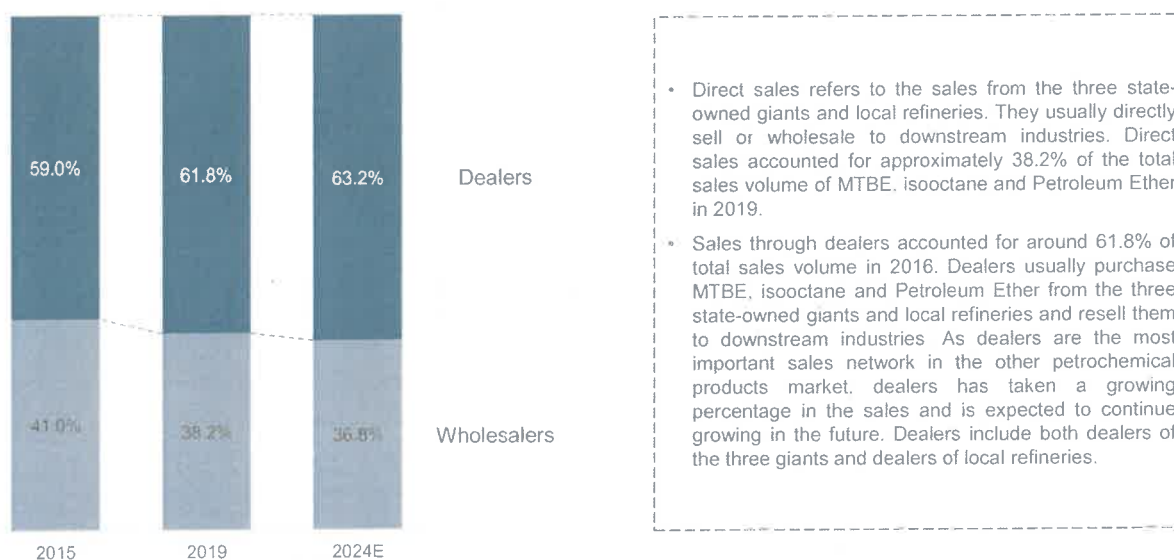
Market Price of MTBE, Isooctane and Petroleum Ether (China), 2015 – 2022



Source: Frost & Sullivan Analysis

Distribution Channel of MTBE, Isooctane and Petroleum Ether

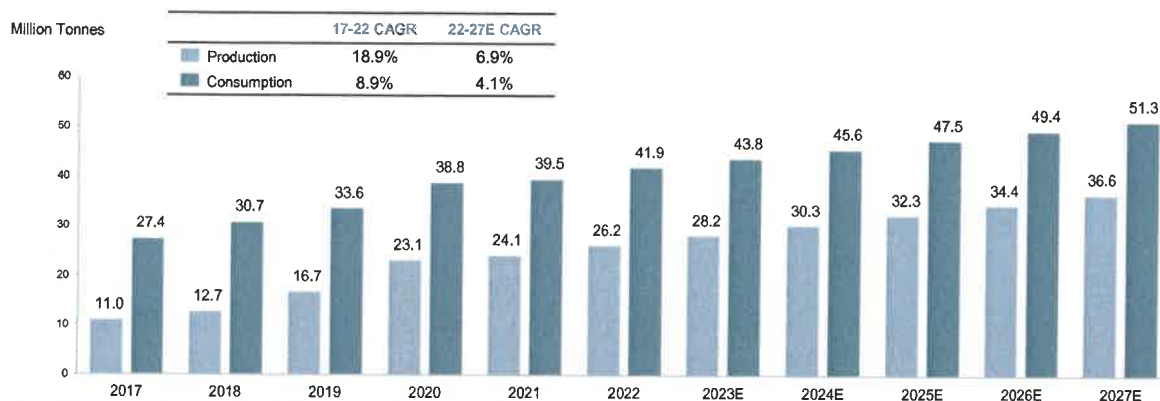
Sales Breakdown of MTBE, Isooctane and Petroleum Ether (China), 2015, 2019, 2024E



Source: Frost & Sullivan Analysis

Introduction of Xylene in China

Production and Consumption of Xylene (China), 2017 – 2027E



- Xylene is a colorless liquid with a strong, sweet odour. There are three forms of xylene in which the methyl groups vary on the benzene ring: meta-xylene, ortho-xylene, and para-xylene. Xylene is commonly used as a solvent in printing, rubber and leather industries, it can also be used to sterilize some materials.
- The total consumption of Xylene in China has increased from 27.4 million tonnes in 2017 to 41.9 million tonnes in 2022 with a CAGR of 8.9%. The rising demand for Xylene in the production of plasticizers and other downstream products has been a major driver of growth in the Xylene market. Additionally, the Chinese government's focus on the development of petrochemical production capacity has created a favorable environment for the growth of Xylene production in the country. Meanwhile, China's domestic production of Xylene has increased from 11.0 million tonnes in 2017 to 26.2 million tonnes in 2022, representing a CAGR of 18.9%. The growth can be attributed to many factors, including increasing downstream demands as well as domestic manufacturers' capacity expansion effort during the period.
- Looking forward, the total production of Xylene is expected to reach 36.6 million tonnes in 2027, representing a CAGR of 6.9%. During the same period, the total consumption of Xylene is expected to grow with a CAGR of 4.1% and reach 51.3 million in 2027.

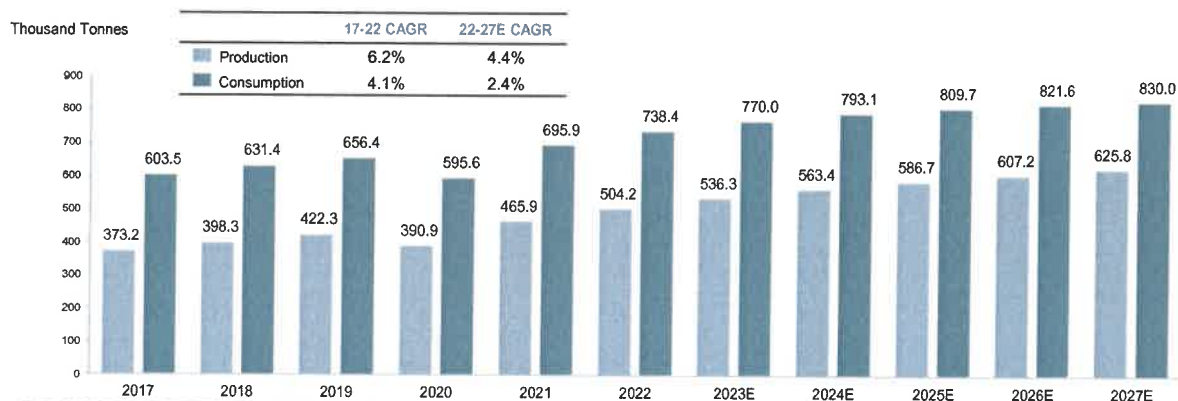
Source: Frost & Sullivan Analysis

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Introduction of Industrial Hexane in China

Production and Consumption of Industrial Hexane (China), 2017 – 2027E



- Hexane is a colorless, volatile liquid hydrocarbon with the chemical formula C₆H₁₄. By type, it can be classified into n-hexane, Isohexane and Neohexane, and by application, it can be categorized into industrial solvents, edible oil extractant, cleansing and degreasing and other applications. Industrial hexane is a type of hexane that is commonly used as raw materials for adhesives, coatings, inks, chemical synthesis processes, and solvents for various extraction processes including vegetable oils.
- The total consumption of industrial hexane in China has increased from 603.5 thousand tonnes in 2017 to 738.4 thousand tonnes in 2022 with a CAGR of 4.1%. The growth was mainly attributed to the increasing demand from downstream industries as industrial hexane is a vital component to produce many products, such as rubber, adhesives and roofing. Moreover, China's domestic production of industrial hexane has increased from 373.2 thousand tonnes in 2017 to 504.2 thousand tonnes in 2022, representing a CAGR of 6.2%.
- Looking forward, with the continuing increasing downstream demand, the total production of industrial hexane is expected to reach 625.8 thousand tonnes in 2027, representing a CAGR of 4.4%. During the same period, the total consumption of industrial hexane is expected to grow with a CAGR of 2.4% and reach 830.0 thousand tonnes in 2027.

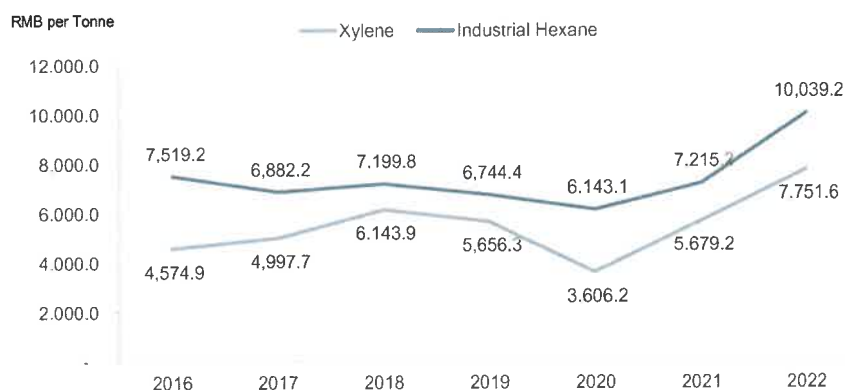
Source: Frost & Sullivan Analysis

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Price Trend of Xylene and Industrial Hexane

Market Price of Xylene and Industrial Hexane (China), 2016 – 2022



Source: Frost & Sullivan Analysis

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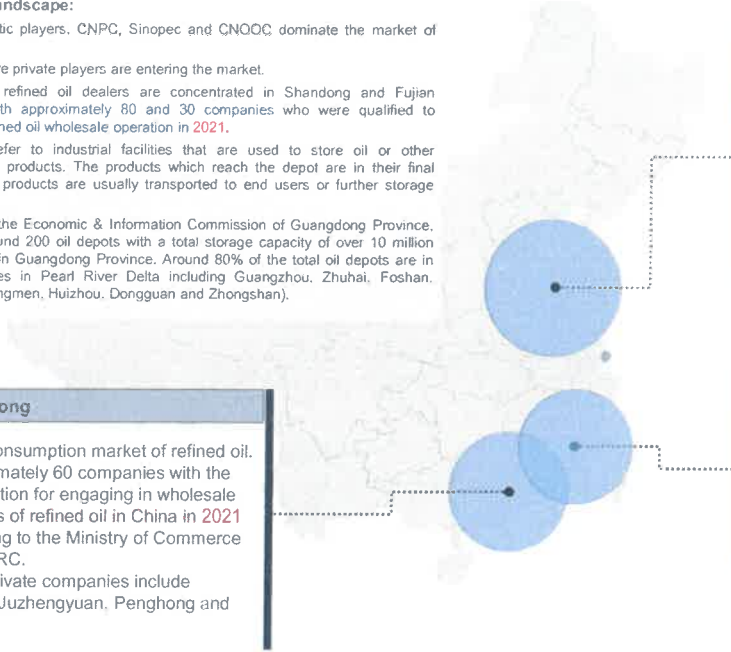
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Competitive Landscape Overview

Competitive Landscape Overview (China and Guangdong)

Competitive Landscape:

- Three domestic players, CNPC, Sinopec and CNOOC dominate the market of refined oil.
- More and more private players are entering the market.
- Most of the refined oil dealers are concentrated in Shandong and Fujian Provinces, with approximately 80 and 30 companies who were qualified to engage in refined oil wholesale operation in 2021.
- Oil depots refer to industrial facilities that are used to store oil or other petrochemical products. The products which reach the depot are in their final form and the products are usually transported to end users or further storage facilities.
- According to the Economic & Information Commission of Guangdong Province, there are around 200 oil depots with a total storage capacity of over 10 million cubic meters in Guangdong Province. Around 80% of the total oil depots are in the eight cities in Pearl River Delta including Guangzhou, Zhuhai, Foshan, Zhaoqing, Jiangmen, Huizhou, Dongguan and Zhongshan).



Shandong

- The largest number of local refineries
- Approximately 80 companies with the qualification for engaging in wholesale business of refined oil in China
- Major private companies include Rizhao East China Petroleum Chemical Co., Ltd., Shandong Wantong Group and so on.

Guangdong

- Major consumption market of refined oil.
- Approximately 60 companies with the qualification for engaging in wholesale business of refined oil in China in 2021 according to the Ministry of Commerce of the PRC.
- Major private companies include Shiyou, Juzhengyuan, Penghong and so on.

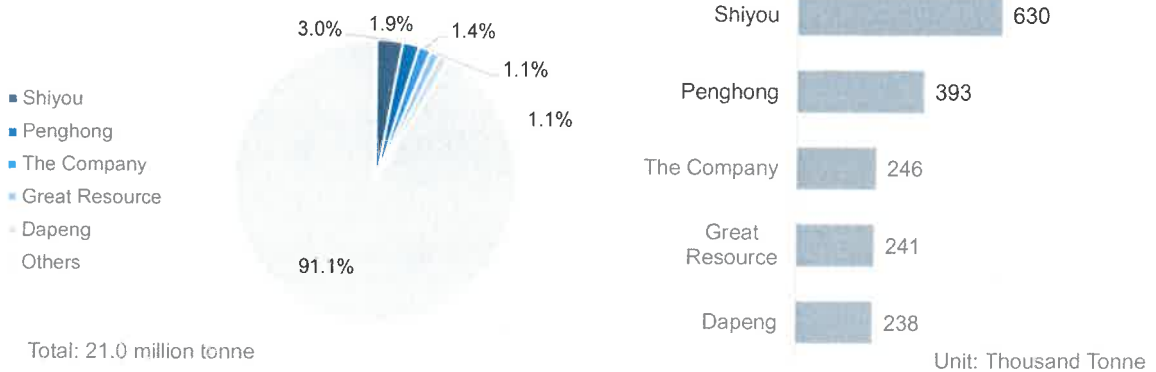
Fujian

- Around 30 companies with the qualification for engaging in wholesale business of refined oil in China
- Half of the dealers belong to the three giant domestic refined oil manufacturers.

Source: Frost & Sullivan Analysis

Competitive Landscape of Guangdong's Refined Oil Trading Market

Top 5 Private Companies of Refined Oil Trading Market (Guangdong), 2021



Note:
 Shiyou is a private company established in 1998 in Zhuhai. Company A is mainly engaged in refined oil and fuel oil dealing
 Penghong is a private company established in 2006 in Heshan. Company B is mainly engaged in refined oil business
 Great Resource is a NEEQ listed company established in 1999 in Shenzhen. Company C is mainly engaged in refined oil and oil products dealing
 Dapeng is a private company established in 1996 in Zhanjiang. Company D is mainly engaged in refined oil dealing and logistics business

Over 400 companies (including branches) have obtained the qualification for engaging in wholesale business of refined oil in China by the end of 2021. None of the private enterprises accounts for more than 1% in the overall nation-wide market.

Shiyou, located in Zhuhai, is the largest private refined oil dealer in Guangdong. Penghong was the second largest private refined oil dealer, accounting for 1.9% of the total trading market. The company ranked at the third place with a market share of 1.4% in 2021. Grand Resource, founded in 1999, was at the fourth place. Dapeng, a company located in Zhanjiang, ranked at the fifth place. Together the top 5 private companies of refined oil trading market occupied a market share of 8.3%. Private dealers together accounted for over 30% of the trading market.

Source: Frost & Sullivan Analysis

Entry Barriers of China and Guangdong's Refined Oil Trading Market

	Entry Barriers	Impact Level
Qualification	<ul style="list-style-type: none"> In order to obtain the qualification for engaging in wholesale or retailing business of refined oil in China, an enterprise shall satisfy several conditions set by the Ministry of Commerce of PRC. For a company who applies to be a refined oil wholesaler, it must have secular and stable channels to provide refined oil, have a refined oil depot whose capacity shall be larger than 10,000 steres and must be equipped with facilities to unload refined oil. 	
Capital Support	<ul style="list-style-type: none"> When initiating a new business in the wholesale business market of refined oil, a large amount of initial capital is necessary for purchasing refined oil, transportation fee, setting refined oil depot and operating various service businesses, and this kind of investment is durative rather than one-time. Moreover, the facilities have to meet relevant standards for operation, and they cannot run on minimum cost before the entrant capturing certain market share and achieving certain economies of scale. Thus new entrants are less likely to survive without strong and continual capital support. 	
Stable Supply Chain	<ul style="list-style-type: none"> For enterprises engaging in wholesale business of refined oil, especially the private companies who do not belong to any oil refineries, it is extremely important for them to establish a firm relationship with private refineries (such as local refineries in Shandong) to ensure secular and stable supply of the products. New entrants in the market usually do not have strong bargaining power and is hard to establish such a firm supply chain. 	
Marketing Capability	<ul style="list-style-type: none"> Generally, customer loyalty is quite high in this industry of refined oil. Relationships are well established between clients and trusted refined oil providers. This may prove to be a strong barrier to new entrants. A new entrant will obviously need access to the clients and will need to invest extra in order to attract those who have established relations with the existing competitors. 	

Highest Lowest

Source: Frost & Sullivan Analysis

Key Success Factors of China and Guangdong's Refined Oil Trading Market

Key Success Factors of China and Guangdong's Refined Oil Market

Wholesalers belongs to the three giant oil refining manufacturers sell their products to their own gas stations and industrial clients. However, private wholesalers generally do not have their own gas stations. Hence, they are either purchasing for the state-operated wholesalers or providing products for private gas stations. Private wholesalers who have established good relationships with downstream clients are able to gain larger market share in the market.

4 Good Relationship with Clients

The whole process of refined oil trading includes purchasing refined oil products, transportation, unloading and storage. Companies with deep industry know-how are familiar with the whole process. Thus, it is easier for them to offer better services with greater efficiency. Also, companies with extensive experience in the industry might be able to grab chances to develop new clients or even to extend their own industry chain to the downstream market.

3 Deep Industry Know-how

1 Secular and Stable Supply Chain

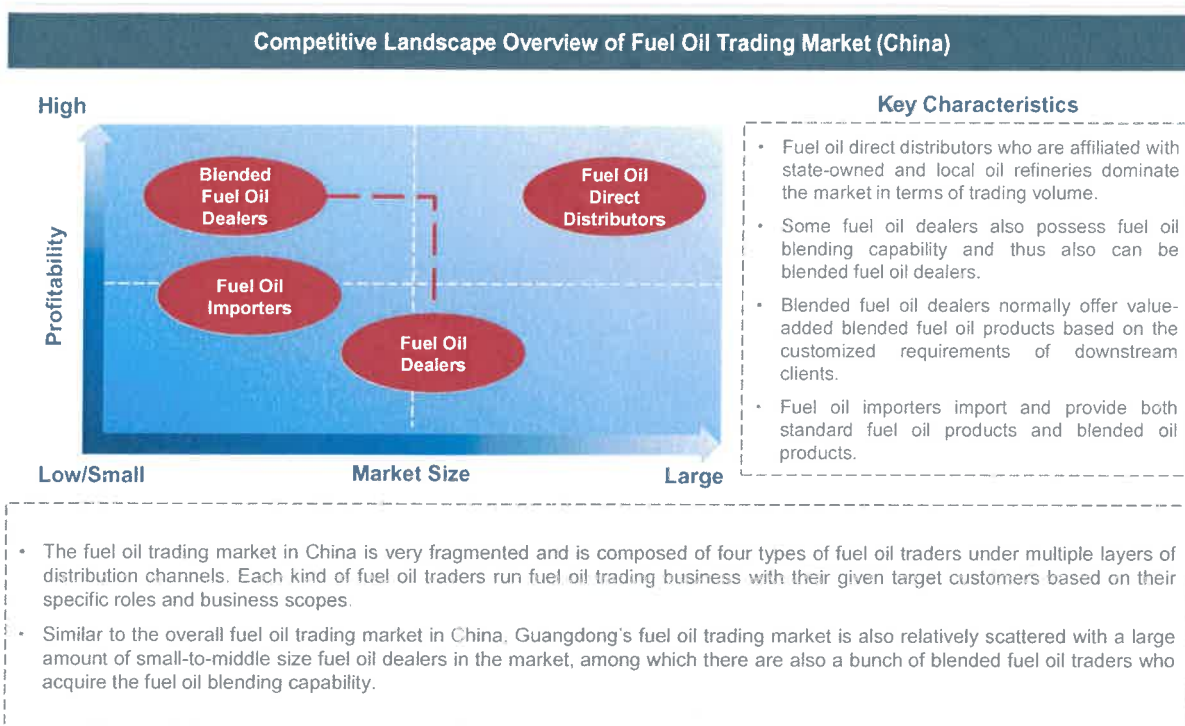
Secular and stable supply chains are essential for the players in the market. With firm relationships with suppliers, the companies are able to reduce the stock while satisfying clients' demand. Also, a company would have stronger bargaining power if stable supply chains with different refineries are established.

Key Success Factors

2 Strong Capital Strength

Refined oil wholesalers need a large amount of capital investment in oil depot. And the companies also need to pay for the refined oil products and transportation in advance before they get paid by their clients. Accordingly, the participants who have strong capital strength to support the daily and successive operation of the products and facilities would be easier to succeed in the market of refined oil trading.

Competitive Landscape Overview China and Guangdong's Fuel Oil Trading Market



Note: The chart is a relative illustration of the major kinds of traders in the fuel oil trading market.

Source: Frost & Sullivan Analysis

Competitive Landscape of Blended Fuel Oil Trading Market in Guangdong Province

Ranking	Blended Fuel Oil Trader	Estimated Blended Fuel Oil Production Volume In 2021 (Thousand Tonnes)	Estimated Market Share
1	Zhuhai Youfeng (Company E)	227.1	7.8%
2	Guangzhou Zhongyuan (Company F)	208.1	7.1%
3	Maoming Tianyuan (Company G)	165.1	5.7%
4	Dongguan Tianhui (Company H)	141.3	4.8%
5	Shenzhen IMT (Company I)	108.1	3.7%
	Top 5	849.7	29.1%
	JTF (PRC)	27.2	0.9%
	Others	2,044.5	70.0%
	Total	2,921.4	100.0%

Note:

Company E is a private company established in 2001 with principal business located in Guangdong Province. Company E is mainly engaged in refined oil, fuel oil and chemical products dealing.

Company F is a private company established in 2003 with principal business located in Guangdong Province. Company F is mainly engaged in chemical products, fuel oil and refined oil dealing.

Company G is a private company established in 1996 with principal business located in Guangdong Province. Company G is mainly engaged in fuel oil and chemical products dealing.

Company H is a private company established in 2005 with principal business located in Guangdong Province. Company H is mainly engaged in fuel oil and lubricant dealing.

Company I is a private company established in 2004 with principal business located in Guangdong Province. Company I is mainly engaged in fuel oil and chemical products dealing.

- Among the fuel oil dealers in the PRC, there are approximately over 200 fuel oil dealers with fuel oil blending capability. The blended fuel oil market in the PRC is relatively fragmented as at 2021; the top five players accounted for approximately 29% market share in terms of production volume while JTF (PRC) accounted for approximately 0.4% of the market share in the PRC market.
- The blended fuel oil trading market in Guangdong is relatively concentrated with top 5 market players accounted for approximately 29% of the entire market in 2020. This concentrated market structure is mainly due to the high entry barrier of fuel oil blending capability that new comers need to face in acquiring such kind of customized fuel oil blending capability to meet the requirements of downstream clients. Currently, there are over 30 fuel oil blenders in Guangdong Province.
- By 2020, JTF (PRC) accounted for approximately 0.6% of the market share in Guangdong's blended fuel oil trading market in terms of production volume

Source: Frost & Sullivan

Entry Barriers to China and Guangdong's Fuel Oil Trading Market

Entry Barriers

<p>Capital Investment</p>	<ul style="list-style-type: none"> As a kind of bulk commodity, the capital investment on fuel oil wholesale is relatively huge. In addition, most of the oil refineries in China set strict payment terms for their wholesalers and require advance full payment of the commodity. Thus, the fuel oil trading market set up relatively high capital barrier for those new entrants.
<p>Stable Purchase Channels</p>	<ul style="list-style-type: none"> Most fuel oil products from fuel oil traders are normally purchased from upstream oil refineries. Oil refineries also prefer to select those stable and capital-abundant wholesalers who have already established long-term purchase cooperation with them. It is relatively difficult for those new entrants in fuel oil trading market to find stable purchase channels in a short period of time, which is likely to be a barrier to them.
<p>Oil Blending Capability</p>	<ul style="list-style-type: none"> For those blended fuel oil traders who provide oil blending service for downstream customers like shipping companies and maritime refueling station operators. Strong oil blending capability is vital for the quality of blended fuel oil products and require experienced oil blending knowledge. For those new entrants in fuel oil trading market, it is hard for them to allocate all the resources to establish well-operated oil blending production lines shortly.
<p>Logistics & Warehousing</p>	<ul style="list-style-type: none"> Warehouses, wharfs and transportation facilities are those essential hardware for the daily operation of fuel oil traders. Those hardware can effectively reduce the operation cost of and ensure business sustainability. Well-established logistics system can guarantee the oil purchase and products delivery and warehouse can be used for oil and raw material storage and evade market price fluctuation to some extent. Those hardware facilities and systems is not easy for new entrants to obtain within a short time.

Source: Frost & Sullivan Analysis

Key Success Factors of China and Guangdong's Fuel Oil Trading Market

- Fuel oil is potentially dangerous with high sensitivity of explosion. During the transportation and storage, operators should strictly keep fuel oil away from fire and static electricity to prevent risk of explosion. Besides, the temperature of fuel oil in tanks should be carefully controlled. Therefore, maintaining prudent safety precautions is very essential and deemed as a key successful factor for participants in the fuel oil trading business.

- Fuel oil trading includes various segments ranging from oil wholesale, oil blending, storage and terminal sales, which requires strong capital investment in both initial and operation stages. Dealers need initial capital to purchase fuel oil resource from the upstream providers and construct fuel oil distribution network for sales. After the initial capital outlay, operating expense also needs strong financial support. Hence, strong capital investment is the foundation for the successful operation of fuel oil business.

1 Prudent Safety Precautions

2 Strong Capital Investment

3 Specialized Operation Team

4 Customized Blending Capability

Key Success Factors

- Fuel oil trading business covers a wide variety of operation affairs such as fuel oil wholesales, fuel oil blending, storage, oil transportation, downstream customer maintenance, etc. In particular, for those blended fuel oil traders, specialized and experienced oil blending technicians are the crucial part for the success of their blending fuel oil business. Hence, specialized operation team is essential for fuel oil trading to ensure the smooth running of the business.

- Blended fuel oil is normally regarded as a kind of value-added fuel oil. Therefore, customized blending capability can be regarded as another key successful factor for fuel oil trading market. Rich industry experience in fuel oil customized blending enables the company to select optimal combination of fuel oil products to blend the customized fuel oil products which meets exactly the customer's need and gives the company a competitive edge for fuel oil trading.

Source: Frost & Sullivan

Content

1	China's Macro Economy and Oil Market Overview
2	China's Crude Oil Market Analysis
3	China and Guangdong's Refined Oil Trading Market Analysis
4	China and Guangdong's Fuel Oil Trading Market Analysis
5	China and Guangdong's Other Petrochemical Products Trading Market Analysis
6	Competitive Landscape Analysis
7	Appendix

Abbreviations and Terms

Prospectus Code	Chinese Name	English Abbreviation	English Name
Company A	珠海实友化工有限公司	Shiyou	Zhuhai Shiyou Chemical Co., Ltd.
Company B	深圳巨正源股份有限公司	Grand Resource	Shenzhen Grand Resource Co., Ltd.
Company C	鹤山市鹏鸿能源贸易有限公司	Penghong	Heshan Penghong Energy Co., Ltd.
Company D	湛江大鵬石化有限公司	Dapeng	Zhanjiang Dapeng Petrochemical Co., Ltd.
Company E	珠海市佑丰企业有限公司	Zhuhai Youfeng	Zhuhai Youfeng Enterprise Co., Ltd.
Company F	广州市中源石油化工有限公司	Guangzhou Zhongyuan	Guangzhou Zhongyuan Petrochemical Co., Ltd.
Company G	茂名市天源商贸发展有限公司	Maoming Tianyuan	Maoming Tianyuan Business Trading Development Co., Ltd.
Company H	东莞市天辉能源实业投资有限公司	Dongguan Tianhui	Dongguan Tianhui Energy Investment Co., Ltd.
Company I	深圳市粤美特石油化工有限公司	Shenzhen IMT	Shenzhen IMT Petrochemical Co., Ltd.

Abbreviations and Terms

Abbreviations and Terms

- **CAGR:** compound annual growth rate
- **China:** if not specified refers to mainland China, excluding Hong Kong, Taiwan and Macau
- **GDP:** gross domestic product
- **R&D:** research & development
- **RMB:** Renminbi, the lawful currency of the PRC
- **API:** the American Petroleum Institute
- **SAE:** the Society of Automotive Engineers
- **Barrel:** One cubic meter equals 6.2898 barrels

Limitations in Source of Information

- Interviews with end-users, vendors and distributors are conducted to collect information for this report, based on a best-efforts basis.
- Frost & Sullivan will not be responsible for any information gaps where interviewees have refused to divulge confidential data or figures.
- In instances where information is not available, figures based on similar indicators combined with Frost & Sullivan in-house analysis will be deployed to arrive at an estimate.
- Frost & Sullivan will state the information sources at the bottom right-hand corner of each slide for easy reference.

Note to Numeric Calculations

- Value and percentage figures in this report are all rounded. Figures may not add up to the respective totals owing to rounding.
- The base year is 2022. The historic period is from 2017 to 2021. The forecast period is from 2023 to 2027.

Source: Frost & Sullivan Analysis

Methodologies

- Frost & Sullivan is an independent global consulting firm, which was founded in 1961 in New York. It offers industry research and market strategies and provides growth consulting and corporate training. Its industry coverage in China includes automotive and transportation, chemicals, materials and food, commercial aviation, consumer products, energy and power systems, environment and building technologies, healthcare, industrial automation and electronics, industrial and machinery, and technology, media and telecom.
- The Frost & Sullivan's report includes information on China's macro economy analysis, China's crude oil market overview, China and Guangdong's refined oil market analysis, China and Guangdong's refined oil market competitive landscape analysis, China and Guangdong's fuel oil market analysis, China and Guangdong's other petrochemical products trading market analysis.
- The Frost & Sullivan Report includes both historical and forecast information relating to the refined oil and fuel oil industries in the PRC and other relevant economic data. Frost & Sullivan has relied on a variety of industry sources in determining its market data, including but not limited to, industry databases, interviews with market participants, publicly available statistics, publicly released corporate information and the expertise of Frost & Sullivan industry analysts
- All statistics are based on information available as of the date of the Frost & Sullivan Report. Other sources of information, including government, trade associations or marketplace participants, may have provided some of the information on which the analysis or data is based. Frost & Sullivan considered the source of information as reliable because (i) it is general market practice to adopt official data and announcements from various PRC government agencies, and (ii) the information obtained from interviews is for reference only and the findings in the Frost & Sullivan Report are not directly based on the results of these interviews. Frost & Sullivan has proven track records in providing market research studies to government departments/agencies and private clients in the regions where the Frost & Sullivan Report covers.
- Projected total market size was obtained from historical data analysis plotted against macroeconomic data as well as specific related industry drivers.
- Frost & Sullivan's report was compiled based on the below assumptions:
 - China's economy is likely to maintain steady growth in the next decade;
 - China's social, economic, and political environment is likely to remain stable in the forecast period;
 - Market drivers like growth of possession of passenger vehicles, recovering of industrial production, and stricter environmental regulations are expected to drive the growth of China's refined oil and fuel oil market.
- All the data and information regarding the Company is provided by the Company.

Source: Frost & Sullivan Analysis

Thank You!

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