
# CRUDE OIL FUTURES Q&A

2025 Edition

# CONTENTS

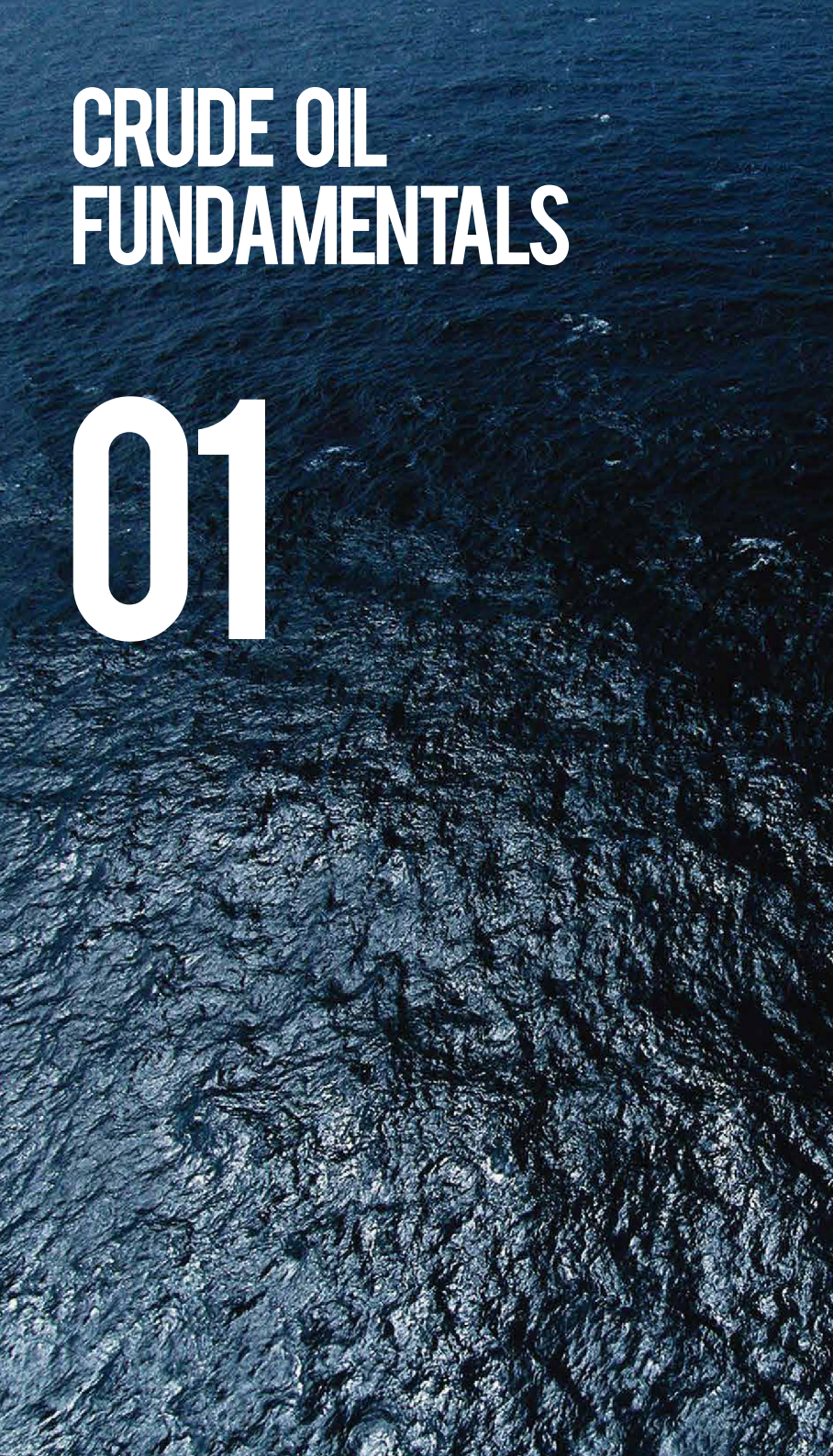
## SETTLEMENT AND RISK MANAGEMENT OF CHINA'S CRUDE OIL FUTURES TRADING

## CRUDE OIL FUTURES DELIVERY

# APPENDIX

# CRUDE OIL FUNDAMENTALS

# 01



# CRUDE OIL FUNDAMENTALS

## 01 What are the different types of crude oil?

Crude oil can be classified by several different criteria:

- By chemical composition: Paraffinic, naphthenic, and intermediate;
- By sulfur content: Ultra-low-sulfur, low-sulfur ("sweet"), medium-sulfur, and high-sulfur (the latter two are often known as "sour");
- By relative density (or API gravity): Light, medium, and heavy.

## 02 What do "paraffinic", "naphthenic" and "intermediate" crude oils mean?

Paraffinic, naphthenic and intermediate crude oils are differentiated by the proportion of hydrocarbon molecules they contain. Paraffinic crude contains a higher proportion of alkanes; naphthenic crude features a higher proportion of cycloalkanes and aromatics (also known as "arene"); intermediate crude falls somewhere in-between the two.

# 03 How are light and heavy crudes classified?

Light and heavy crude oils are usually classified in two ways.

They can be classified by relative density, which in China is the ratio of the mass of oil at 20 °C to that of pure water at 4 °C under 1 standard atmospheric pressure. In general, crude oil with a relative density of 0.9-1.0 is classified as heavy crude, and crude oil with a relative density below 0.9 is classified as light crude.

Light and heavy crude oils can also be classified by the American Petroleum Institute (API) gravity, which is calculated as: API gravity = (141.5 / relative density of crude oil at 60 °F) – 131.5, where the relative density of crude oil at 60 °F is the ratio of the crude oil's mass to that of a unit volume of pure water at 60 °F (15.6 °C) under 101,325 Pa of ambient pressure.

By international convention: ultra-light crude has an API gravity ≥ 50, light crude 35-50, medium crude 35-26, and heavy crude 26-10. However, this grading system is not a universal standard, as different countries and companies often take other factors into consideration, such as applicable pricing benchmarks.

## 04 How to differentiate between low-sulfur and high-sulfur crude?

Low-sulfur and high-sulfur crude oil are categorized by sulfur content, which refers to the weight percent of sulfur (either sulfide or elemental sulfur) contained in a crude oil. Sulfur impacts the quality of a crude oil because it causes difficulties in processing the oil, such as corrosion of metals, and air pollution from the burning of high-sulfur fuels. Generally, most crude oils contain a low level of sulfur. Based sulfur content, crude oil can be classified as low-sulfur ("sweet"), medium-sulfur, and high-sulfur crude oils (the latter two are often referred as "sour"), respectively containing less than 0.5%, between 0.5% and 2.0%, and more than 2.0% of sulfur by weight.

## 05 What types of crude oils are those from the North Sea, Middle East, and the Daqing and Shengli Oilfields of China?

Crude oils from the Brent and the Ninian oilfields in the northern Atlantic are light sweet crude oil.

Crude oils from the Middle East are mostly medium sour crude oil, such as Basra light of Iraq, Dubai of the United Arab Emirates, and Qatar Marine of Qatar.

China's Daqing Oilfield produces light sweet crude oil and the Shengli Oilfield produces medium-to-heavy sour crude oil.

# 06 What is crude oil used for?

Crude oil can be processed and refined into a wide array of petroleum products. It has powered the world economy, is used for a variety of purposes, and is the most consumed energy source in the world today.

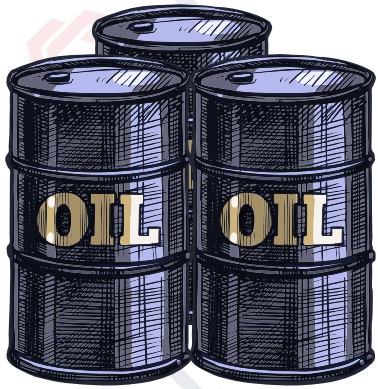
Products refined, produced, or derived from crude oil are: (i) combustible fuels that are used as main energy sources, such as gasoline, kerosene, diesel, fuel oil, and liquefied petroleum gas; (ii) high-molecular-weight polyethylene, a crucial pillar of the modern materials industry, and the vast majority of raw materials for industrial organic chemicals; (iii) a wide range of lubricant and ancillary materials extensively used in metal processing and machineries; and (iv) nitrogen fertilizers and other industrial chemicals used in agriculture. Other than being used as fuel, petroleum products are also widely applicable in the construction and building material industries, light industry and the textile industry. It plays vital roles in future development of novel materials, technique, and product invention.

## 07 What's the relationship between crude oil and gasoline or diesel oil?

Crude oil can be separated easily by fractional distillation, into gasoline, kerosene and diesel fractions, and other distillate products so that they can be further refined. These fuels then can be further blended or mixed with appropriate additives to create the finished products of gasoline and diesel we use every day.

## 08 How is crude oil transported?

Generally, intercontinental transportation of crude oil relies on marine tankers whose deadweight tonnage ranges from tens of thousands to hundreds of thousands of tons, while pipelines are usually used to transport oil on land. Rail and tank trucks are also used for short-distance transportation.

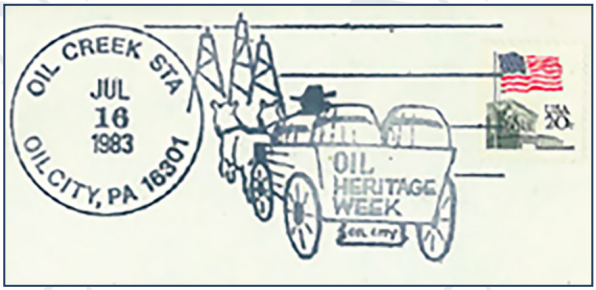


# 09 Why is crude oil measured in barrels? How much is a barrel? What's the relation between barrels and metric tons?

Barrel as a unit of measurement for crude oil originated from the Drake Well in Pennsylvania, U.S. It later became a widely accepted standard for oil trades in the U.S. and around the world through its use by the Standard Oil Company founded by John D. Rockefeller.

1 barrel = 42 U.S. gallons (1 U.S. gallon = 3.7854 liters) ≈ 0.159 m3 = 159 liters

While many oil producing countries, such as OPEC and western countries like UK and U.S., use the volume-based unit of "barrel" to measure crude oil, countries including China and Russia use "metric ton", a weight unit. Since the oil density varies greatly among the different places of origin, the weight of a barrel may fluctuate from 128 kg to 142 kg, meaning 1 metric ton of crude oil is about 7.0 to 7.8 barrels.




Commemorative postmark of Oil City, Pennsylvania dated July 16, 1983 in celebration of the "Oil Heritage Week". The mark depicts a horse cart carrying wooden barrels.

# GLOBAL CRUDE OIL DEMAND & SUPPLY AND TRADE

# 02

# GLOBAL CRUDE OIL DEMAND & SUPPLY AND TRADE

## 10 How much oil does the world produce and consume daily?

According to the Energy Institute's EI Statistical Review of World Energy 2024, total global crude oil consumption in 2023 was 4.531 billion metric tons (100 million bpd), up 2.538 million bpd from the year before. Total global production was 4.508 billion metric tons (96.258 million bpd), up 1.845 million bpd. In particular, in 2023 China consumed 769 million metric tons of oil and produced 209 million metric tons, equaling a daily consumption level of 16.577 million barrels and daily production level of 4.198 million barrels.

According to a monthly report from the Organization of the Petroleum Exporting Countries (OPEC) in 2025, the global daily consumption of crude oil in 2024 rose 1.47% year-on-year to 104 million bpd. The total supply from non-OPEC countries was 75.70 million bpd and that from OPEC countries was 26.70 million bpd.

# 11 How long will the world's oil reserves last?

The calculation of oil reserves expressed in time usually adopts reserves-to-production ratio, a value derived from the amount of remaining proven reserves divided by the amount of oil production in one year at the current rate. EI Statistical Review of World Energy 2024 estimates that the total global proven oil reserves were at 173.24 billion barrels as of the end of 2020, which could last for 53.5 years at the current production level.

However, estimates of how many years remain before the oil supply is exhausted change from year to year as new deposits are found. If new discoveries of the oil reserves outpace the output, then the ratio will further increase. In fact, this ratio has been going up instead of down in recent years.

# 12 What factors will affect the crude oil reserves depletion rate?

There are three main factors that impact depletion of oil reserves: changes in global supply and demand, alternative energy sources, and oil prices.

On the demand side, according to the bp Energy Outlook 2024, by 2050 energy consumption of developed countries is expected to drop to 26% of the world's total and that of emerging economies would remain at 74% under the "Current Trajectory" scenario; and under the "Net Zero" scenario, the figures would be 29% and 71%, respectively.This contrasts sharply with the situation in 1990, when the OECD accounted for two-thirds of global energy consumption and the developing countries only one-third. Indeed, developing economies will remain as major energy consumers in the decades to come.

On the supply side, oil exploration has been moving to open seas, deep waters, and onshore deep drilling. With the coming of the U.S. oil revolution in 2011, producers are setting eyes on the oil and gas resources formerly locked away in shale, which has greatly increased the total recoverable reserves in the U.S.

In addition, natural gas, wind power, and other alternative sources of energy will also affect the demand for oil.

Lastly, the price factor. Brent crude from North Sea was trading for less than $10 a barrel in November 1998. But since we entered the 21st century, the oil price has gone through several sharp price movements. In July 2008, the price climbed to nearly $150, followed by a free-fall to just over $30 in December in that same year. Then in 2012, it rebounded to $129, only to nosedive in 2014 to below $40, partly due to a "high supply, low demand" expectation. High oil prices can curb oil demand to a certain extent and encourage investment in new energy sources. Low oil price, on the other hand, can accelerate the depletion of oil resources.

# 13 What is the global geographical distribution of major oil production and consumption?

As can be seen from the map below, global oil consumption is mainly concentrated in the Asia-Paci c, North America, Europe, and Eurasia. The Middle East, North America, the Commonwealth of Independent States (CIS), and Africa are the main supplying regions.

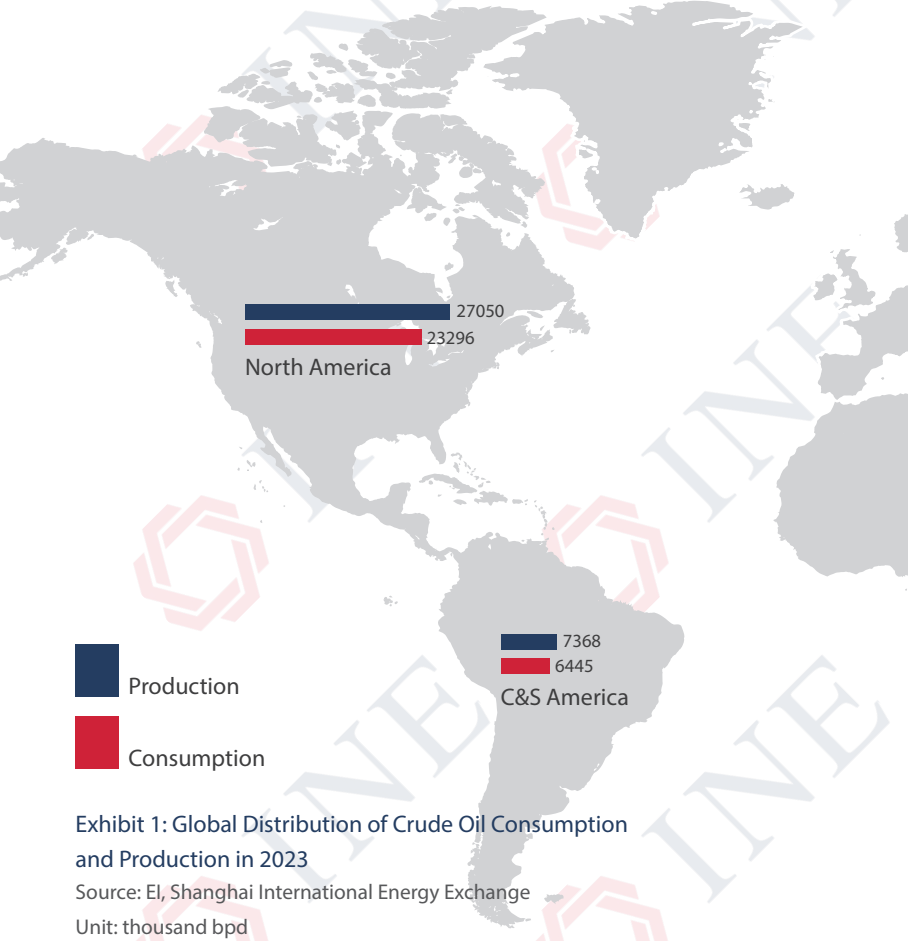



Exhibit 1: Global Distribution of Crude Oil Consumption and Production in 2023

Source: EI, Shanghai International Energy Exchange

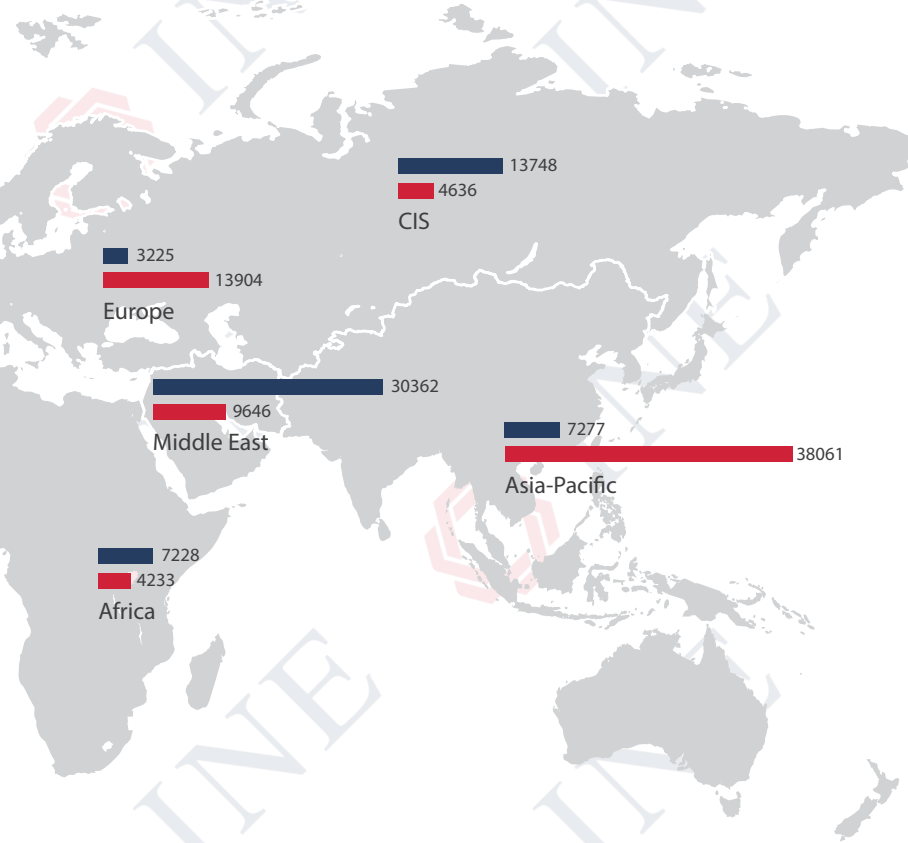
Unit: thousand bpd

Table 1: Global Crude Oil Consumption and Production in 2023

| Region | North America | C&S America | Europe | CIS | Middle East | Africa | Asia-Pacific | Global Total |
|---|---|---|---|---|---|---|---|---|
| Consumption | 23,296 | 6,445 | 13,904 | 4,636 | 9,646 | 4,233 | 38,061 | 100,221 |
| Production | 27,050 | 7,368 | 3,225 | 13,748 | 30,362 | 7,228 | 7,277 | 96,258 |

Source: EI Statistical Review of World Energy 2024

Unit: thousand bpd



# 14 What are the largest oil producing and consuming countries?

According to the EI Statistical Review of World Energy 2024, the largest oil producers are the United States (19.358 million bpd), Saudi Arabia (11.389 million bpd), Russia (11.075 million bpd), Canada (5.653 million bpd), Iran (4.662 million bpd), Iraq (4.355 million bpd), China (4.198 million bpd), United Arab Emirates (3.922 million bpd), Brazil (3.502 million bpd) and Kuwait (2.908 million bpd).

Table 2: Global Crude Oil Production and Consumption in 2023

| Crude Oil Production | | Crude Oil Consumption | |
|---|---|---|---|
| U.S. | 19,358 | U.S. | 18,984 |
| Saudi Arabia | 11,389 | China | 16,577 |
| Russia | 11,075 | India | 5,446 |
| Canada | 5,653 | Saudi Arabia | 4,052 |
| Iran | 4,662 | Russia | 3,635 |
| Iraq | 4,355 | Japan | 3,366 |
| China | 4,198 | South Korea | 2,797 |
| UAE | 3,922 | Brazil | 2,567 |
| Brazil | 3,502 | Canada | 2,351 |
| Kuwait | 2,908 | Germany | 1,955 |

Source: EI Unit: thousand bpd

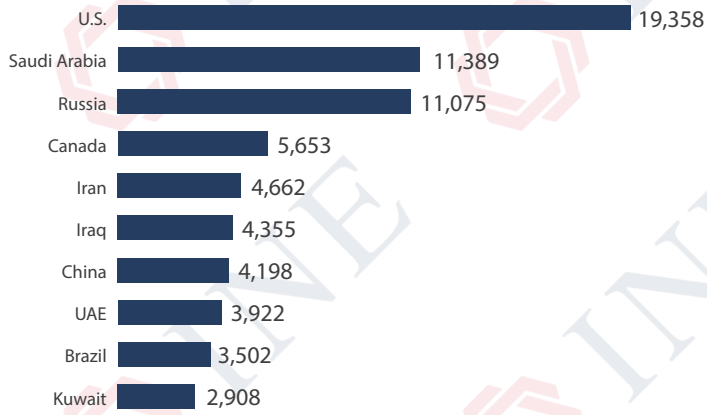



Exhibit 2: Global Distribution of Crude Oil Production in 2023

Source: EI, Shanghai International Energy Exchange

Unit: thousand bpd

The top oil consumers are the United States (18.984 million bpd), China (16.577 million bpd), India (5.446 million bpd), Saudi Arabia (4.052 million bpd), Russia (3.635 million bpd), Japan (3.366 million bpd), South Korea (2.797 million bpd), Brazil (2.567 million bpd), Canada (2.351 million bpd), and Germany (1.955 million bpd).

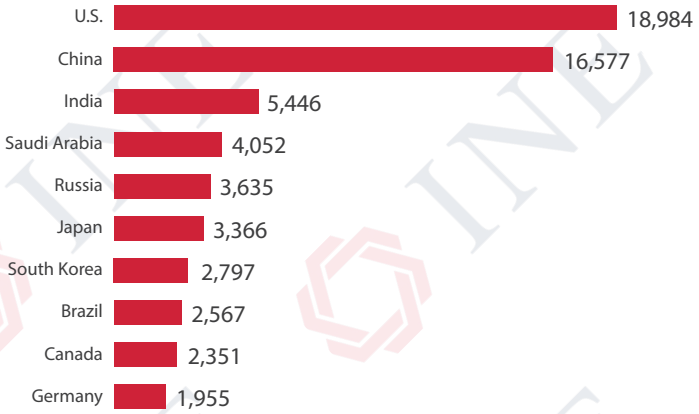



Exhibit 3: Global Distribution of Crude Oil Consumption in 2023
Source: EI, Shanghai International Energy Exchange
Unit: thousand bpd

## 15 What is the global trade share of world petroleum consumption?

According to the EI Statistical Review of World Energy 2024, in 2023, the international petroleum trade was 68.124 million bpd and the total consumption was 100 million bpd, meaning 67.8% of the oil consumed worldwide was delivered by international trade. In particular, China and Europe accounted for most of the import volume.

# 16 What are the world's top oil imports and exports by regions?

According to the EI Statistical Review of World Energy 2024, the top three countries/regions by oil imports are China, Europe and India. The top exporters were the Middle East, the U.S., and Asia-Pacific. The table below shows the import and export volumes by regions.

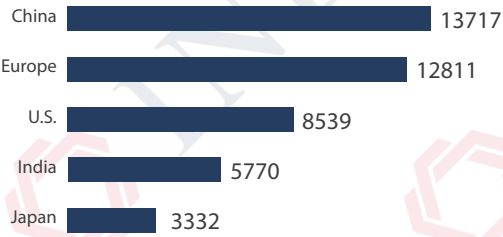



Exhibit 4: World's Top Oil Importing Countries/Regions in 2023

Source: EI Statistical Review of World Energy 2024

Unit: thousand bpd

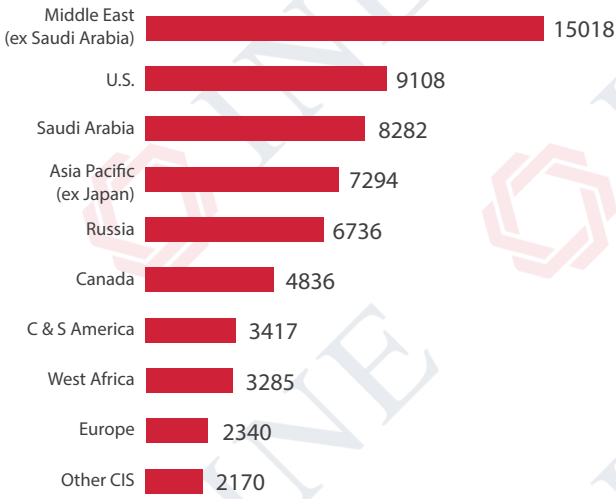



Exhibit 5: World's Top Oil Exporting Countries/Regions in 2023

Source: EI Statistical Review of World Energy 2024

Unit: thousand bpd

## 17 What are the world's oil majors?

The supermajors are ExxonMobil, Shell, BP, TotalEnergies, and Chevron, plus a few others.

## 18 What are the world's major national oil companies (NOCs)?

The world's major NOCs include Saudi Aramco (Saudi Arabia), Iranian Oil Corporation, China National Petroleum Corporation, Sinopec (China), Pemex (Mexico), Kuwait National Petroleum Company, Abu Dhabi National Oil Company, Sonatrach (Algeria), Petrobras (Brazil), Eni (Italy), Rosneft (Russia), State Organization for Marketing of Oil (SOMO, Iraq), Qatar Petroleum, and Statoil (Norway).

## 19 What are the major shipping lanes for the global oil trade?

Affected by where oil is produced and consumed, there are currently eight major shipping lanes for crude oil:

**Conduit 1 Strait of Hormuz**

The Strait of Hormuz, where Iran and Oman share territorial rights, is the world's most strategically important chokepoint, and is also considered a vital sea route for oil seaborne trade. A significant portion of oil from Saudi Arabia, the United Arab Emirates, Qatar, Iran, and Iraq is shipped to international buyers, mostly to Asia through the strait.

The Strait of Hormuz is deep and wide enough to handle the world's largest crude tankers.

As the Strait of Hormuz has been a strategic chokepoint for many years, it has often been the site of conflict and there have been many threats by neighboring countries to close it.

### Conduit 2 Strait of Malacca

The Strait of Malacca is the shortest waterway connecting the Indian Ocean, the South China Sea and the Pacific Ocean. Singapore, Malaysia, and Indonesia share the territorial right of the strait. Most of the Middle Eastern crude shipped through this passage is headed to China, Japan, and Indonesia. This strait is also vital oil sea route for Japan.

In contrast to the Strait of Hormuz, the Malacca Strait is one of the narrowest sea routes in the world with only 1.7 miles wide at its narrowest point, creating a natural bottleneck for shipping.

### Conduit 3 Cape of Good Hope

Although not a chokepoint, the Cape of Good Hope, located on the southern tip of South Africa, is a major trade route for Asia-bound West African crude.

The Cape of Good Hope is an alternate sea route for vessels traveling westward that need to bypass the Suez Canal or Bab el-Mandeb when they are closed. However, diversion around the Cape of Good Hope incurs significantly higher transport cost and shipping time. For shipments from Saudi Arabia to the United States, this route around adds 2,700 miles to transit distance.

### Conduit 4 Bab el-Mandeb

Bab el-Mandeb Connects the Red Sea and the Gulf of Aden and is the strategic link between the Mediterranean Sea and the Indian Ocean. It is only 18 miles wide at its narrowest point. Closure of the Bab el-Mandeb could keep tankers originating in the Persian Gulf from reaching the Suez Canal, diverting them around the southern tip of Africa, which would add to transit time and cost.

According to the US Energy Information Administration (EIA), most exports from the Persian Gulf that transit the Suez Canal also pass through Bab el-Mandeb, so closure of the strait would lead to serious consequences.

### Conduit 5 Danish Straits

The Danish straits connect the Baltic Sea to the North Sea and are among the most secure crude oil shipping routes in the world.

The Danish Straights also carry a relatively small portion of oil from Norway and the United Kingdom eastward to the Scandinavian markets. This means if Russia ever shut down the Danish Straits, it would also be cutting off its own oil export route to Europe.

### Conduit 6 Suez Canal

The Suez Canal passes through Egypt and the Isthmus of Suez and connects the Red Sea to the Mediterranean. Most of the oil passing through the canal is sold to markets in Europe and North America.

According to the EIA, the Suez Canal was expanded in 2010 to allow 60% of the world's tankers to pass through more effectively. The fall of President Hosni Mubarak in Egypt in 2011 and the resulting unrest did little to deter international shipping through the canal, but security of this vital link remains a primary concern.

**Conduit 7 Bosphorus Strait**

The Bosphorus Strait is a narrow stretch of water connecting the Black Sea to the Mediterranean. It splits Istanbul's Asian and European halves. Only half a mile wide at the narrowest point, the strait is among the world's most difficult waterways to navigate and an average of about 48,000 ships pass transit the strait each year.

According to the EIA, Russia has been shifting its oil exports away from the Black Sea and toward the Baltic Ports, while Azerbaijan and Kazakhstan have increased shipping through the Bosphorus Strait.

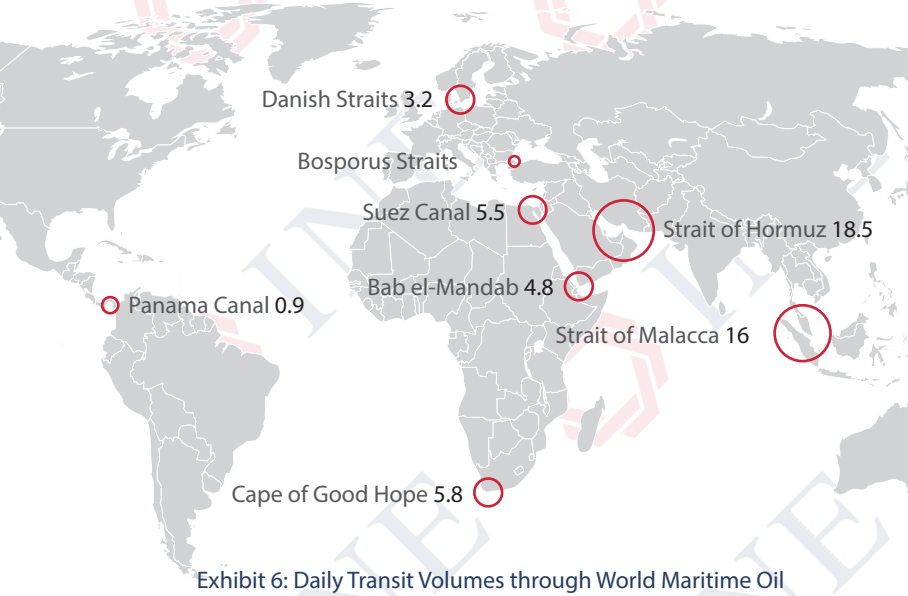



Exhibit 6: Daily Transit Volumes through World Maritime Oil Chokepoints

Source: EIA Unit: Million bpd

**Conduit 8 Panama Canal**

The Panama Canal connects the Pacific Ocean with the Caribbean Sea and the Atlantic Ocean. The utility of the Panama Canal has waned in the years since it was built. The narrowest point of the canal was only 110-feet wide, forcing larger supertankers to avoid the canal entirely. With an expansion program of Panama Canal completed on Jun. 26, 2016, it now allows larger ships to transit the canal.

## 20 How are freight rates for oil tankers calculated?

The international ocean freight cost of oil tankers is expressed in terms of value of Worldscale with main components being flat rates, differentials, demurrage rates, and terms and conditions.

### (1) Nominal freight rates

Worldscale is used to calculate freight rates for oil tankers and product carriers. Rates are prepared based upon a round trip voyage from loading port or ports to discharging port or ports and return to the location of first loading.

### (2) Differentials

Differentials are used to cover costs that do not fit in the Worldscale flat rate or their application may be dependent on particular factors. Costs that are not covered, such as canal dues differentials for Panama and Suez, different terminal costs that vary within the same port among other things, are enlisted in the Worldscale and will be added to the freight calculation when needed.

### (3) Laytime and demurrage

In Worldscale, standard time allowed for loading and discharging is 72 hours. The demurrage rate is multiplied by the number of days (or part of day) in excess of agreed laytime and calculated in USD. The demurrage rates in Worldscale depend on the size of the vessel (SDW in tonnes). The demurrage rate table, like other schedule of Worldscale, is revised annually to reflect the latest market rates.

### (4) Other terms and conditions

In accordance with traditional practice for international chartering, ship taxes or other charges levied on the ship are usually borne by the ship owner, while other taxes or charges levied on the goods are borne by the charterer. At present, the Worldscale is used to calculate freight rates for oil shipping. Market levels of freight are expressed in terms of a percentage or Worldscale equivalent or the nominal freight rate.

# 21 What are the types of regular oil tankers?

Based on the Average Freight Rate Assessment (AFRA) scale, tankers can be classified by deadweight tonnage as follows: General Purpose (10,000–25,000 DWT), Medium Range (25,000–45,000 DWT), Long Range 1 (45,000–80,000 DWT), Long Range 2 (80,000–1-0,000 DWT), Very Large Crude Carrier (160,000–320,000 DWT), and Ultra Large Crude Carrier (over 320,000 DWT). Other common types of oil tankers include Panamax (50,000–80,000 DWT) usually classified as LR1 tanker, and Aframax (80,000–120,000 DWT) and Suezmax (120,000–150,000 DWT) classified as LR2.

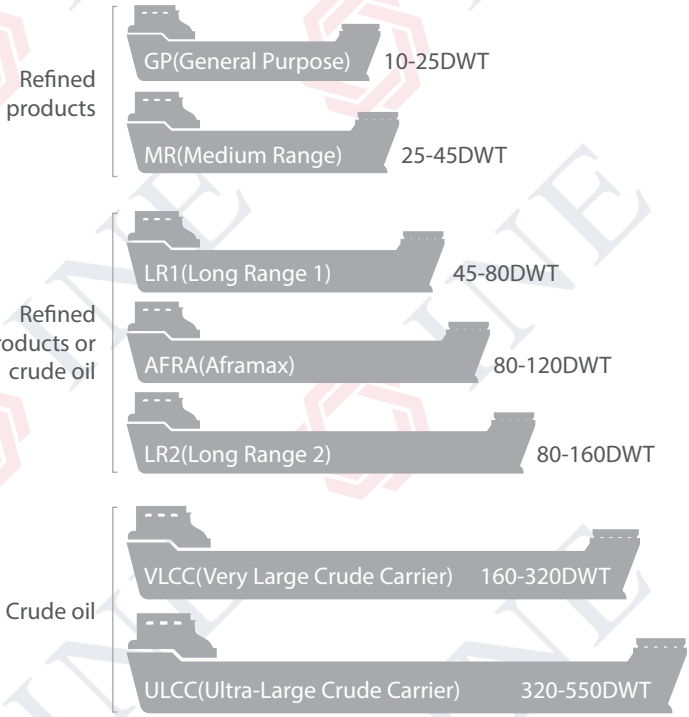



Exhibit 7: AFRA Scale of Tanker Capacity

Source: EIA


SEDCO
710
VCSB
SEDCO
710

# CRUDE OIL GEOPOLITICS

# 03

# CRUDE OIL GEOPOLITICS

## 22 Which international organizations play primary roles in the crude oil market? What are their roles in the oil market?

**Organization of the Petroleum Exporting Countries (OPEC)**

Founded in September 1960, OPEC is an intergovernmental organization of 12 member states as of February 2025. Its mission is to coordinate and unify the petroleum policies of its Member Countries and ensure the stabilization of oil markets in order to secure an e cient, economic and regular supply of petroleum to consumers, as well as ensure a steady income to producers.

According to the EI Statistical Review of World Energy 2024, OPEC production in 2023 was 1,597 million metric tons, accounting for 36.4% of the global total, Its proven oil reserves were at 171,800 million metric tons in 2020, or 70.1% of the global total.

**International Energy Agency (IEA)**

The IEA is a Paris-based autonomous intergovernmental organization established within the framework of the Organisation for Economic Co-operation and Development (OECD) in the wake of the 1973 oil crisis. It is composed of 32 member countries and 4 association countries. These member countries maintain a large stock of crude oil, mostly stored in the U.S., Europe, Japan, and South Korea, for emergencies.

In recent years, IEA member countries are holding as much as 1.3 billion barrels for emergency purposes and another 2.5 billion barrels for commercial purposes. This is equivalent to 114 days of their import needs. Since the IEA can release 12 million barrels of crude oil per day, the organization helps stabilize the market and mitigate price increases.

While a majority of surplus oil production capacity is controlled by OPEC, IEA member countries control significant amount of Strategic Petroleum Reserves (SPR). Either of them is capable of changing short-term market supply levels, which results in volatility in oil price.

**International Energy Forum (IEF)**

IEF is one of the major energy inter-governmental international organizations in the world, and was founded in 2002, headquartered in Riyadh, Saudi Arabia. Currently, IEF has 70 member countries, representing all six continents and both energy producers and energy consumers. Its biennial ministerial meetings are the world's largest gathering of energy ministers. IEF aims to foster greater mutual understanding and awareness of common energy interests among its members, promote dialogue between energy consuming countries and producing countries, and ensure the stability of global energy market.

# 23 Who are the member states of OPEC?

OPEC has 12 members and is headquartered in Vienna, Austria. Membership includes the five founding members of Iran, Iraq, Kuwait, Saudi Arabia, and Venezuela and the seven acceding members of Libya (1962), United Arab Emirates (1967), Algeria (1969), Nigeria (1971), Gabon (joined in 1975, terminated in 1995, rejoined in 2016), Equatorial Guinea (2017) and the Republic of the Congo (2018). There were four former members: Indonesia (joined in 1962, suspended its membership in 2009, rejoined in January 2016, and suspended again in November 2016), Qatar ((withdrew in January 2019), Ecuador (joined in 1973, suspended its membership in 1992, reinstated in 2007,and withdrew in January 2020), and Angola (joined in 2007 and withdrew on January 1, 2024).

Source: OPEC

# 24 What are the components of the OPEC Reference Basket (OPEC basket)? Why was the OPEC basket pricing system introduced?

The OPEC Reference Basket (OPEC basket or simply ORB) is made up of the following: Saharan Blend (Algeria), Girassol (Angola), Oriente (Ecuador), Zafiro (Equatorial Guinea), Iran Heavy (Islamic Republic of Iran), Basra Light (Iraq), Kuwait Export (Kuwait), Es Sider (Libya), Bonny Light (Nigeria), Qatar Marine (Qatar), Rabi Light (Gabon), Arab Light (Saudi Arabia), Murban (UAE), and Merey (Venezuela).

The OPEC basket is a comprehensive index reflecting the price of international oil trade. In the 1980s, oil prices plummeted due to the rising output from non-OPEC countries-oil revenues of OPEC countries fell 49.2% year-on-year in 1986. In response, in December 1986, OPEC chose the weighted average price of seven crude streams around the world as the target marker price for the organization. Members could use it as a basis for further adjustment based on their individual output quality and freight prices. The seven crude oils at the time were: Arab Light (Saudi Arabia), Saharan Blend (Algeria), Minas (Indonesia), Bonny Light (Nigeria), Dubai Crude (UAE), Tia Juana Light (Venezuela), and Isthmus (Mexico).

## 25 Why do Middle East geopolitics have such an influence on the oil market?

The main reasons why Middle East geopolitics can move the oil market are:

The Middle East has enormous proven oil reserves. This is especially true of Saudi Arabia which has 297.5billion barrels of oil reserves, accounting for 17.2% of the global total, and it produces about 11.389 million barrels a day on average. The countries with next three largest proven reserves are Iraq, Iran, and Kuwait with 145.0 billion, 157.8 billion and 101.5 billion barrels of oil reserves respectively.

Secondly, the region produces and exports huge volumes of crude oil, on which most of oil consuming countries are highly dependent. According to OPEC's January 2023 monthly report, OPEC member countries in the Middle East had an average daily crude oil output of 28.156 million barrels in 2022, which was nearly 88% of total OPEC production and about 31% of the total global supply.

Thirdly, the region has considerable spare oil production capacity, giving it a major influence on global oil prices. Saudi Arabia, the largest oil producer within OPEC and the world's largest oil exporter, has historically had the greatest spare capacity. It has regularly wielded this spare capacity for influence on the world stage and has helped set oil prices. Thus, it's been given the name of the "central banker" of oil.

As such, any turmoil or social unrest in the Middle Eastern oil producers will have a dramatic impact on the global oil market. An example of this is the Libyan civil war in 2011 that brought the nation's 1.6 million barrels of daily output to a near complete halt and drastically lifted the global oil price. In the ensuing months, Saudi Arabia quickly ramped up its production to make up for the Libyan supply disruption, playing a decisive role in taming further price hikes around the world. Another example is the EU's announcement of sanctions on Iran in early 2012 which caused an immediate spike in international oil prices.

## 26 Why does the United States have such a large influence on the global oil market?

The United States has a predominant influence on the oil market for several reasons. First, it is the biggest oil consumer in the world-the EI Statistical Review of World Energy 2024 reports that its consumption level was 18.984 million bpd in 2023.

Secondly, it is also one of the leading oil importers with 8.539 million barrels imported daily, making it a major influencing factor in global supply and demand.

Thirdly, as a superpower, the United States wields considerable influence in energy geopolitics.

Lastly, the United States has very sophisticated oil shale technologies that briefly made the country import-oil-independent in 2019.

# 27 How may the United States influence oil prices?

The United States may affect international oil prices in a number of ways:

First, the U.S. has established a complete strategic and commercial reserves system and releases the reserve data periodically. With the support of IEA, it has also created a joint mechanism to draw on the strategic reserves in case of emergencies.

Second, the U.S. has a sophisticated energy and financial market. Its oil futures are global oil benchmarks.

Third, the U.S. can also sway the international market as a supplier, owing to its considerable output level and the shale revolution.

# 04

# CHINA'S OIL MARKET

# CHINA'S OIL MARKET

## 28 What are the major oilfields of China? What are these major SOE oil producers' shares of domestic crude oil production?

China's state owned oil companies, mainly China National Petroleum Corporation (CNPC), China Petroleum & Chemical Corporation (Sinopec), and China National Offshore Oil Corporation (CNOOC), own most large oil and gas fields in China.

CNPC owns the Daqing, Changqing, Xinjiang, Liaohe, Jilin, Tarim oilfields; Sinopec has the Shengli, Zhongyuan, and Henan oilfields; and CNOOC controls the Bohai Oilfield. China's major oilfields and their production in year 2020 is tabulated in Appendix 1.

According to the International Petroleum Economics (Volume 4, 2021), the crude oil production of CNPC, Sinopec, CNOOC, and the Yanchang Petroleum Group over 2020 were 102.253 million metric tons (52.7%), 35.144 million metric tons (18.1%), 45.418 million metric tons (23.4%), and 11.202 million metric tons (5.8%), respectively.

## 29 What is China's share of global crude oil production and consumption?

According to the EI Statistical Review of World Energy 2024, as of the end of 2023, China produced 4.198 million barrels per day[1], accounting for 4.4% of the global share and ranked seventh in the world. It is the world's second largest oil consumer at 16.577 million barrels per day[2], or 16.5% of the global total consumption.

## 30 What are the oil production and import volume of China? How much does China depend on foreign oil?

China's National Bureau of Statistics reports that in 2024, China produced 213 million metric tons of crude oil, an increase of 1.91% year-on-year. Net import fell 1.95% to 553 million metric tons. The apparent oil consumption was 766 million metric tons, down 0.91%. The dependence on foreign oil was 72.19%, 0.77 percentage points lower than the year before.

[1]Includes crude oil, shale oil, oil sands and NGLs (natural gas liquids, the liquid content of natural gas where this is recovered separately). Excludes liquid fuels from other sources such as biomass and derivatives of coal and natural gas.
[2]Inland demand plus international aviation and marine bunkers and refinery fuel and loss. Consumption of bio gasoline (such as ethanol), biodiesel and derivatives of coal and natural gas are also included.

# 31 Who are the top crude oil suppliers to China? What are their respective shares of Chinese crude imports?

In 2024, the top 10 crude oil exporters to China were Russia, Saudi Arabia, Malaysia, Iraq, Oman, Brazil, UAE, Angola, Kuwait, and Qatar.

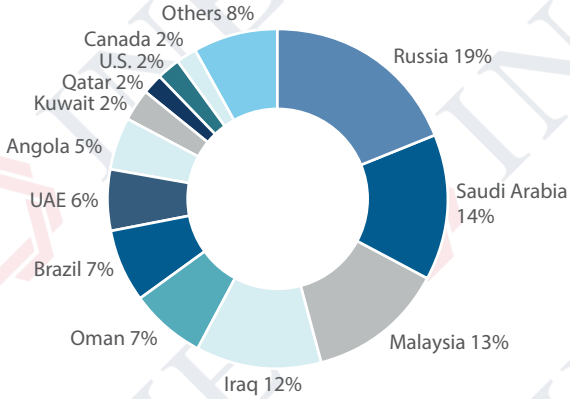



Exhibit 9: Sources of Imported Crude Oil of China in 2024
Source: General Administration of Customs

The Middle East is China's largest oil supplier in 2024 at 42.42% of the country's total import volume (Appendix 2). For this reason, the Shanghai International Energy Exchange (INE) chose medium sour crude oil, the predominant oil type China imports from the Middle East, as the underlying of its crude futures contract.

## 32 Who is entitled to import and export crude oil in China? Is a crude oil import quota approved by the government authorities required?

China oil SOEs are entitled to import and export oil freely for their own needs and freely. However, crude oil imports for privately owned entities are subject to quota and licensing control.

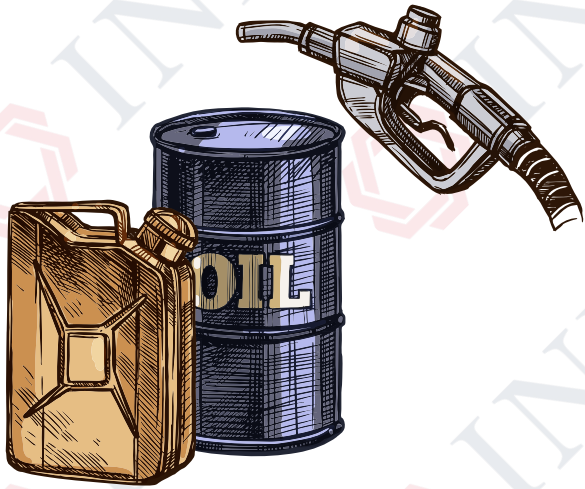
Oil imports and exports for SOEs and privately-owned entities are regulated independently. SOEs are granted automatic import and export licensing by the Ministry of Commerce (MOFCOM) and quota control are not applicable. SOEs that have automatic import and export licensing include SinoChem Group, Sinopec, CNPC, Zhuhai Zhenrong Co., and CNOOC.

Non-state import volume is in line with China's committed figure at its accession to the WTO. Starting from 2002, China began to issue the annual quota for crude oil import by non-state-owned enterprises. This quota is adjusted year-to-year. In 2015, the National Development and Reform Commission (NDRC) and the MOFCOM respectively issued the Notice on the Use and Management of Imported Crude Oil (FGYX [2015] No. 253) and the Notice on the Application by Crude Oil Processing Enterprises for the Non-State Trading Import License (SMH [2015] No. 407), to formalize the right to use and import crude oil by qualified local refineries.

According to the announcement of the Ministry of Commerce of China, the quota for non-state trade import of crude oil in 2023 is 179 million metric tons. (Appendix 4).

# 33 What is China's Strategic Petroleum Reserve (SPR) management? What is the current SPR stockpiling level and future direction?

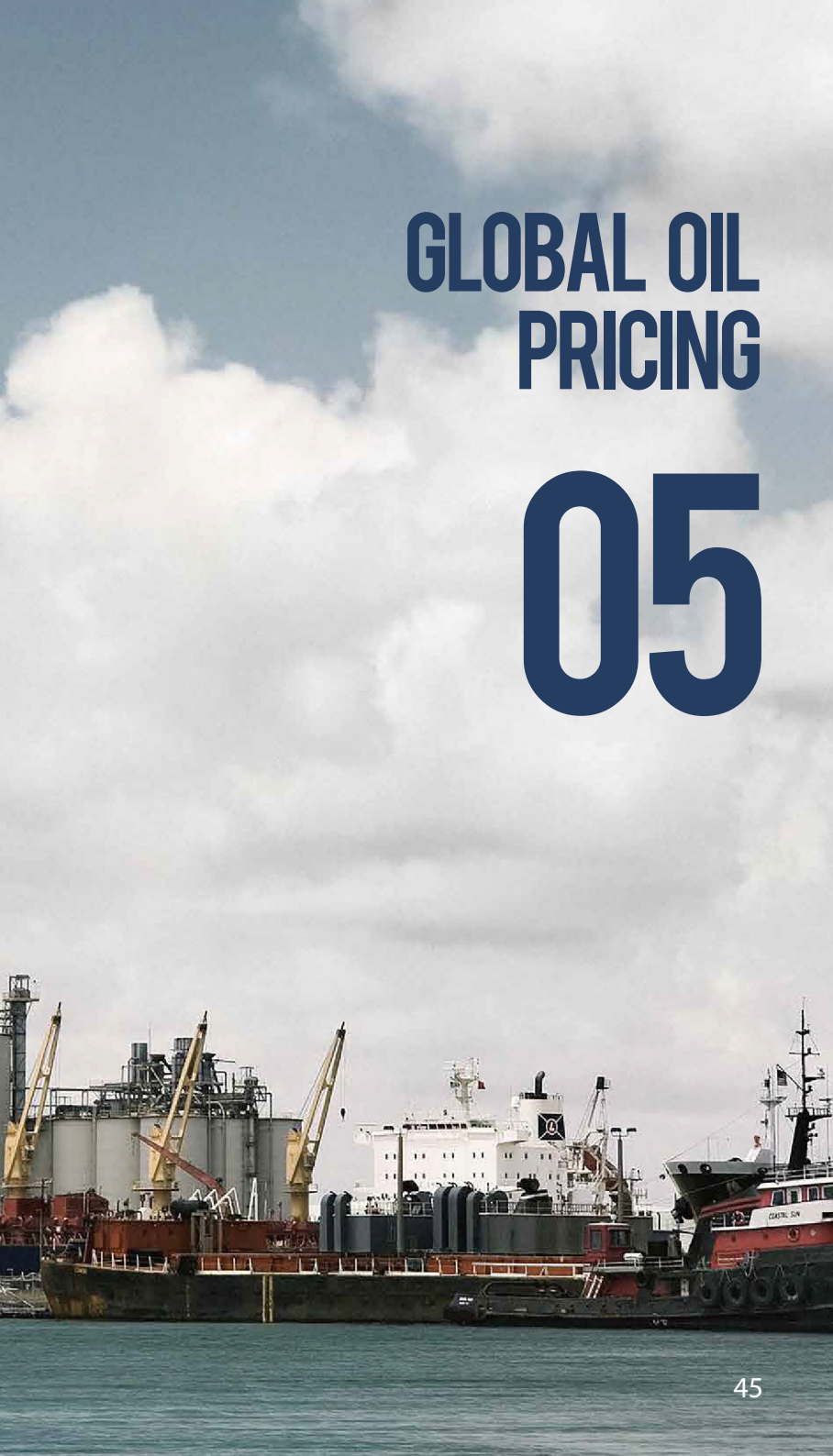
China's crude reserve system consists of the government's strategic reserves, enterprises' mandated commercial reserves, and enterprises' inventories for production and operating activities. Currently, China's dependence on foreign oil has exceeded 70%. In the long run, the demand for oil will fall as China works toward the Dual Carbon Goals, but oil will remain a key energy and chemical raw material, thus the SPR stockpile will still be critical to China's energy and economic security.




RINKER
CONTINENTAL

# GLOBAL OIL PRICING

# 05



# GLOBAL OIL PRICING

## 34 Why are futures market prices the references prices for most of the oil traded around the world?

Oil price fluctuations impact the global economy and geopolitics. To manage the risk of price fluctuation, financial markets around the globe have introduced crude oil futures for refiners, government buyers as well as other market participants. Trading of these benchmark crude futures has soared rapidly since launch, as has their influence on the physical market for the following reasons:

Firstly, the crude oil futures market has a wide range of participants, including producers, refineries, traders, consumers, investment banks, hedge funds and other types of investors. Therefore, the price of oil futures reflects the expectations and judgements of market participants.

Secondly, highly liquid crude futures are traded publicly and transparently on Exchanges, and the trade data is published/ distributed in real time. All of which promote more efficient price discovery and effective safeguards from market manipulation.

Therefore, oil trading is increasingly relying on the futures price with a certain premium or discount to account for quality variation, geographical location, and other factors thus making futures prices an oil benchmark.

# 35 Are the prices of refined products anchored to the price of crude futures in global oil market?

Crude oil futures prices are key references in defining prices of refined oil products. In fact, because the oil price is one of the most important determinant of the price of refined products, they are highly correlated and mutually influential:

(1) The spread between the prices of crude futures and oil product futures often stays within a narrow range, thus changes in crude oil futures prices can lead to changes in prices of refined products. As a result, the price expectation of refined oil product futures is often set as a premium or discount value against the price of crude oil futures.

(2) In places where the price of refined products is determined by market forces, the theoretical and futures prices of crude oil can be derived from the price of refined products, namely, crude oil price = weighted average market price of refined oil products by production yield – refining cost or gross profit – taxes.

## 36 Who are the world's major oil price reporting agencies (PRA)?

Platts and Argus play a crucial role in determining how oil prices are set, while agencies including ICIS and RIM also offer similar services. Global information vendors such as Reuters and Bloomberg also broadcast PRAs' oil prices and industry updates.

Platts and Argus prices of energy are widely used by oil companies and government agencies.

## 37 How do PRAs like Platts and Argus assess oil prices and how do their prices influence oil market?

Taking Singapore market as an example, Platts reporters consider information collected through the day, with a particular focus on the half hour prior to 16:30 Singapore time, which makes its price more relevant to the Asia futures market's closing price. Platts claims that its assessment takes into account the effect of time on price. While Argus typically reflects physical market prices across the entire trading day as a volume-weighted average of deals done. Argus tracks as many transactions as possible. Argus believes an entire trading day price is a reliable indicator of physical market values as it incorporates the broadest possible pool of spot market liquidity and has acceptance from industry

Currently, Platts prices have taken a significant role in the determination of oil prices in the Asia-Pacific region, as their Dubai-Oman is a pricing benchmark applied to the vast majority of sour crude oil trading east of Suez. As for Argus, its Argus Sour Crude Index (ASCI) has become the pricing benchmark for sales of crude oil by Saudi Arabia, Kuwait, and Iraq to the United States, and its ESPO (East Siberia – Pacific Ocean) and AFEI (LPG) (Argus Far East Index) prices also have major influence in the Far East.

# 38 What are the pricing conventions used by Middle Eastern countries and Russia for oil exports?

**Middle Eastern countries:**

International oil trade is organized either through the spot (cash) market or through long-term contracts, however, bilateral long-term contracts are the leading form of oil trading. For spot market transactions, the trading parties typically base the pricing of an oil delivery to a benchmark (marker) price with an agreed price differential applied at the time the shipment is loaded. For long-term contracts, most oil exporting countries publish their official selling prices (OSP) on a monthly basis against their long term export contracts. The OSP could be either an absolute price for each crude stream (such as Oman), or a formula-based price consisting of a published premium or discount to a specified reference price (such as Saudi Arabia, Iran, Iraq, or Kuwait).
Of the two, the formula-based pricing is the mostly used in long-term oil contract transactions.

The principal oil pricing formula is **P = A + D**, where P refers to the settlement price for a delivery of crude oil, A the benchmark price, and D the premium or discount.

It is worth noting that benchmark (marker) crude price is not a traded price of certain crude stream at a specific time, but rather a reference price calculated by reference to a set of spot markets, a futures price, or a PRA's index (such as MOPS or Means of Platts Singapore) prices during an agreed sampling period. For a list of pricing benchmarks used by major Middle East oil producers please see Appendix 5 of this document.

**Russia:**

The export price of Russian Urals crude oil is quoted as a floating price relative to Brent, the marker crude in the European market. Russia has listed Urals crude oil futures contracts for trading.

Some ESPO (Eastern Siberia–Pacific Ocean pipeline) Blend is traded through tender auctions, where producers will announce a tender notice, enlist the auction procedure and invite certain buyers to bid. Goods are sold to the highest bidder.

## 39 What are the major benchmarks for oil trading in the Asia-Pacific region?

At present, there are several benchmark prices used in Asia-Pacific oil trading. They are Dubai/Oman and Platts Oman and Dated Brent. For example, the spot trade of crude oil exported from the Middle East to the Asia-Pacific region is mainly based on Dubai / Oman prices. Dated Brent is adopted in pricing Asia-Bound West Africa Crude. In addition, Reuters reports that since the listing of the GME (Gulf Mercantile Exchange) Oman crude futures (OQD), the pricing reference for oil exports from Iraq, Saudi Arabia, and Kuwait to Asia has switched to the average monthly OQD prices and the average spot price assessed by Platts, rather than the average Oman and Dubai prices assessed by Platts as before.

# 40 How is crude oil priced differently in Asia-Pacific as compared with North America and Europe?

Crude oil is priced differently in Asia-Pacific as compared with North America and Europe. In North America and Europe, the import price is based on the futures price of where the crude oil is consumed; in Asia-Pacific, it is based on the spot price of the production area.

About 50 percent of the oil imported into China is from the Middle East, where medium sour oil predominates. Consequently, the crude oil futures contract listed by INE on March 26, 2018 sets medium sour crude oil as the deliverable. Following its launch, the contract has been an effective indicator of the local supply and demand situation. But before its introduction, oil importers in Asia were exposed to oil trade risks due to the lack of a sophisticated crude oil futures market in the region that could facilitate hedging and risk management.

# 41 What are the pricing models for crude imports and domestic production in China?

**Import Market:**

For oil imports from the Middle East, the pricing benchmark is primarily the Platts Oman/Dubai average price; for oil imports from West Africa, its Brent.

**Domestic Market:**

The prices for trading domestic produced oil is negotiated between CNPC and the Sinopec Groups, who are the two biggest of China State-owned Oil Companies (SOE) and own most of China's inland oilfields. For intra company transactions of domestically produced crude, the price will be determined by the corporate headquarters. Because there currently is no regional/domestic oil benchmark, prices of different quality oil are usually determined in reference to nearby overseas benchmarks of similar quality. In China, crude oil is usually classified into four categories: Light, Medium I, Medium II, and Heavy Oils; and respective nearby overseas oil benchmarks for these four categories of oil are Tapis, Minas, Cinta, and Duri. The timely introduction of China's own crude oil futures may help China move away from this indirect pricing model.

# 06

# FUTURES AND DERIVATIVES MARKET

# FUTURES AND DERIVATIVES MARKET

## 42 What are the basic attributes of a successful futures contract?

Nearly all successful futures products share certain common attributes, including: underlying commodities traded must be homogeneous and/or have a well-defined grading system; there is a large enough cash market; the cash market must be active with frequent transactions; there is no absolute dominant power on either the buyer or seller's side; there is high price volatility that gives rise to hedging needs; and user base is fully diversified to provide good liquidity to the futures market.

China has become the second largest oil consumer and biggest importer in the world and has a remarkable oil trading volume. Plus oil price remains quite volatile as usual. Hence domestic oil-related enterprises have strong hedging needs. In China futures market, there is already a very diversified and large number of market participants. Therefore, China crude oil has been equipped with many natures for a successful futures contract.

# 43 What are the arbitrage strategies commonly used by futures dealers?

In contrast to directional trading which involves holding one side (long/short) of the market, arbitrage trades generally involve simultaneous execution of buy and sell orders of multiple contracts and make profits from normalizing an abnormal price or price relationship between two correlated contracts. Common forms of arbitrage trades include calendar spreads, inter-market or inter-commodity spreads, which can be executed by simultaneously placing buy and sell orders or trading a spread contract.

Here is a demonstration of arbitrage trading using a calendar spread example: A merchant finds that the ICE July ULSD futures is traded at $3 per barrel lower than the August contract. After counting in the monthly storage cost of $1 per barrel and other cost factors for carrying over a July contract, there is still almost a $2 per barrel arbitrage window. As such, the merchant may immediately buy the July contract and simultaneously sell the August. If the spread converges by the end of July, the merchant can make a profit by closing out his positions. Otherwise, the merchant can choose to take physical delivery in July and pay $1 per barrel for storage and other carry cost. Then make delivery at August for his short positions, making a risk-free net profit of $2 per barrel.

# 44 Why are arbitrage strategies more popular to proprietary traders than directional trades?

Reasons for proprietary traders and speculators prefer arbitrage strategy include:

1. 1.The price risk of directional trades is generally larger than arbitrage strategy, as up/down-side risk of uncovered position is unlimited;

2. Other than fundamental factors of oil supply and demand, there are other factors that will impact the result of a directional trade, including the strength of the US dollar, macro-economic events, investors' risk taking limits, and volatility passed through from other financial markets (such as stock markets). By contrast, arbitrage strategies involving oil contracts may be relatively more impacted by the relationship of demand and supply as simultaneous long and short positions offset many other risk factors.

3. Arbitrage trading typically reduces the capital requirement for margining purposes compared to directional trades enhancing client's capital efficiency.

# 45 What is the speculators' market share in futures market trading volume?

While it is safe to say that speculative trading account for a relatively high share of oil market volume, accurate public statistics are rare, and the number may vary from market to market.

The only widely accepted data today are the Commitments of Traders (COT) reports published weekly by the Commodity

Futures and Trading Commission (CFTC). The COT classi es futures traders into four categories: Producer/Merchant/Processor/User, Swap Dealers, Managed Money, and Other Reportables. If Other Reportables and Managed Money are attributed to speculators, then based on the position holding of NYMEX WTI futures in mid-February 2025, speculators account for 50% of the total open interest. Speculative trading would account for an even higher stake in market trading volume because they generally trade more actively than other types of market participants. However, the distinction between hedging and speculation in futures market is less clear than it may appear, as other traders may also engage in speculative trades.

## 46 What role does speculators play in the development of futures markets and the price discovery process? Do they manipulate the futures market?

Futures market function less efficiently without speculative traders providing liquidity and assisting with price discovery. Moreover, the liquidity brought by speculative traders' frequent trading activity may attract more hedgers or investors to participate in futures trading. Therefore, speculation is indispensable in the futures trading ecosystem.

Speculation is often mistaken for price manipulation, but this view lacks objectivity and fairness. Under certain market conditions– such as low market liquidity, inefficient regulation, or excessive speculation, speculation may create an opportunity for market manipulation. What a futures market really needs is a solid regulatory infrastructure and robust surveillance system to inhibit market manipulation.

## 47 What are common forms of market manipulation? What regulatory countermeasures are adopted to prevent such behavior?

Market manipulation is considered criminal/illegal activity and prohibited in the Chinese Criminal Law, the CSRC's Regulations on the Administration of Futures Trading and in Exchange Rules, where the Exchange is a self-regulatory body. Market manipulation comes in many forms. In the Regulations on the Administration of Futures Trading, examples of price manipulation in futures markets are defined below:

1. acting individually or in concert to engage in ongoing trading activity in order to exploit a relative capital advantage, relative significant long or short sided position-holding, or using inside information to squeeze the market or manipulate futures prices;

2. colluding with other traders to conduct wash trades, simultaneously executing trades at a pre-arranged time(s), and/or price(s) in order to artificially affect futures trading prices and/or trading volume;
3. churning or wash trading by using self-owned accounts or other accounts under common controlling interest to change futures prices and/or trading volumes significantly;
4. Violating Exchange position limits in order to control of the supply or the underlying commodity asset and corner/squeeze the futures market; and
5. other forms of manipulation as prescribed by the CSRC under the State Council.[3]

To address manipulative activity, China futures exchanges implement enforced rules of "one trader one ID" rules, position limit, large trader position reporting (LTPR), require filing documents attesting to ownership and control of accounts and other preventive rules. In practice, the Exchange is empowered to conduct real-time market surveillance and monitor media manipulation, investigation on possible ownership and controlling relationship cases, on-site inspection, and other actions to detect, investigate, and take actions against manipulative activities. As the market continue to evolve, regulators and Exchange may be obligated to take additional steps to guard against fraud and market violation.[3]

[3]On February 15, 2019, the CSRC publicly solicited opinions on the draft of the provisions of article 70, paragraph 1, item 5 of The Regulations on Administration of Futures Trading (hereinafter referred to as the Provisions). There are seven articles in the Provision. Article 1 is the regulation basis, the second to fifth articles clearly prohibit four kinds of manipulation of the futures trading price, including false declaration, delude, insider trading, and squeeze. Article 2 prohibit any entity or individual asking/bidding a contract for the purpose of affecting the futures trading price, engaging in a transaction which is contrary to their declared direction, and seeking other illegitimate interests. Article 3 states any entity or individual is prohibited from fabricating or disseminating false or misleading information to affect the futures trading price, including conduct relevant transactions and seek other illegitimate interests. Article 4 prohibit any institution or personnel from engaging in futures investment consulting business, or any other subject with market influence, to make public evaluation, prediction or investment suggestions on the futures contract, in order to affect the futures trading price, and to conduct futures trading contrary to the direction of its evaluation, prediction or investment Suggestions; Article 5 prohibit any entity or individual, individually or jointly, to use improper means to circumvent the restriction on holding positions in the near delivery month or delivery month contract, so as to form an advantage of holding positions and affect the futures trading price. Article 6 is the liability clause. Article 7 states the effective date.

# 48 Why do foreign futures exchanges list other exchange's contracts? Is this a form of competition or cooperation?

In 2006, ICE took the lead in listing the WTI Crude Oil Futures on its electronic platform; soon thereafter, the New York Mercantile Exchange (NYMEX) also listed the Brent Crude Futures for trading. For investors, trading the futures products of multiple exchanges through a single platform brings many benefits: (1) The margin required will be significantly lower; (2) It helps prevent the situation where one has to pay a large tax in one market and cannot obtain a corresponding tax refund in another; and (3) It also simplifies account opening procedures and trading position reporting with different exchanges, while increasing trading and capital efficiency.

Cross-listing of contracts agreed by two different exchanges could embody competition and cooperation in the same time. On one hand, by listing another exchange's product, one may attract customers from another competitor exchange. On the other hand, a more complete and various product line on a single platform may draw in more potential investors. It also stands for mutual recognition of successful contracts originated from other exchanges, which may attract more diversified investment and enhance market liquidity of the market overall.

# 49 What are other common derivatives contracts traded on exchanges?

In addition to futures contracts, other common oil-related contracts traded on foreign exchanges include options, swap futures, and spread contracts. Below are definitions of these derivative products:

**Options:**

Options are contracts between a buyer and a seller, wherein the buyer, after paying a certain sum (known as the "premium") to the seller, acquires the right, but not the obligation, to, depending on the option, either buy from or sell to the seller a specific quantity of the underlying asset at a pre-determined price ("strike price"), either at any time before the option expires (in the case of an American option) or at a particular future date (in the case of a European option). For example, if a company buys, at $1 per barrel, a call option for 100,000 barrels of Brent which expires in one month with a strike price of $50 per barrel, the company can be assured that, with the $1 per barrel it has paid, it will only cost the buyer at a maximum price of $5,0 00,000 to buy 100,000 barrels by the expiry of the call option (excluding the cost of the option premium and any transaction fees). If the market price of Brent increases to $60 per barrel prior to expiry of this contract, the buyer may exercise the option and get the 100,000 barrels of Brent and pay $10 dollars below the current market price. If, on the other hand, the price of Brent drops below $40 per barrel, the company may choose to buy Brent in spot market rather than to exercise the option.

**Swap Futures:**

Commodity swaps are mostly traded in the over-the-counter (OTC) market and represent over 80% of OTC transactions. An increasing number of them are centrally cleared. Contrary to many futures, swaps are cash settled. A typical swap is often an agreement whereby a floating price is exchanged for a fixed average price of certain corresponding benchmark (such as a futures contract marker prices or settlement prices) over a specified period. For example, if party A (physical buyer) does a one-month long swap with bank B for buying 100,000 barrels of Brent crude at $50 per barrel against ICE Brent in April, the swap will be settled to the arithmetic mean of the futures daily settlement prices from April 1 to April 30. If the mean comes out to be $55 per barrel, it means party A's average cost of buying Brent is $55 dollar/barrel in April, however bank B will pay the $5 per barrel to party A for settlement of the swap of $500,000 (100,000 barrels * $5/barrel). Conversely, if the mean is $45 per barrel, then party A's average cost of purchase the spot crude is lower, however, it has to pay $5 per barrel to bank B for settlement of the swap deal (totaling $500,000).

**Spread contract:**

Spread trades are a popular trading strategy. There are three main types of spread trades: calendar spreads, inter-exchange spreads, and inter-commodity spreads. For instance, a spread trade using the March and the April Brent Futures Contracts is a calendar spread; a spread trade of Singapore Fuel Oil versus SHFE's Fuel Oil futures is an inter-exchange spread; and spread trade involving buying and selling of Singapore Fuel Oil 180 CST and Singapore Fuel Oil 380 CST futures contracts is an inter-commodity spread.

## 50 Is there any relationship between OTC derivatives and exchange-traded futures?

Common OTC transactions include swaps, options, and exotic options, some of which are settled against/derived from exchange-traded futures prices. Compared to exchange-traded derivatives, OTC markets are characterized by market participants trading directly with each other and may be more customized in terms of underlying asset quality, contracted quantity, contract expiry date, (for options or forwards) strike price. However, exchange-traded futures have advantage of higher liquidity, transparency, and lower counterparty credit risk with an exchange as a Central Counterparty (CCP). Sometimes market makers in OTC transactions will back-to-back hedge OTC market exposure using exchange-traded futures contracts, thus generating symbiotic relationship between the two markets.

## 51 What are the respective trading volumes of the OTC market and the exchange-traded derivatives market?

OTC market is by far the larger of the two, both in terms of volume and product range, while the exchange market only plays a supplementary role.

# 52 What are the future for OTC and exchange-traded derivatives markets? What is the centralization of the OTC market?

During the financial crisis of 2008, a large number of companies suffered losses from trading derivatives in the OTC market due to misleading market information and inadequate risk management. As a result, certain OTC markets contracted in the wake of the financial crisis, while the centralized trading platforms for futures and options maintained a relatively stable growth in trading volume.

OTC derivatives are bilateral agreements often traded by customers directly with banks. Historically, OTC markets were largely unregulated characterized by little transparency and subjected participants to substantial counterparty credit risk. More recently, countries around the world have been strengthening the regulation of OTC derivatives markets. In July 2010, the Dodd–Frank Wall Street Reform and Consumer Protection Act was signed into United States federal law, which is perceived as the most comprehensive and stringent financial reform law yet introduced since the Great Depression. Among its many reform measures, this Act particularly provides for enhancing the regulation of OTC derivatives and promoting the standardization and central clearing of OTC trades. Singapore then followed and imposed similar requirements. All major exchanges such as ICE and CME Group have also started listing contracts that were used to be traded in OTC market– such as swap futures and options, and providing clearing services for OTC trades. Thus, in the order to support enhanced regulation of OTC markets and lower counterparty risk, of the concept of centralized OTC markets is now gaining prominence.

# INTERNATIONAL CRUDE OIL FUTURES MARKET

# 07


NABORS 21-E

# INTERNATIONAL CRUDE OIL FUTURES MARKET

## 53 What are the international exchanges that currently list crude oil futures? How are their trading scales and extent of market influence?

About a dozen exchanges worldwide list crude oil futures today. The two most influential are NYMEX, part of the CME Group, and the Intercontinental Exchange (ICE). The NYMEX WTI Crude Oil futures and ICE Brent Crude futures, accordingly, are the respective benchmark in the United States and Europe. Other important benchmarks are INE's Shanghai crude oil futures and Gulf Mercantile Exchange's Oman crude oil futures. Notably, INE's contract, listed merely a few years ago, has become the third-most-traded crude oil futures contract in the world.

According to the latest data from the Futures Industry Association (FIA), the top three most-traded crude oil futures and options contracts in 2024 were Multi Commodity Exchange's crude oil options, ICE's Brent crude oil futures, and NYMEX's WTI crude oil futures; INE's Shanghai crude oil futures ranked sixth.

Annual trading volume of above contracts in 2024 is listed in Appendix 6.

## 54 What is the underlying crude or quality for WTI and Brent futures?

The underlying for WTI (West Texas Intermediate) futures listed on NYMEX is a light sweet crude oil. Besides, WTI futures contracts can also deliver other crudes included in the DSW (Domestic Sweet Streams). The underlying for brent futures is a light sweet crude produced in the Brent and Ninian oil elds in the North Sea region of the North Atlantic Ocean. Currently, the delivery grades of Brent are BFOETM (Brent Blend, Forties, Oseberg, Ekofisk, Troll, and WTI Midland).

## 55 Who are the main participants in the international crude oil physical and futures markets?

Main players in physical market include oil producers (e.g., Qatar Petroleum), refineries (e.g., CNPC), international oil companies (e.g., Shell), trading houses (e.g., Mercuria), investment banks (e.g., Morgan Stanley) and so on.

Participation in crude futures market is more extensive, including not only the above-mentioned participant types, but also hedge funds, mutual funds, insurance companies, investment banks, commercial banks, retail investors, and end-user/downstream industries, such as airlines and shipping companies.

## 56 Why is there a trading price differential between different crudes? Is there a reasonable range to the spread between two crude streams?

Different crudes indeed trade at different prices in the spot market, for a number of reasons. Firstly, the quality of different crudes (API gravity, sulfur content, and other indicators) varies greatly. In general, light sweet crude oils are priced higher than heavy sour crude oils. Secondly, changes in supply and demand may also lead to changes in the price differentials, and oil companies will adapt sales strategies to the specific supply and demand situation of each region. For example, when a huge refinery that only processes one certain crude is shut down by fire, it may weaken the demand and price for that crude, which may widen its spread against its marker. Lastly, the same crude may be traded at different prices in different locations. Thus, there may be a geographical price spread for the same crude stream.

Oil price differences generally will trade within a certain range over a given time frame, otherwise it may produce arbitrage trade opportunity. Also, market forces are such that the combination of, oil producers' reluctance to produce and increased consumers' demand will tend to force prices higher when oil price is too low, and vice versa. This interplay between supply and demand typically bring the price differentials back into a reasonable range.

## 57 What is a market maker? How do market makers contribute to the futures market? Are market makers introduced in the Chinese crude oil futures market?

To maintain market liquidity and address the investment needs of public investors, market making was introduced in the futures

market long ago. A designated market maker require to meet certain quality criteria and must has good faith to continuously provide bid/offer quotes in specified futures contracts, and stand ready to buy and sell those contracts on a regular and continuous basis at a publicly quoted prices using their house accounts. The function of market making is to provide and maintain market liquidity at all time when market is open and enhance liquidity of all contracts, especially for those that may lack liquidity. As such, market making is crucial for newly listed contracts and inactive far-month contracts.

To ensure the smooth function of the market maker system, robust market making laws and regulations are required to define the rights and obligations of market makers. INE has issued the Market-Making Management Rules and introduced the market-making mechanism for shanghai crude futures.

## 58 Is physical delivery necessary for a crude oil futures?

No, cash settlement may also work. For instance, Brent crude has a sophisticated and liquid spot market, and its futures contract that is traded on ICE is cash-settled against ICE Brent Index (cash market price of Brent) at contract expiry.

Compared with cash settlement, physical delivery will better link its futures prices to the spot market. As physical delivery will force the prices of futures and cash to converge, the integrity of the contract enables the futures market to better support the physical market.

Commodity futures already listed in China, including crude oil futures, are all physically deliverable.

# DESIGN OF CHINA'S CRUDE OIL FUTURES CONTRACT

# 08

# DESIGN OF CHINA'S CRUDE OIL FUTURES CONTRACT

## 59 What is the significance of developing China's own crude oil futures market?

In order to provide a marketplace for the wide variety of investors who need to manage price risk, and to help to support business sustainability, China needs to form its own crude futures market. Though there are sophisticated and highly liquid oil futures markets in Europe and North America already, their prices from do not reflect the supply and demand of crude oil in the Asia-Pacific region. A Chinese crude oil futures contract may help create an oil benchmark price capturing the dynamic of China and the Asia-Pacific oil market. Thus it will optimize oil resource allocation in this regional market and better serve commerce and the economy. Establishment of the crude oil futures market is one of the key steps taken by China to open upand internationalize its futures market.

## 60 What are the government policies for supporting China's crude oil futures?

In April 2015, MOF and SAT issued The Notice on the Value-Added Tax Policies for the Bonded Delivery of Crude Oil and Iron Ore Futures Contracts, which provides that the bonded delivery of crude oil futures is to be VAT-exempt until further notice. In June 2015, the CSRC issued the Interim Measures for the Administration of Overseas Traders' and Overseas Brokers' Engagement in the Trading of Specified Domestic Futures Products, which determines

Shanghai crude oil futures as one of the specified domestic futures products and provides rules and regulation regarding the access of overseas investors and brokers, laying the foundation for the law of China's futures market opening to the world. Later on, in July 2015, the People's Bank of China issued the notice on the Administration of Cross-border Settlement for Onshore Crude Futures Trading.

In the same year on July 31, the State Administration of Foreign Exchange has issued a Notice on the Administration of Foreign Exchange for Overseas Traders' and Overseas Brokers' Trading of Specified China Futures Contracts, which is different from QFII and Shanghai-Hong Kong stock connect, providing an innovative and suitable method for futures market to supervise and manage the foreign exchange. In August 2015, the General Administration of Customs issued the Customs Administration for Bonded Delivery of China Crude Futures Contract to support the development of bonded delivery business of crude oil futures.

In February 2018, the former General Administration of Quality Supervision, Inspection and Quarantine issued the Notice on the Administration of Quality Supervision and Inspection of Crude Oil Futures, which clarified the requirements of inspection and supervision of crude oil futures. In March 2018, the Ministry of Finance and the State Taxation Administration issued the notice on the Futures Trading and Income Tax Exemption for offshore institutional and individual traders temporarily.

These policies have laid a solid foundation for INE to provide a more convenient and international standard trading platform for China's crude oil futures, and a user-friendly futures trading environment for domestic and overseas traders.

# 61 What are the general principles behind the contract design of China's crude oil futures?

The design of China's crude oil futures contract is based on four principles: Creation of an Internationalized Platform, Net (of tax) pricing, Bonded Delivery, and RMB Price Denomination. "Internationalized Platform" means trading, clearing & settlement, and delivery at INE adopts global standard so the market is freely, efficiently, and conveniently accessible to onshore as well as offshore investors– including global oil companies, oil trading houses, and investment banks. The aim is to accelerate the formation of a new oil benchmark that reflects the supply and demand characteristics in China and the Asia-Pacific region via active international participation and acceptance of the new futures contract. "Net Pricing" means a clean price prior customs duty and VAT, different from after-tax pricing of other futures contracts listed on other China futures exchanges. This arrangement facilitates direct comparison with other global oil futures prices, and eliminates the impact on the futures price of any tax policy change. "Bonded Delivery" means physical delivery performed using a commodity which is under bonded supervision and within the bonded supervision premises as the underlying product for delivery. The main purpose for this practice is that the spot market of bonded commodity goods is net priced prior to the imposition of tax, and more types of participants are allowed to trade in this market than in the Chinese domestic market. As such, bonded oil terminals act as a link between the domestic and overseas oil markets, making trading and delivery of bonded commodity goods more accessible to global spot market and derivative traders. "RMB Denomination" means daily settlement variation and physical delivery settlement of crude futures contract are denominated in Renminbi, while US dollar and other foreign currencies specified by the Exchange are acceptable as margin collateral.

## 62 What is the role of INE as a central counterparty (CCP)?

In January 2019, the China Securities Regulatory Commission (CSRC) formally approved the Shanghai International Energy Exchange (INE) as a 'Qualifying Central Counterparty' (QCCP). This indicates that after taking the lead in listing the globalized crude oil futures, INE has further improved its international industry standards, enhanced the ability of market risk prevention and control, and laid a solid foundation for the future development.

As a Central Counterparty (CCP), INE will interpose itself between counterparties upon execution of a futures trade, becoming the seller to the buyer and the buyer to the seller, adopt the net settlement method, and ensure all settlement and delivery for centralized futures trading. Furthermore, the General Exchange Rules of INE provide that the legal attributes of property rights derived from activities such as trading, clearing and delivery of executed orders, positions closed, cash received as margin, assets either pledged or transferred as margin collateral, standard warrants paired for delivery, or those actions adopted by the Exchange against any default event, shall not be revoked or considered null and void due to initiation of bankruptcy proceedings against any Member, and that in the event that a Member enters into bankruptcy proceedings, the Exchange may still conduct net settlement for such Member's positions in accordance with the General Exchange Rules and the other specifically related rules.

## 63 How will INE strengthen its risk management systems to support the globalized futures market?

INE will strictly implement measures that have been proven effective in China's other futures markets, such as pre-margining, One-Trader-One-ID coding policy, position limits, and large trader reporting. In addition, given the different risk profile of overseas traders and the new trading framework of crude oil futures, INE has adopted robust Know Your Customer procedures, including the trader's identity authentication system, ownership & control reporting, and strengthen the management of customer fund segregation and the closed circuit cash flow of margin fund. INE will also work with overseas futures regulators to establish joint regulatory mechanisms to develop effective cross-border supervision and to enable investigation of suspicious trading activity.

## 64 What common China futures rule principles will be carried over to the crude oil futures market? What new rules will be formulated and applied?

China's crude oil futures market carries over certain practices common to China's other futures markets, such as, the One-Trader-One-ID coding policy, margining, position limit, physical delivery, and the risk management framework.

For overseas futures brokers and investors, there are also specific laws and rules in place in relation to their eligibility criteria, use of foreign currencies, and risk management.

# 65 What are the Chinese crude oil futures contract specifications?

The specifications for Chinese crude oil futures contract are as follows:

Table 4: Specifications of China's Crude Oil Futures contract

| | |
|---|---|
| Product | Medium Sour Crude Oil |
| Contract Size | 1,000 barrels per lot |
| Price Quotation | Yuan (RMB) per barrel (exclusive of taxes and customs duty) |
| Minimum Price Fluctuation | 0.1 yuan/barrel |
| Daily Price Limits | ±4% from the settlement price of the previous trading day |
| Listed Contracts | Monthly contracts of 12 consecutive months followed by eight (8) quarterly contracts |
| Trading Hours | 9:00-11:30 a.m., 1:30-3:00 p.m. Beijing Time, and other trading hours as prescribed by INE |
| Last Trading Day | The last trading day of the month before the delivery month, subject to change by INE in view of China national holidays |
| Delivery Period | 5 consecutive trading days after the last trading day |
| Grades and Quality Specifications | Medium sour crude oil with API gravity of 32° and sulfur content of 1.5% by weight. Deliverable grades and the price differentials are stipulated by INE |
| Delivery Venues | Delivery Storage Facilities designated by INE |
| Minimum Trading Margin | 5% of contract value |
| Settlement Type | Physical delivery |
| Product Code | SC |
| Listing Exchange | Shanghai International Energy Exchange |

Source: Shanghai International Energy Exchange

## 66 Why has INE chosen medium sour crude oil as the underlying for its crude futures?

The medium sour crude oil has been chosen for the following reasons: (1) reserves of this type of petroleum is relatively abundant and accounts for about 45% of global oil production; (2) Due to geographical di erences in production and consumption of medium sour crude compared with light sweet crude, their respective market supply and demand dynamics also di er. Currently there is still not a global benchmark market price for medium sour crude; and (3) It is the primary crude stream imported by China and its neighboring countries. The creation of a benchmark for medium sour crude oil may bene t and enhance oil trade in Asia-Pacific (Appendix 7).

## 67 How does INE set the deliverable grades, crude quality criteria and price differentials for each deliverable grade of crude futures?

Based on relevant rules prescribed in the contract specifications for the "*Standard Crude Oil Futures Contract of the Shanghai International Energy Exchange*" and the "*Standard Crude Oil Futures Contract of the Shanghai International Energy Exchange*", the deliverable grades, crude quality criteria and price differentials for each deliverable grade of crude futures are set as follows:

Table 5: INE Crude Futures' Deliverable Grades, Crude Quality Criteria & Price Differentials

| Nation | Deliverable Crudes | API Gravity | Sulfur (%) | Price Differential (Yuan / Barrel) |
|---|---|---|---|---|
| United Arab Emirates | Dubai | ≥30 | ≤2.8 | 0 |
| | Upper Zakum | ≥33 | ≤2.0 | 0 |
| | Murban | ≥35 | ≤1.5 | 5 |
| Sultanate of Oman | Oman | ≥30 | ≤1.6 | 0 |
| State of Qatar | Qatar Marine | ≥31 | ≤2.2 | 0 |
| Republic of Iraq | Basrah Light | ≥29 | ≤3.5 | -5 |
| | Basrah Medium | ≥26 | ≤4.0 | -10 |
| Federative Republic of Brazil | Tupi | ≥28 | ≤0.8 | 10 |
| People's Republic of China | Shengli | ≥24 | ≤1.0 | -5 |

Note:
1 API Gravity = (141.5/SG at 60 °F )-131.5. Gravity as determined by ASTM D1298 or its latest revision.
2 Sulfur as determined by ASTM D4294 or its latest revision.
3 Existing Basrah Light standard warrants at 28 ≤ API < 29 can still be used for delivery.

INE closely monitors key changes and market developments for each deliverable grade, and will adjust Deliverable Grades, Crude Quality Criteria & Price Differentials accordingly.

## 68 Why wasn't domestically produced crude chosen as the deliverable grade for Chinese crude futures contract?

Because domestically produced crude oil is consumed on-site and/ or refined by nearby oil company that also owns the oil field, China does not currently have a crude oil spot market. Instead, the country mostly relies on imported oil. In view of how crude oil is produced and sold in China and in the interest of market stability, INE recognizes both imported and domestically produced crude as deliverables.

## 69 What contract months are listed for trading for China's crude futures? How is it different from other international markets?

The INE lists 12 consecutive monthly followed by 8 quarterly crude futures contracts, spanning a period of three years. In comparison, time length of contract months of overseas oil futures contracts generally is much longer. For example, 96 consecutive monthly contracts of Brent Crude futures are listed on ICE. For CME WTI futures, monthly contracts are listed for the current year and the next 10 calendar years and 2 additional contract months; and a new calendar year and 2 additional contract months will be added following the termination of trading in the December contract of the current year. For GME Oman futures, consecutive months are listed for the current year and the next five years and a new calendar year will be added following the termination of trading in the December contract of the current year.

Considering the fact of the illiquidity of far-month contracts in China's futures market, the time-length of contract months of the crude oil futures is set at 3-year long in the beginning phase. It will be adjusted by INE going forward in response to market developments and investors' needs.

| Exchange / Contract | Contract Months |
|---|---|
| CME WTI | Monthly contracts are listed for the current year and the next 10 calendar years and 2 additional consecutive contract months. A new calendar year and 2 additional contract months will be added following the termination of trading in the December contract of the current year. |
| ICE BRENT | Up to 96 consecutive months |
| GME OMAN | Consecutive months are listed for the current year and the next five years. A new calendar year will be added following the termination of trading in the December contract of the current year |
| INE SC | 12 consecutive near-term monthly followed by 8 quarterly of crude futures contracts |

# 70 What is the last trading day and delivery period of China's crude oil futures contract? How do they differ from those of overseas contracts?

The last trading day for China's crude oil futures contract is the last trading day of the month preceding the delivery month. For example, the last trading day for the Jun-2020 contract is May 29th, 2020. The delivery period (delivery of crude warrants) is the five consecutive trading days after the last trading day.

Trading in the current delivery month of NYMEX WTI contract ceases on the third business day prior to the twenty-fifth calendar day of the month preceding the delivery month. If the twenty-fifth calendar day of the month is a non-business day, trading ceases on the fourth business day prior to the last business day preceding the twenty-fifth calendar day. For example, the last trading day for the Jun-2020 contract (delivery month) is May 20th, 2020. The NYMEX WTI contract calls for physical delivery; the delivery period is from the first business day to the last business day of the delivery month.

The last trading day for the ICE Brent contract is the last business day of the second month preceding the contract month. For example, the last trading day of the Jun-2020 contract is April 30th, 2020. The ICE Brent contract is cash settled against the ICE Brent Index Price, a well-developed spot market price which provides an authoritative price for the final settlement of the futures contract.

The last trading day for the GME Oman contract is the last trading day of the second month preceding the delivery month. For example, the last trading day for the Jun-2020 contract is April 30, 2020. The GME Oman contract calls for physical delivery defined in the following way: Intention notices for delivery and matching are completed on the first business day after the last trading day, and delivery shall be completed within the delivery month.

| Exchange / Contract | Last Trading Day |
|---|---|
| CME WTI | Trading in the current delivery month terminates 3 business day prior to the 25th calendar day of the month prior to the contract month. If the 25th calendar day is not a business day, trading terminates 4 business days prior to the 25th calendar day of the month prior to the contract month. |
| ICE BRENT | The last trading day is the last business day of the second month preceding the contract month. |
| GME OMAN | The last trading day is the last day of trading in the second month preceding the delivery month. |
| INE SC | The last trading day is the last trading day of the month preceding the delivery month, subject to change by INE taking into account of China national holidays. |

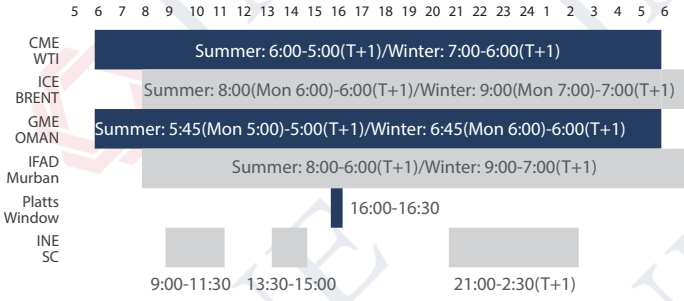
# 71 How do the daily trading hours of China's crude oil futures contracts differ from those of major international crude oil futures contracts?

CME WTI on Globex: Sunday to Friday 18:00–17:00 (+1 day) New York Time/ET, with a 60-minute break each day beginning at 17:00 ET.

ICE Brent New York Time 20:00–18:00 (+1 day); London Time: 01:00–23:00; Singapore Time: 08:00–06:00 (+1 day) Sunday Open London: 22:00.

GME Oman: Electronic trading is open from 16:00 CST/CDT Sundays and from 16:45 CST/CDT Monday to Thursday and closes at 16:00 CST/CDT the next day, Monday to Friday.

INE Crude Oil Futures: Monday to Friday 9:00–11:30, 13:30–15:00 Beijing Time and other trading hours (Continuous Trading Hours) as prescribed by the INE. INE will continue to observe the needs for extension of trading hours for the market development.




Note:
1.All hours shown above are based on Beijing time.
2.CDT refers Central Daylight Time. The time di erence is reduced by one hour when CDT is in e ect.

# 72 Is there any crude spot price that serves as the underlying price for China's crude oil futures contract?

Chinese crude oil futures facilitate physical delivery through crude stored in designated bonded oil depots, which are located in the coastal regions of China. Thus the China's crude oil futures price should reflect the CIF (i.e. cost, insurance and freight) China bonded port's spot oil price.

For sellers intended to make delivery, the delivery price is the CIF price (from the origination) at bonded oil depots; and for buyers intending to take delivery, it is the FOB price (for the next shipping destination) at bonded oil depots. Take Oman crude as an example, the FOB price of Oman crude at the port of loading plus the applicable freight, insurance fee and other expenses for shipment to a Chinese port, and the applicable fees of port, dock and load-in after arrival at the Chinese port shall equal to the theoretical delivery price of Oman crude at a Chinese port.

# 73 How is the monthly average settlement price (MASP) for the Shanghai crude oil futures calculated?

The monthly average settlement price (MASP) for the Shanghai crude oil futures is calculated as follows:

1. MASP for an SC calendar month contract =

$$\frac{\sum \text{Daily settlement price}}{\text{Number of days traded in the current calendar month}}$$

2. MASP for an SC active month contract =

$$\frac{\sum [A+B]}{\text{Number of days traded in the current calendar month}}$$

Where,

A = Daily settlement price of the nearest month contract (for the period from the first trading day to the thirteenth-to-last trading day of the nearest month contract in the current month);

B = Daily settlement price of the next-nearest month contract (for the period from the twelfth-to-last trading day of the nearest month contract to the last trading day of the next-nearest month contract in the current month).

**Example 1 of MASP for an SC active month contract** (the last trading day of the nearest month contract and of the next-nearest contract fall on the same day):

Table 6: Settlement Prices of SC2112 and SC2201 in November 2021

| Trading days | Date | Settlement price of SC2112 (nearest month contract) | Settlement price of SC2201 (next-nearest month contract) |
|---|---|---|---|
| 1 | 2021/11/1 | 521 | 519.6 |
| 2 | 2021/11/2 | 531.3 | 530.1 |
| 3 | 2021/11/3 | 526.8 | 523.9 |
| 4 | 2021/11/4 | 513.6 | 511.5 |
| 5 | 2021/11/5 | 516 | 512.8 |
| 6 | 2021/11/8 | 522.2 | 517.7 |
| 7 | 2021/11/9 | 526.3 | 521.5 |

| Trading days | Date | Settlement price of SC2112 (nearest month contract) | Settlement price of SC2201 (next-nearest month contract) |
|---|---|---|---|
| 8 | 2021/11/10 | 530.7 | 527.7 |
| 9 | 2021/11/11 | 526.7 | 522.1 |
| 10 | 2021/11/12 | 517.7 | 514.3 |
| 11 | 2021/11/15 | 513.3 | 509 |
| 12 | 2021/11/16 | 510.8 | 508.5 |
| 13 | 2021/11/17 | 514.8 | 511.8 |
| 14 | 2021/11/18 | 511.8 | 500.1 |
| 15 | 2021/11/19 | 513.5 | 499.9 |
| 16 | 2021/11/22 | 500.1 | 489.4 |
| 17 | 2021/11/23 | 504.5 | 491.2 |
| 18 | 2021/11/24 | 518.9 | 506.7 |
| 19 | 2021/11/25 | 524.9 | 511.4 |
| 20 | 2021/11/26 | 498.6 | 504.5 |
| 21 | 2021/11/29 | 491.1 | 474.5 |
| 22 | 2021/11/30 | 457.2 | 465.9 |

In November 2021, SC2112 and SC2201 were respectively the nearest month contract and the next-nearest month contract on crude oil futures. For both SC2112 and SC2201, their last trading day in November was November 30, and both saw 22 days of trading.

Therefore, the MASP of the SC active month contract for November is the quotient of the sum of two components divided by the number of trading days in the month (22), where the first component is the sum of the settlement prices of SC2112 for the period from the first trading day to the thirteenth-to-last trading day of SC2112 (i.e., November 12), and the second component is the sum of the settlement prices of SC2201 for the period from the twelfth-to-last trading day of SC2112 to the last trading day of SC2201. In formula:

$$\text{MASP of the SC active month contract for November 2021} = \frac{\sum[SC2112(521+531.3+526.8...+517.7)+SC2201(509+508.5+511.8...+465.9)]}{22\text{days}}$$

$$= \frac{5232.3+5972.9}{22\text{days}}$$

$$= 509.3\text{yuan/barrel}$$

**Example 2 for the MASP of the SC active month contract** (the last trading day of the nearest month contract and of the next-nearest contract fall on different days):

In January 2022, SC2202 and SC2203 were respectively the nearest month contract and the next-nearest month contract on the crude oil futures. The last trading day of SC2202 was moved forward to January 21 due to the Chinese New Year, giving 14 trading days for the month of January. The last trading day of SC2203 was January 28, allowing the contract to be traded for 19 days in the month.

Therefore, the settlement prices of SC2202 for the period from January 1 to 5 (the thirteenth-to-last trading day of SC2202) and the settlement prices of SC2203 for the period from January 6 to 28 are used to calculate the MASP of the SC active month contract in January.

Table 7: Settlement Prices of SC2202 and SC2203 in January 2022

| Trading days | Date | Settlement price of SC2202 (nearest month contract) | Settlement price of SC2203 (next-nearest month contract) |
|---|---|---|---|
| 1 | 2022/1/4 | 494.1 | 492 |
| 2 | 2022/1/5 | 500.9 | 498.6 |
| 3 | 2022/1/6 | 504.9 | 501.8 |
| 4 | 2022/1/7 | 515.7 | 514.1 |
| 5 | 2022/1/10 | 511.6 | 510 |
| 6 | 2022/1/11 | 509.1 | 506 |
| 7 | 2022/1/12 | 515.1 | 514.7 |
| 8 | 2022/1/13 | 525 | 523.8 |
| 9 | 2022/1/14 | 533.4 | 525.1 |
| 10 | 2022/1/17 | 542.1 | 530.4 |
| 11 | 2022/1/18 | 542.3 | 536.3 |
| 12 | 2022/1/19 | 545.3 | 544.7 |
| 13 | 2022/1/20 | 539.4 | 546.4 |
| 14 | 2022/1/21 | 533.7 | 540 |
| 15 | 2022/1/24 | 540.5 | 537.5 |
| 16 | 2022/1/25 | 529.9 | 527.7 |
| 17 | 2022/1/26 | 533.6 | 531.2 |
| 18 | 2022/1/27 | 545.6 | 542.5 |
| 19 | 2022/1/28 | 542.4 | 542.2 |

$$\text{MASP of the SC active month contract for January 2022} = \frac{\sum[SC2202(494.1+500.9)+SC2203(501.8+514.1...+542.2)]}{19\text{days}}$$

$$= \frac{995+8974.4}{19\text{days}}$$

$$= 524.7\text{yuan/barrel}$$

## 74 How does China's crude oil futures differ from and relate to other major international contracts?

China's crude oil futures differ from major international crude oil futures in a number of areas, including deliverable grades, quotation method, trading hours, and listed contract months. A summary of comparison is given in the table below:

## Table 8: Comparison of China's and Other International Crude Oil Futures Contracts

| | INE (SC) | ICE Brent (B) | CME WTI (CL) | GME Oman (OQD) | ICE Futures Abu Dhabi Murban (ADM) |
|---|---|---|---|---|---|
| Underlying Product | Medium sour crude oil with API gravity of 32 and sulfur content of 1.5% by weight. Deliverable grades and premiums / discounts will be separately set by INE | BFOET (Brent, Forties, Oseberg, Ekofisk, Troll) | WTI / DSW [4] | Oman crude oil | Murban crude oil |
| Contract Size | 1,000 barrels | 1,000 barrels | 1,000 barrels | 1,000 barrels | 1,000 barrels |
| Price Quotation | Yuan per barrel | U.S. Dollar and Cents per barrel | U.S. Dollar and Cents per barrel | U.S. Dollar and Cents per barrel | U.S. Dollar and Cents per barrel |
| Minimum Price Fluctuation | ¥0.1 per barrel | $0.01 per barrel | $0.01 per barrel | $0.01 per barrel | $0.01 per barrel |
| Settlement Method | Physical delivery | EFP delivery with an option to cash settle | Physical delivery | Physical delivery | Physical delivery |
| Delivery Method / Type | Delivery at INE-designated delivery storage facilities in bonded zones | EFP delivery with an option to cash settle | FOB at pipeline or delivery at depot | FOB at the loading port | FOB at the loading port |
| Settlement Price | The daily volume-weighted average price (VWAP) | VWAP from 19:28 to 19:30 London time | VWAP from 14:28 to 14:30 Eastern time (US) | Released daily at 13:30 CST/CDT at the same time as that of the NYMEX light sweet crude oil futures [5] | VWAP from 19:28 to 19:30 London time |
| Last Trading Day | The last trading day of the month preceding the contract month | The last business day of the second month preceding the contract month | 3 business day prior to the 25th calendar day of the month prior to the contract month. If the 25th calendar day is not a business day, trading terminates 4 business days prior to the 25th calendar day of the month prior to the contract month | The last trading day of the second month preceding the delivery month | Trading ceases at 16:30 Singapore time on the last trading day of the second month preceding the delivery month. If that day is the trading day preceding New Year's Day, then trading ceases on the next preceding trading day |
| Delivery Period | Five consecutive business days after the last trading day [6] | Generally cash-settled through EFP before expiry | From the first calendar day to the last calendar day of the delivery month | Delivery matching and tanker selection in the month preceding the contract month; delivery in contract month | The first Terminal Loading Day of the delivery month to the third Terminal Loading Day prior to the end of the said delivery month |

[4] WTI/DSW shall meet the grade and quality specifications on sulfur, API, viscosity, RVP, basic sediment, pour point, carbon residue, total acid number (TAN), nickel, vanadium and HTSD.

[5] https://www.gulfmerc.com/gme-product-services/gme-trading-settlements. The daily settlement prices is determined based on the GME Oman market relevant values between 02:25 and 02:30 EST, and may be corrected or amended to ensure it is a fair reflection of the market.

[6] Because China's crude oil futures are delivered through standard warrants, "five consecutive business days after the last trading day" refers to the period for the transfer of warrants, while the actual loading of goods (either onto a vessel or into a storage facility) would have been completed before then.

| | INE (SC) | ICE Brent (B) | CME WTI (CL) | GME Oman (OQD) | ICE Futures Abu Dhabi Murban (ADM) |
|---|---|---|---|---|---|
| Price Limits | Within ±4% from the settlement price of the previous day | Interval price limits (IPL) functionality acts as a temporary circuit breaker feature on the electronic platform, to diminish the likelihood and extent of short-term price spikes or aberrant market moves. While designed to be in force throughout each trading day, it is expected the protections will be triggered only in the case of extreme price moves over very short periods of time | A circuit breaker that triggers a 2-minute trading halt upon touching a specific price range. Price limit is removed after the fourth triggering on a trading day | Circuit breakers only | Interval price limits (IPL) functionality acts as a temporary circuit breaker feature on the electronic platform, to diminish the likelihood and extent of short-term price spikes or aberrant market moves. While designed to be in force throughout each trading day, it is expected the protections will be triggered only in the case of extreme price moves over very short periods of time |
| Minimum Trading Margin | 5% of contract value | Maintenance margin: $1,497-4,710/lot, progressively lower for the longer-dated contracts [7] | Maintenance margin: $2,416-5,830/lot, progressively lower for the longer-dated contracts [8] | Maintenance margin: $3,544-4,755/lot, progressively lower for the longer-dated contracts [9] | Maintenance margin: $1,956.4–5,100/lot, progressively lower for the longer-dated contracts [10] |
| Contract Months | Monthly contracts of recent 12 consecutive months followed by 8 quarterly contracts | 96 consecutive months | Monthly contracts listed for the current year and the next 10 calendar years and 2 additional contract months. List monthly contracts for a new calendar year and 2 additional contract months following the termination of trading in the December contract of the current year | Consecutive months are listed for the current year and the next 5 years. A new calendar year will be added following the termination of trading in the December contract of the current year | 48 consecutive months |
| Trading Hours | 9:00-11:30, 13:30-15:00 Beijing Time and other hours specified by INE. Continuous trading hours are 21:00-2:30 (+1 day) | New York Time: 20:00-18:00 (+1day)<br>London Time: 1:00-23:00<br>Singapore Time: 08:00-06:00 (+1day)<br>Sunday Open London: 22:00 | CME Globex: 18:00-17:00 New York Time (Eastern Time) Sunday to Friday with a 60-minute break each day beginning at 17:00 | Electronic trading is open from 16:00 CST/CDT Sundays and from 16:45 CST/CDT Monday to Thursday and closes at 16:00 CST/CDT the next day, Monday to Friday | New York Time: 20:00-18:00 (+1 day)<br>London Time: 00:00-22:00<br>Singapore Time: 08:00–06:00 (+1 day)<br>Abu Dhabi 4:00-2:00(+1day) |

Source: INE, CME, ICE, GME, as of 2025

[7] Margin data as of February 27, 2025. Subject to change by the exchange. See https://www.theice.com/products/219/Brent-Crude-Futures/margin-rates for details.
[8] Margin data as of February 27, 2025. Subject to change by the exchange. See https://www.cmegroup.com/markets/energy/crude-oil/light-sweet-crude.margins.html#pageNumber=10 for details.
[9] Margin data as of February 27, 2025. Subject to change by the exchange. See https://www.cmegroup.com/solutions/risk-management/margin-services/product-margins.html?redirect=/clearing/margins/inters.html#pageNumber=5&exchange=NYM&sector=DME&span=span2&clearingCode=all for details.
[10] Margin data as of February 27, 2025. Subject to change by the exchange. See https://www.ice.com/products/75443578/Murban-Crude-Oil-Futures/margin-rates for details.

# TRADING ACCESS TO CHINA'S CRUDE OIL FUTURES

# 09

# TRADING ACCESS TO CHINA'S CRUDE OIL FUTURES

## 75 Why does the China crude oil futures market need global participation?

First, crude oil is freely traded by a wide variety of global participants on a multilateral basis. An internationalized crude oil futures market in China may more accurately reflect the spot market, thereby better support the real economy.

Second, China is a net oil importer, with imports exceeding 70% of its total consumption. Globalizing the futures market and allowing international participation helps re-balance the relative power of oil buyers and sellers, resulting in a more robust market mechanism.

Third, with the participation of international investors, the crude oil futures market may help China to gain a voice in the international crude oil market.

## 76 What are the major oil spot and derivative trading hubs globally?

Most international oil spot trading takes place in the region of North Sea and the Mediterranean Sea in Europe, the United States, Singapore, and the Middle East. Meanwhile, Europe, the United States, and the Asian Pacific are the dominant oil-consuming regions in the world. The global top three crude oil futures are West Texas Intermediate (WTI) futures traded on the New York Mercantile Exchange (NYMEX), a subsidiary of the Chicago Mercantile Exchange Group (CME Group), Brent crude futures traded on the London-based Intercontinental Exchange (ICE), and Shanghai crude oil futures trade on INE, a subsidiary of Shanghai Futures Exchange (SHFE).

## 77 Is the rule of "one trader one ID" applicable to different teams within the same institution, so as to provide a differentiated solution for transaction management between different sub-accounts of the institution?

At present, IT system vendors provide omnibus account and sub-accounts separation services in the global market. At the exchange level, one account one ID is a rule for establishing trading codes for only one individual or one institutional investor. If the institutional client has the demand for sub-accounts, it shall negotiate with the relevant IT system vendor.

## 78 How can overseas participants access and trade China's crude oil futures?

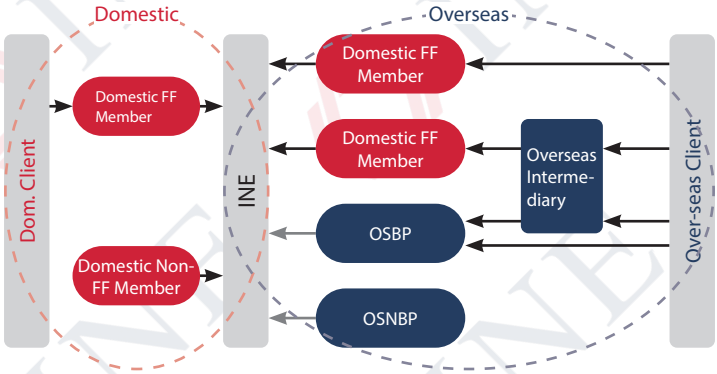
Overseas clients can access the Shanghai crude oil market as a Qualified Foreign Investor (QFI) or through one of the four accesses generally available to Specified Domestic Products (such as INE's crude oil futures):

**Access 1:** Global customers may trade through a domestic Futures Firm Member (FF Member) of INE;

**Access 2:** An INE-recognized Overseas Intermediary can help its global customers execute and clear trades through a carrying broker, either a domestic FF Member or an Overseas Special Brokerage Participant (OSBP) of INE, following the principle of "One Trader, One ID" regime;

**Access 3:** An INE OSBP having direct trading access to INE can help its global customers execute trades on INE, but clearing and settlement must be handled by its carrying broker, who must be an INE's FF Member;

**Access 4:** A global customer can also trade directly at INE as an Overseas Special Non-Brokerage Participant (OSNBP), but clearing and settlement must be handled by its carrying broker, who must be an INE's FF Member.




Note: Black arrows indicate direct access of trading, clearing and settlement. Grey arrows indicate direct access of trading directly, but clear and settle trades through a carry broker who must be a domestic FF Member.

Exhibit 10: Accesses of Participation of Overseas Investors
Source: Shanghai International Energy Exchange

## 79 What is the trader eligibility criteria for overseas institutional customers to participate in China's crude oil futures market and how may eligible overseas traders trade on the Exchange?

Any overseas institutional investor intending to participate in China's crude oil futures market should meet the requirements set in the Futures Trading Participant Eligibility Management Rules of the Shanghai International Energy Exchange, including but not limited to the following: having relevant business professionals who understand the essentials of futures trading and the rules of INE and have passed relevant tests; having futures trading history and record; having a cash balance of no less than RMB 1 million or its foreign currency equivalent in its margin account for five continuous trading days before applying for a trading code; having in place sound futures trading management rules; having no material adverse credit record and not banned from the futures

market by competent regulatory authorities; having never been prohibited or banned from engaging in trading futures pursuant to any laws, rules and regulation of China or rules of INE.

All Eligible traders need to abide by the laws and regulations of China, the rules of INE, as well as the laws, regulations, and regulatory rules of their home jurisdiction. INE encourages investors and oil-related commercial clients to engage in hedging trades in China's crude oil futures market.

Overseas investors may participate in China's crude oil futures market using any of following access channels: (a) Global customer may trade through a domestic Futures Firm Member (FF Member); (b) An INE-recognized Overseas Intermediaries may help its global customers execute and clear trades through a carry broker, either a domestic FF Member or an Overseas Special Brokerage Participant (OSBP); (c) An INE OSBP having direct trading right on the Exchange may help their global customers execute trades on the Exchange; or (d) an Overseas Special Non-Brokerage Participants (OSNBP) of INE that trades directly on the Exchange.

## 80 How may overseas futures brokers participate in China's crude oil futures market?

An overseas futures broker may either apply to the INE to be an OSBP and direct connect to the Exchange for execution of trades or execute trades and clear through a carry broker who is either a domestic FF Member or an OSBP on behalf of its overseas customers.

## 81 How may overseas individual investors participate in China's crude oil futures market?

Any overseas individual investor intending to participate in China's crude oil futures market should meet the requirements set in the Futures Trading Participant Eligibility Management Rules of the Shanghai International Energy Exchange, including but not limited to the following: having full capacity for civil conduct; understanding the essentials of futures trading and the rules of INE; having passed relevant tests; having futures trading history and record; having a cash balance of no less than RMB 500,000 or its foreign currency equivalent in his/her margin account for five continuous trading days before applying for a trading code; having no material adverse credit records and not banned from the futures market by competent regulatory authorities; having never been prohibited or banned from engaging in futures trading pursuant to any laws, regulations, and rules of China or any rules of INE.

All Eligible traders need to abide by the laws and regulations of China, the rules of INE, as well as the laws, regulations, and regulatory rules of their home jurisdiction.

An overseas individual investor may participate in China's crude oil futures market through a domestic FF Member, an OSBP, or an Overseas Intermediary.

## 82 Do overseas individual investors have to open NRA accounts to trade crude oil futures?

Overseas individual investors can trade INE crude oil futures in two ways: (1) through a Chinese futures firm; or (2) through an OSBP.

The former requires the individual investor to open a dedicated futures settlement account-either an "overseas individual RMB bank settlement account" or an "overseas individual domestic foreign exchange account"-at a designated depository bank in China, pursuant to Announcement [2015] No. 19 of the People's Bank of China and Circular Huifa [2015] No. 35 of the State Administration of Foreign Exchange.

A Chinese bank account is not required in the second method.

## 83 Is there any trader eligibility requirement for domestic institutional investors in participating in China's crude oil futures market?

Any domestic institutional investor intending to participate in China's crude oil futures market should meet the requirements set in the Futures Trading Participant Eligibility Management Rules of the Shanghai International Energy Exchange, including but not limited to the following: having relevant business professionals who understand the essentials of futures trading and the rules of INE and have passed relevant tests; having futures trading history and record; having a cash balance of no less than RMB 1 million or its foreign currency equivalent in its margin account last for more than five business days before applying for a trading code; having in place sound futures trading management rules; having

no material adverse credit record and not banned from the futures market by the relevant regulatory authority; having never been prohibited or banned from engaging in trading futures pursuant to any laws, rules and regulation of China or rules of INE. INE encourages investors and oil-related commercial clients to engage in hedging trades in the crude oil futures market.

## 84 How do domestic individual investors participate in China's crude oil futures market? What are the restrictions?

Any domestic individual investor intending to participate in China's crude oil futures market should meet the requirements under the Futures Trading Participant Eligibility Management Rules of the Shanghai International Energy Exchange, including but not limited to the following: having full capacity for civil conduct; understanding the essentials of futures trading and the rules of INE; having passed relevant tests; futures trading history and record; having a cash balance of no less than RMB 500,000 or its foreign currency equivalent in his/her margin account for five continuous trading days before applying for a trading code; having no material adverse credit records and not banned from the futures market by competent regulatory authorities; having never been prohibited or banned from engaging in futures trading pursuant to any laws, regulations, and any rules of INE.

All Eligible traders need to abide by the laws and regulations of China, the rules of INE, as well as. In addition, clients not able to accept or issue the tax invoices required by INE are not allowed to engage in physical delivery of the crude oil futures.

## 85 Is it required for those investors, who are under the jurisdiction of Europe and participating in China's crude oil futures market through a European Overseas Intermediary, to register to relevant authority for participation of overseas futures market by observing the European Market Infrastructure Regulation (EMIR)?

Currently, INE has completed the registration of Hong Kong ATS and Singapore RMO. According to the guidance of the CSRC, the list of countries where accounts can be opened will be explored and continuously updated.

There are many countries and financial regulators in the region of Europe or under the league of European Union (EU). Thus an European participant may face double layers of regulation from its jurisdiction as well as from the European Securities and Markets Authority (ESMA) when participating the China crude futures trading, It's highly recommended to such participant to provide information about his/her nationality and desired participation mode on INE, so that the Exchange may conduct relative regulation study and provide advice accordingly.

## 86 Can a Non-FF Member that is approved by INE to use other futures broker(s) to execute their trades on INE?

According to Article 37 of "*Membership Management Rules of the Shanghai International Energy Exchange*," that states "except otherwise approved by the Exchange, a Non-FF Member shall not open another account as a Client to engage in futures trading," A trader, that has already gained the status of being an INE's non-FF member and directly trades and clears on the Exchange, shall not trade through a broker using a client account.

## 87 Public Offering Funds design various products such as ETF, which could increase the liquidity of futures contracts. Can Public Offering Funds participate in crude oil futures trading?

For domestic investors, the public offering fund has been categorized as special legal client and can open crude oil trading accounts. Currently, there are several fund products have participated in crude oil trading. In addition to this, INE also has overseas clients who open trading account already.

## 88 Does INE accept English version of documents and files? Are regulations, articles, circulars and notices published by INE also available in English?

INE accepts feedback in English on drafting and revising business related rules. In terms of the application documents for account opening regarding overseas intermediaries and overseas special participants, INE accepts the application documents with both Chinese and English version. According to article 41 of the Overseas Special Participant Management Rules, "All written materials submitted by overseas special participants to INE shall be in Chinese, and the Chinese version shall prevail.". Meanwhile, INE provides bilingual versions of laws, regulations, notices and circulars in both Chinese and English, but as legal texts, the Chinese version shall prevail.

## 89 Since it's difficult to obtain clients' overseas credit reports, besides the commitment letter, what are the other ways?

Futures firms shall conduct clients' due diligence (KYC) when develop overseas business, and should not be limited to the clients' commitment letter. Besides, FCMs can work with credit checking company in conducting background check, asking credit rating agencies to issue opinions, conducting verification on company's registered representatives, or accepting notarization and other forms of verification based on clients' situation.

## 90 For overseas investors, what are the available trading vendors that have been connected to the INE trading platform?

Overseas trading platforms including CQG, PATs, Bloomberg, Tradex, Esunny, and TT are now connected to the INE market. In terms of the settlement system, FIS has completed both trading and settlement connection with CTP. In addition to this, INE will continue to cooperate with major international system vendors to facilitate their access.

# 10

# SETTLEMENT AND RISK MANAGEMENT OF CHINA'S CRUDE OIL FUTURES TRADING

# SETTLEMENT AND RISK MANAGEMENT OF CHINA'S CRUDE OIL FUTURES TRADING

## 91 How are the daily settlement price and final settlement price of China's crude oil futures contract determined? How are settlement prices of major international crude oil futures contracts determined?

The daily settlement price of INE's crude futures is a volume-weighted average price of all trades executed in a trading day and the final settlement price is the arithmetic mean of the daily settlement prices of the last five trading days that have trades executed.

The daily settlement price of ICE Brent crude oil futures is the volume-weighted average price from 19:28 to 19:30 London Time, while that of WTI crude oil futures is the volume-weighted average price from 14:28 to 14:30 New York Time, i.e., from 19:28 to 19:30 London Time, the same window of data collection as ICE. The daily settlement price of GME Oman crude oil futures is determined by the revelent prices at the GME Oman market between 2:25 a.m. and 2:30 a.m. U.S. Eastern Standard Time, and may be corrected or amended to ensure it is a fair reflection of the market.

The delivery mechanism of Brent crude oil futures contracts includes employing Exchange of Futures for Physicals (EFP) and cash settlement based on the ICE Brent Index price. With EFP, the final settlement price is not declared to the market. The cash settlement price for the ICE Brent Future is based on the ICE Brent Index on expiry day for the relevant ICE Brent Futures contract month. The Index represents the average price of trading in the BFOET (Brent-Forties-Oseberg-Ekofisk-Troll) cash or forward market for the relevant delivery month. Only block trades (600,000 barrels or more) declared to the market and verified by the exchange are included in the calculation. The ICE Brent Index is the simple average of the five constituent values.[10]

## 92 What's the requirement on money exchange offshore participants in the crude futures trading?

The crude futures on INE is denominated in Renminbi (RMB) and it's cleared and settled in RMB as well. Overseas investors and qualified overseas brokers can also post USD as margin.

Any purchase and sales of foreign exchange shall match the crude futures' trading result of an offshore traders or a qualified overseas brokers. The money exchange can only be executed for mark to market for crude futures trading, futures trading related fees, physical delivery, and other money exchange needs related to cruder futures trading.

[10] The detailed calculation method can be found at: https://www.theice.com/publicdocs/futures/ICE_Futures_Europe_Brent_Index.pdf

## 93 What's the flow of inbound/outbound fund transfer for crude oil futures trading?

According to the Announcement [2015] No. 19 of People Bank of China and Circular Huifa [2015] No. 35 and the Policy Q&A of the State Administration of Foreign Exchange (SAFE), offshore investors and overseas brokers may remit offshore RMB or USD to onshore specific-purpose bank account to participate the crude futures trading. Such funds shall be placed in segregated accounts and isolated from unauthorized access and operations while they are within China, and may not be used for any purpose other than futures trading. Remittance of fund in a specific-purpose bank account shall observe the scope of receipts and payments as prescribed in relevant policies.

## 94 How does China's crude oil future contract differ from other major crude oil futures contracts in the world in terms of the price limit?

A price limit of 4% (minimum limit) above or below the preceding day's settlement price. The Exchange may, in its sole discretion, adjust the price limit for such futures contract in response to market risk conditions. In general, international markets do not prescribe a price limit but most have established circuit breakers.

The ICE Brent adopts interval price limits functionality serving as circuit breaker to reduce short-term price fluctuations. Although it is effective on every trading day, it can be only triggered in a very short time under extreme price fluctuations. The WTI crude futures introduces Dynamic Price Limit Functionality: i.e. the upper

and lower price fluctuation limit will be calculated by utilizing the dynamic variant in continuously rolling 60-minute look-back period. When the price exceeds the dynamic price fluctuation limits, then a two minutes trading halt will commence. After the fourth triggering event on a trading day, there shall be no further special price fluctuation limits.

| Exchange / Contract | Price Limit |
|---|---|
| CME WTI | Introduce Dynamic Price Limit Functionality: The upper and lower price fluctuation limit will be calculated by utilizing the dynamic variant in continuously rolling 60-minute look-back period. When the price exceeds the dynamic price fluctuation limits, then a two minutes trading halt will commence. After the fourth triggering event on a trading day, there shall be no further special price fluctuation limits. |
| ICE BRENT | Interval price limits functionality, serving as circuit breaker to reduce short-term price fluctuations. Although effective on every trading day, it can be only triggered in a very short time under extreme price fluctuations. |
| GME OMAN | Circuit breakers only |
| INE SC | 4% above or below the previous day's settlement price |

## 95 What is the margining methodology for the China's crude oil futures market? How is it different from that for major crude oil futures in the world?

INE applies pre-margining. The Exchange applies different rates of trading margin for a futures contract based on different periods of trading from its listing to its last trading day. The Exchange may, in its sole discretion, adjust the price limit for a futures contract in response to market risk conditions and it shall issue a public announcement of the adjustment. The management of Clearing Deposit shall be managed in accordance with the *Clearing Rules of the Shanghai International Energy Exchange*.

Both the ICE Clear of ICE Europe and the Clearing House of CME Group use CME's proprietary margining system – the Standard Portfolio Analysis of Risk (SPAN) system. The system calculates the initial margin requirement by taking into account the profit and loss under different trading strategies such as calendar spread, crack spread, and arbitrage, as well as the volatility of the different contract months. As a result and which also meets the needs of clearing member's netting settlement procedure, the level of initial margin is minimized to ensure capital efficiency.

## 96 Will trading positions of multiple trading accounts that are owned separately by related entities under same business group be combined together in the Exchange's risk management of large trader reporting or position limit?

INE adopts "one trader, one ID" principle, and issues trading ID code to each futures trader. Long/short positions under the corresponding trading codes of each entity are managed according to the position limits stipulated by regulations. Long/short positions are calculated separately rather than net position. If multiple account holder do not actually have the ownership and controlling relationship, total positions are managed separately. For accounts that have ownership and controlling relationship between each other, the account holders shall declare to INE; if those accounts belong to general clients, the account holders shall declare to China Futures Market Monitoring Center (CFMMC). According to relevant regulation, INE then obtains the actual controlling relationship information of the general clients through CFMMC. Position holding of accounts that have ownership and controlling relationship will be combined in the Exchange's risk management of large trader reporting or position limit.

## 97 What is the procedure in applying the hedging quota and what are INE's principles in evaluating and approving the hedging quota application?

INE implements an approval system for hedging activities. According the Article 38 of its Trading Rules, clients should apply for hedging quota through their account opening institutions and Non-FF Members and OSNBPs should do so directly through INE. In terms of identifying the appropriate amount of hedging quota and principles of evaluating and approving the quota application, INE will take into consideration regarding historical data and future plan of an applicant's actual production, trading, and consumption, as well as spot and futures market conditions. An applicant shall provide information about crude production plan, trading contract/agreement, or oil processing plan.

When a contract enters into "near delivery months (two months prior to the contract expires)" phase, and if the hedging amount of the near delivery months is not approved, then the exchange system will automatically adjust the value of approved hedging quota to that of position limit of near-delivery-month contract, and INE will apply the minimum quota for the adjustment, in order to better manage the market risk. When quota is not enough, hedge trader can re-apply for additional quota.

## 98 The SC position limit of front month contract is 500,000 barrels, while quota for Brent is above 6 million barrels. Can INE increase the position limit for oil companies' and other institutions' convenience?

General clients are required to observe position limits.

Companies that need to hedge their bona fide trades in the spot market may apply to INE for a hedging quota within the corresponding application period, by furnishing the relevant spot trade agreement, production plan, or other documents recognized by INE. Once approved, they may then trade and hedge within that hedging quota, on condition that the risk is kept within a manageable level.

## 99 Is it applicable for letter of credit being used as margin collateral?

According to INE's General Exchange Rules, subject to approval by INE, foreign currencies, standard warrants, Chinese government bonds, and other stable, liquid assets may be used as margin. INE may determine the assets that can be used as margin collaterals at its discretion. At current stage, INE does not accept letter of credit as margin collateral.

## 100 Is it necessary for an FX for the futures trading be conducted in a Designated Depository Bank? Can FX be conducted in one bank that offer better rate and then transferred into the account of the designated depository bank account that such customer has account with?

Money Exchange for futures trading must be conducted in a Designated Depository Bank. When an Exchange Member conducts money exchange, it may check rates offer by different Designated Depository Banks and choose the one with best bid/offer rate to conduct the money exchange.

## 101 For a trader who holds long and short positions at the same time, is his position margined on a gross, net, or portfolio basis?

INE adopts margining on long or short side of position that has larger nominal value. However, when the contract enters the fifth trading day prior to the last trading day, INE will collect the margin from both long and short side.

According to Article 28 of its *Clearing Rules*, INE may collect trading margin from one side only under the following circumstances:

1. For a Client holding both long and short positions in the same product and on the books of the same Member or OSBP, INE may collect trading margin solely from the side for which a larger amount of trading margin is required, except for the contract held after the closing of the fifth (5th) trading day prior to the last trading day;

2. For a Non-FF Member or an OSNBP holding both long and short positions in the same product, INE may collect trading margin solely from the side for which a larger amount of trading margin is required, except for the contract held after the closing of the fifth (5th) trading day prior to the last trading day; and

3. Other circumstances as deemed necessary by INE.

## 102 Margin call will be issued when a Member's clearing deposit balance is lower than the required minimum. What action will INE take for failure to meet the margin call before market open on the following trading day?

As provided in Article 40 of its *Clearing Rules*, "in the event the Member fails to make it up, the following shall apply:
1. If the clearing deposit balance of any internal ledger of the Member with the Exchange is no less than zero, the corresponding Member or OSP of such internal ledger shall not open any new position;
2. If the clearing deposit balance of any internal ledger of the Member with the Exchange is lower than zero, the Exchange shall implement forced position liquidation or take other measures according to the *Risk Management Rules of the Shanghai International Energy Exchange*."

## 103 After a Member completes the internal approval of payment, will the funds transferred by the Member from its margin account to the Exchange's clearing account be an instant transfer?

A member can submit the fund remit request on the INE's Member Service System, using the function of electronic fund transfer, for fund transfer in between such Member's margin account and the Exchange clearing account.

Fund remit instruction into the Exchange's clearing account during market hours will be automatically processed in real time. For fund withdrawal instruction from the Exchange's clearing account, it will only be processed after daily clearing and settlement on the same day.

## 104 Can a domestic/overseas broker provide financing service to its customers in futures trading?

An overseas broker shall conduct its business in accordance the rules and regulation of its jurisdiction. As for domestic futures brokers, they shall follow the policy and regulation of the CSRC.

## 105 Is it required for an offshore institutional investor who trade on INE through an onshore/offshore broker to set up a specified bank account for futures trading purpose?

If an offshore institutional investor, either a futures trader or a brokerage firm, trade on INE though a domestic broker, it's required for such investor to set up a specified bank account for futures trading purpose with a designated depository bank for margin depository business of its overseas clients.

## 106 Can a non-FF Member use foreign currency in trading the crude futures?

No. For domestic traders, including a non-FF Member, they can only use RMB in trading the crude futures.

According to the SAFE's Circular Huifa [2015] No. 35, overseas traders, overseas brokers, or FF Members and other institutions that can execute and clear trades for its overseas clients who trade on behalf of themselves or conduct brokerage business (execute trades for its customers) are allowed to set up foreign currency account for specific purpose.

## 107 Is it true that an OSP can only use FX fund as margin collateral and the trading expenses and daily mark to market result from futures trading can only be settled in RMB?

According to the Article 2 of the Announcement [2015] No. 19 of the People's Bank of China (PBC), Crude oil futures traded within China shall be denominated and settled in Chinese Renminbi (RMB). Also Article 9 of the Announcement states that Any Overseas Trader or Overseas Broker may directly use its foreign exchange as margin. Or the foreign currency fund balance on such person's margin account must be exchanged into RMB before it can be used to settle trades involving domestic crude oil futures.

# 11

# CRUDE OIL FUTURES DELIVERY

# CRUDE OIL FUTURES DELIVERY

## 108 What is the delivery mechanism used by China's crude oil futures?

China's crude oil futures contracts employ physical delivery. Position holders of expired contracts will enter into physical delivery by following the standard delivery procedures prescribed by the Exchange. Alternatively, a position holder can execute an Exchange of Futures for Physicals (EFP) transaction to offset an open position before contract expiration. China's crude oil futures employ bonded delivery system, meaning the physical delivery of the underlying commodity underlying a futures contract position takes place with bonded status within the Customs Special Supervision Areas or on Bonded Supervision Premises. Standard delivery procedures refer to the process by which the buyer and seller complete physical delivery using bonded standard warrants in accordance with prescribed delivery procedures upon contract's expiration.

In essence, sellers need to load the commodity into a designated delivery storage facility and have a bonded standard warrant issued accordingly before the contract expires. Within the five business days following contract expiration, sellers and buyers exchange the delivery payments and warrants. The Exchange matches and allocates available standard warrants in accordance with the principles of "time priority, quantity rounding, nearest matching, and overall arrangement".

## 109 What are China's crude futures deliverable crude grade origination locations?

1. Dubai, UAE: Fateh Terminal;
2. Upper Zakum, UAE: Zirku Island;
3. Murban UAE: Fujairah Terminal or Jebel Dhanna Terminal
4. Oman, The Sultanate of Oman: Mina Al Fahal;
5. Qatar Marine, Qatar: Halul Island;
6. Basrah Light, Iraq: Basrah Oil Terminal or SPM
7. Basrah Medium, Iraq: Basrah Oil Terminal or SPM
8. Tupi,Brazil: Angra Dos Reis, Port Acu, STS Santos, STS Sao Paolo, Sao Sebastian, and FPSO of Brazil, La Paloma of Uruguay, and other loading ports recognized by INE
9. Shengli, PRC: Dongming Oil Terminal of Sinopec Shengli Oilfield Company.

Based on market conditions, the country of origin (or port of loading) of the crude streams is subject to change by the INE through announcements.

## 110 What are the expenses and fees related to crude oil futures delivery?

1. Storage fees at a designated delivery storage facility are capped at 0.20 RMB per barrel per day, shall be paid by the goods title owner, and will be collected by the designated delivery storage facility owner. INE may adjust the storage fee based on market conditions and will announce any change in advance.
2. Delivery Fee is 0.05 yuan/barrel in general, but is waived from January 1, 2025 to December 31, 2025 (including delivery-related fees incurred from EFP and standard warrant transfer through INE clearing services).
3. Inspection fees will be charged by the designated inspection agency to the title owner of commodity goods or its designated agent who request the inspection service at load-in or load-out of goods.

4. Other expenses, such as harbor dues, harbor tolls, shifting charge and other relevant expenses will be charged by the relevant service provider to the title owner of commodity goods or its designated agent.

## 111 What are the designated delivery storage facilities for China's crude oil futures?

The table below lists the capacity of Designated Delivery Storage Facilities for crude oil futures as of February 2025.

| No. | Storage Facilities | Depot | Storage Location | Approved Capacity (10,000 $m^3$) | In-use Capacity | | |
|---|---|---|---|---|---|---|---|
| | | | | | Nominal Volume | | Active Capacity |
| | | | | | 10,000 $m^3$ | 10,000 bbl | 10,000 bbl |
| 1 | Sinopec Petroleum Reserve Co., Ltd. | SPRC Caofeidian | Caofeidian Industrial Zone, Tangshan, Hebei | 100 | 40 | 251.6 | 200 |
| 2 | | SPRC Rizhao | Lanshan North Port Area, Rizhao, Shandong | 120 | 100 | 629 | 520 |
| 3 | | SPRC Zhoushan | Cezi Island, Zhoushan, Zhejiang | 80 | 70 | 440.3 | 350 |
| 4 | | SPRC Zhanjiang | Xinggang Avenue, Lingang Industrial Zone, Zhanjiang, Guangdong | 90 | 60 | 377.4 | 300 |
| 5 | | SPRC Hainan | 83 Bin Hai Avenue, Yangpu Economic Development Zone, Hainan | 100 | 60 | 377.4 | 300 |
| 6 | PetroChina Fuel Oil Co., Ltd. | PetroChina Zhanjiang | Operating Area 2, Zhanjiang Port, 1 Youyi Road , Xiashan District, Zhanjiang, Guangdong | 70 | 50 | 314.5 | 311 |
| 7 | Sinochem-Xingzhong Oil Staging (Zhoushan) Co., Ltd. | Sinochem Xingzhong | Aoshan Island, Lincheng, Dinghai District, Zhoushan, Zhejiang | 100 | 35 | 220.15 | 210.1 |
| 8 | Dalian PetroChina International Warehousing & Transportation Co., Ltd. | PetroChina Dalian | Dalian PetroChina Bonded Depot, New Port, Dalian Bonded Zone, Dalian, Liaoning | 145 | 145 | 912.05 | 829.5 |
| 9 | | PetroChina Dalian Intl | Dalian PetroChina International Reserve Depot, New Port, Dalian Bonded Zone, Dalian, Liaoning | 180 | 180 | 1132.2 | 1080 |
| 10 | | PetroChina Guangxi Intl | Guangxi PetroChina International Reserve Depot, Qinzhou Bonded Area, Guangxi | 20 | 20 | 125.8 | 120 |

| No. | Storage Facilities | Depot | Storage Location | Approved Capacity (10,000 $m^3$) | In-use Capacity | | |
|---|---|---|---|---|---|---|---|
| | | | | | Nominal Volume | | Active Capacity |
| | | | | | 10,000 $m^3$ | 10,000 bbl | 10,000 bbl |
| 11 | Shandong Port Group Co., Ltd. | SPG Qingdao Port Shihua | Dongjiakou Depot Phase I, Qingdao, Shandong | 40 | 40 | 251.6 | 239.2 |
| 12 | | SPG Qingdao Port Haiye Dongjiakou | 88 Gangrun Avenue, Dongjiakou Port, Huangdao District, Qingdao, Shandong | 100 | 40 | 251.6 | 239.2 |
| 13 | Yangshan Shengang International Oil Logistics Co., Ltd. | Yangshan Oil | Shenjiawan, Yangshan Deep-Water Port, Shanghai | 30 | 20 | 125.8 | 126 |
| 14 | Dalian North Oil Petroleum Logistics Co., Ltd. | North Petroleum | Shatuozi, New Port, Dalian Bonded Zone, Dalian, Liaoning | 40 | 10 | 62.9 | 54 |
| 15 | Sinochem-Hongrun Oil Staging (Weifang) Co., Ltd. | Hongrun Oil Storage & Transportation | North of Bohai Street, West of Haifeng Road, Advanced Manufacturing Park, Binhai Economic Development District, Weifang, Shandong | 500 | 300 | 1887 | 1800 |
| 16 | Dading Petroleum Logistics Co., Ltd. | Dading Petroleum | 496 Aoshan East Road, Lincheng Sub-District, Dinghai District, Zhoushan, Zhejiang | 44 | 22 | 138.38 | 130 |
| 17 | SDIC Oil & Gas Terminal Yangpu Co., Ltd. | SOGTY | North side of Yuanyi Road, Chemical Industry Park, Yangpu Economic Development Zone, Hainan | 40 | 20 | 125.8 | 124.5 |

| Group | Type | Name | Location | Approved Capacity | In-use Capacity | | |
|---|---|---|---|---|---|---|---|
| | | | | | Nominal Volume | | Active Capacity |
| | | | | 10,000 $m^3$ | 10,000 $m^3$ | 10,000 bbl | 10,000 bbl |
| Shandong Port Group Co., Ltd. | Group delivery warehouse | Rizhao Port Oil Terminal Co., Ltd. | Phase III oil depot of Rizhao Port Oil Terminal Co., Ltd. in the Lanshan Port District, Rizhao Port | 40 | 40 | 251.6 | 231.46 |
| | Group delivery warehouse | Qingdao ZhenHua Oil Storage Co., Ltd. | South of Weishisan Road and east of Jingshi Road in Dongjiakou Port District, Huangdao District, Qingdao, Shandong Province | 80 | 80 | 503.2 | 471.7 |

## 112 Who are the designated inspection agencies of China's crude oil futures?

The table below lists current Designated Inspection Agencies for crude oil futures:

| No. | Name of Designated Inspection Agency |
|---|---|
| 1 | China Certification & Inspection Group Inspection Co., Ltd. |
| 2 | SGS-CSTC Standards Technical Services Co., Ltd. |
| 3 | Intertek Testing Services Shanghai, Co., Ltd. |
| 4 | Technical Center for Industrial Product and Raw Material Inspection and Testing, Shanghai Customs |

## 113 What is the difference between the warrant-based delivery for China's crude oil futures market and physical delivery in foreign oil futures markets?

Delivery in China's crude oil futures market is conducted through warrants. For the standard warrants submitted by sellers, INE allocates them to buyers based on rules and the buyers' declared intents. The buyers will receive the standard warrants upon payment; the sellers will receive the payment and submit all tax invoices corresponding to the delivered goods.

In overseas markets, futures exchanges do not take part in the specific delivery process after matching buyers with the sellers. The trading parties will need to complete the exchange of payment and goods by themselves.

## 114 What is the logic behind the design of the choice of delivery locations and the capacities of the storage facilities used for China's crude oil futures?

INE's Designated Delivery Storage Facilities are located at major oil ports in the Liaoning Peninsula, Jiaodong Peninsula, Yangtze River Delta, and Pearl River Delta. These oil depots include the oil terminals of State-owned corporations and terminals which are joint venture with domestic and foreign shareholders.

The key elements considered in selecting delivery location are: Oil depots need to be in locations where marine tankers can discharge their cargo, close to oil refineries or an oil trading hub, and depots need to reach a geographical balance between North and South China. The list of INE's designated delivery storage facilities has been posted on the website, and INE will keep exploring qualified oil terminals and adding new designated oil terminals in a timely manner to meet the market needs.

## 115 How can falsified crude oil warrants be identified?

The physical delivery process established for China's crude oil futures requires the seller to submit to the Exchange a certificate of origin and bill of lading from the port of loading, a customs declaration documented form, the ship's loading and discharging records, and other required information. Information contained in these documents must be accurate, without conflicts or inconsistencies. Furthermore, no overside loading or discharging is permitted between the origin and destination in the delivery oil depots. The load-in and load-out inspection of futures-related commodities shall be conducted by the Designated Inspection Agencies in accordance with the inspection standards and methods specified in the Inspection Rules of the corresponding futures products. Standard warrants will only be issued after the crude quality inspection is passed and other documents are verified.

# 116 What are the main features of China's crude oil futures delivery mechanism?

The features for the delivery mechanism of China's crude oil futures are summarized in the table below:

Table 7: The Delivery Characteristics of Shanghai Crude Oil Futures

| | |
|---|---|
| Mixing | Because the price differential for different crude streams will vary depending on the quality of each stream, each deliverable grade of crudes must be stored separately and no mixing is permitted |
| Quality Premium and Discount | Due to quality differences, there will be a fixed price differential established for each deliverable grade. The price differential will be added to/subtracted from the final settlement price for physical delivery |
| Water-Free Settlement | Water content will be deducted when settling overfill and underfill with the oil depot |
| Loss Allowance | A 1.2‰ loss allowance is arranged with the commodity owners at time of load-in and at time of load-out each assumes 0.6‰ |
| Minimum Load-In and Load-Out Quantity | 200,000 barrels. Spot commodity can be combined with the commodity meant for futures delivery to meet the minimum requirement |
| Load-In Intention Notice | A load-in intention should be submitted 30 days in advance of actual load-in along with a deposit of ¥1.5 per barrel (tentative rate) |
| Qualification for Conducting Delivery | Domestic clients who are not able to issue or take specified invoices required by the Tax Bureau are not allowed to participate in physical delivery |
| Expiry of Standard Warrant | Warrants have no expiration date |
| Listing Exchange | Shanghai International Energy Exchange |

Source: Shanghai International Energy Exchange

## 117 According to INE rules, September contracts are delivered in September, which means the crude oil needs to be stored at the designated delivery storage facility by August and purchased by traders from the Middle East starting from May. Given how difficult it is to change the terms of a spot trade once the deal is reached, what can traders do to handle this kind of situation?

For spot crude oil bought in the Middle East, if the seller wants to take delivery against the September contract, the crude needs to be delivered to our designated storage facility and the standard warrant needs to be created by the end of August. For crude oil to be loaded onto ships by August, the transaction and pricing process would have to take place in July. Therefore, the seller needs to consider the price differential between the places of origin and destination, the freight rate, and the shipping schedule before trading futures. For the crude oil that is already stored in an INE-designated facility and the filing for which has already been completed, the seller can sell and deliver it at any time based on market conditions, with consideration given to the cost of storage fees.

## 118 For spot commodity goods imported as a result of physical delivery in the futures market, which price base will be used to calculate the Custom tax? Is it based on the settlement price of delivery or will the traded price when buyer opened its futures position be adopted?

According to Announcement [2015] No. 40 of the General Administration of Customs (the Customs), in the case of import after physical delivery, the dutiable value for the commodity goods is the sum of (a) the delivery settlement price for the crude oil futures contract as published by the Shanghai International Energy Exchange, and (b) any delivery premiums or discounts applied to applicable crude stream.

## 119 In the case when a futures deviates sharply from the spot market price, the EFP price and/or final settlement price for the crude futures contract may diverge significantly from the spot market price. How does the China Customs rule on the dutiable value?

According to the term 5 of the Announcement [2015] No. 40 of the General Administration of Customs:

Customs shall determine the dutiable value of bonded crude oil for futures contracts based on:

(1) the sum of (a) the bonded final settlement price for bonded crude oil as determined by the Shanghai International Energy Exchange, and (b) any delivery premiums or discounts if the bonded crude oil is to be delivered in the delivery month under a Bonded Standard Warrant;

(2) the sum of (a) the settlement price for the crude oil futures contract in the nearest delivery month, as published by the Shanghai International Energy Exchange on the trading day immediately preceding the application date for the Exchange for Physicals (EFP) transaction, and (b) any delivery premiums or discounts, if the bonded crude oil is to be delivered subject to an EFP transaction under a Bonded Standard Warrant;

(3) provisions on domestic sales of bonded goods currently in effect, if the bonded crude oil is either to be delivered in an EFP transaction under a non-standard warrant, or to be transferred under a Bonded Standard Warrant without being delivered against futures contracts in bonded areas; or

(4) the sum of (a) the settlement price for the crude oil futures contract in the nearest delivery month, as published by the Shanghai International Energy Exchange on the trading day immediately preceding the completion date for the load-out of the bonded crude oil, and (b) any delivery premiums or discounts, for and in relation to quantity of any overfill and underfill present during the delivery and import of the bonded crude oil.

## 120 How will the final settlement price be determined in the case where a contract closes at limit up or down on one of the last trading? Shall the calculation of mean average of 5 daily settlement prices that have trades executed on each sampling trading day exclude the sample of settlement price that is closed at limit high or low?

According to Article 155 of the *Delivery Rules of the Shanghai International Energy Exchange*, the final settlement price of the crude oil futures is the benchmark price for the delivery settlement of crude oil futures, and is calculated as the arithmetic mean value of the settlement prices of that contract during the last five (5)trading days based on executed transactions in the futures contract.

## 121 In a situation where the load-in deadline is missed due to port congestion, can the seller request in advance for relaxing the delivery window?

Yes, a relaxation of the delivery window can be arranged. However, sellers still need to adhere to the deadline for physical delivery.

To prevent this situation from happening, the load-in application is required to be submitted to the Exchange at least 30 days prior to the actual load-in of goods. Once the load-in application is approved, the oil tanker of the seller should be included in the port unloading schedule. INE has requested all the designated delivery storage facilities to prioritize the unloading of oil tanker involved in making physical futures delivery. Thus if oil tanker arrives at the discharging port on schedule, the unloading shall be completed as scheduled. However, if the oil tanker fails to arrive the discharging port in time, it loses its priority status and must reschedule the unloading time with the port and queue in line with other oil tankers carrying spot goods.

An oil depot is entitled to not accept any crude oil if the source of which is questionable and not satisfactorily explained by the load-in applicant.

## 122 Please explain what is the meaning of "the applied load-in futures commodities shall be shipped directly from the port of the place of origin" (Article 40 of the INE Delivery Rules)? Can crude oil in a floating storage for half a year be used in delivery?

The appendix of the Inspection Rules lists the requirements on the loading port of each deliverable crude stream. Only deliverable crude loaded from the designated ports can be used in the physical delivery of INE crude oil futures.

## 123 How does a designated delivery storage facility conduct supervision and management of the transportation of commodities as prescribed in Article 40 of the INE Delivery Rules?

A designated delivery storage facility monitors the transport of commodities by checking an oil tanker's shipping schedule, logbook, and AIS signal.

## 124 Article 131 of the INE Delivery Rules states that certain registered commodities approved by INE for exemption from inspection may be exempted from quality inspection at delivery. Does this exemption apply to all the deliverable crude oils?

No, because commodity registration does not apply to crude oil futures.

## 125 Article 83 of the INE Delivery Rules states that Designated Delivery Storage Facilities should cooperate with the commodity owners in coordinating with the terminal, port, pipeline company, customs, and commodity inspection agency to ensure priority for the load-in and load-out. Can INE be more specific about what arrangements it has with the customs and inspection agencies to ensure owners are given such priority in practice?

A spot commodity is the underlying and base of a commodity future contract. The loading and unloading of commodity goods for future physical delivery in the futures market shall also be consistent with regular spot market practices. A designated delivery storage facility shall carry out the duty of disclosure and provide professional grade service to the commodity owner for futures physical delivery in its power.

Guarantee on the prioritized load-in and-out of commodity goods for futures delivery will only be applicable when ships of spot goods and commodity goods for futures delivery arrive an oil terminal at the same time.

To solve the issue of demurrage, the load-in application for goods for futures delivery is required to be submitted to the Exchange at least 30 days prior to the actual load-in of goods. Once the load-in application is approved, the oil tanker of the seller should be included in the port unloading schedule.

In coordination with the Customs and the commodity inspection authority or other relevant authorities, the commodity goods owner and oil terminal shall follow the regular spot market practice.

## 126 Compared with the spot trade, the cost related to crude oil futures delivery (including storage fees, inspection fees and other expenses) is very high. Are there any alternative ways to lower the cost?

According to relevant regulations, currently INE can carry out Exchange for Physicals (EFP) for both standard warrants and non-standard warrants. At present, the following two types of non-standard warrants for EFP can be conducted:

1)Both the buyer and seller are domestic institutions. The underlying delivery asset is the crude oil, which has been paid by seller in RMB and responsible by seller to conduct import customs procedure and formalities.

2)The buyer is a domestic institution and the seller is an overseas institution. The underlying delivery asset is the crude oil, which has been paid by buyer in RMB or foreign currency and responsible by buyer to conduct import customs procedure and formalities.

## 127 Is it possible to use approaches such as oil lighterage, cargo assembly and etc. to reduce delivery costs?

According to the INE Delivery Rules, the applied load-in futures commodities shall be shipped directly from the port of the place of origin, only two of the deliverable crude grades are allowed to be assembled at the designated port of shipment. At present, the relevant regulatory policies and operational details of transferred crude oil lighterage load-in mechanism is under study.

# 12

# TRADE AT SETTLEMENT (TAS)

## 128 What is TAS?

TAS, short for Trade at Settlement, is an order type that allows a trader to buy or sell an eligible futures contract during specified trading hours at the current day's settlement price or a certain number of ticks of the outright above or below that price.

## 129 Why did INE launch TAS orders?

TAS order aims to provide an efficient and effective risk management tool in the market which can lower traders' risk management costs, so as to enhance the proportion of brick-and-mortar enterprise investors and the crude oil price influence.

For brick-and-mortar enterprises, the futures settlement price is often used as the benchmark price in spot trading. These enterprises used to place orders frequently to simulate the settlement price, which is difficult to execute as well as inefficient for hedging. TAS orders enable investors to trade at or near the settlement price during specified trading hours, which will greatly reduce the uncertainty they used to face when hedging. As a result, they can exercise better risk management easily with TAS.

In western financial markets, in addition to brick-and-mortar enterprises, institutional investors including ETFs and long-term capital management funds also use TAS for position transfers which require lower fees for hedging purposes. Moreover, it will also reduce the short-term adverse effect of position transfers to the market.

To sum up, TAS trading will enhance the hedging efficiency for entities as an efficient risk management tool, attract more diversified market participants and enhance the proportion of brick-and-mortar investors. As it is more convenient for global investors to refer to China's futures prices, the price influence will surely be improved.

## 130 Who can place TAS orders for crude oil futures?

Any trader of crude oil futures can place TAS orders.

## 131 Which crude oil futures contracts are eligible for TAS orders?

TAS order is only available to the nearby crude oil futures contract and the three monthly contracts thereafter (hereinafter referred to as the "eligible contracts"), and will no longer be available after the market close on the eighth trading day preceding the last trading day of the relevant eligible contract.

## 132 What is the price quote of TAS orders for crude oil futures?

The price range for TAS orders is the underlying contract's daily settlement price ± 2 yuan/barrel. TAS orders executed at above or below the contract's price limit will be settled at the corresponding price limit.

## 133 What are the trading hours of TAS orders for crude oil futures?

TAS orders for crude oil futures are available during the opening auction, the first trading session, and 10:30 a.m. to 11:30 a.m. of the daytime trading hours. At the end of the TAS trading hours, all unmatched TAS orders are automatically cancelled by the system.

## 134 What are the matching rules of crude oil TAS orders?

TAS orders may only be matched with other TAS orders for the same contract. TAS orders are matched by the "trading volume maximization" rule during central auction and by price-time priority during continuous auction.

## 135 What are the attributes of TAS orders for crude oil futures?

Same as other orders, TAS orders may be indicated as "open", "close today", or "close previous"; and "general" or "hedging."

## 136 Can other properties be attached with a TAS order for crude oil futures?

TAS orders cannot be attached with the properties of fill-or-kill (FOK) or fill-and-kill (FAK) for the time being.

## 137 How will INE collect the margin of a TAS trade for crude oil futures?

During the trading hours,INE will calculate the margin to be frozen or released for a TAS trade based on the previous settlement price of the underlying contract, and will include the margin into the larger-side margining.

At the end of a trading day, INE will collect the margin for a TAS trade based on that day's settlement price of the underlying contract, and will include the margin into the larger-side margining.

## 138 How will INE collect the transaction fees of a TAS trade for crude oil futures?

Please refer to the provisions on TAS-eligible crude oil futures contracts.

## 139 How to access the market data of TAS trades for crude oil futures?

Traders can find relevant market data on the official websites and member service systems of SHFE and INE, or through the apps of other data providers. Market data of TAS-eligible contracts published during trading hours does not include turnover and trading volume from TAS transactions. Statistics following market close and settlement do reflect TAS transactions in the turnover and trading volume of the corresponding contracts.

## 140 If the eligible contract is traded only by TAS order, how would the daily settlement price be determined? How to determine the settlement price of the TAS order?

If the eligible contract is traded only by TAS order, it will be considered as having not been executed on that day, and its daily settlement price will be determined in the same manner in accordance with the Clearing Rules of the Shanghai International Energy Exchange as for futures contracts without an execution price. For example, if the settlement price for SC2010 is $305.0/bbl and a TAS sell order is matched at $1.2/bbl, then the TAS order will be settled at $306.2/bbl. TAS orders executed at above or below the contract's price limit will be settled at the corresponding price limit.

# 141 How to open positions using TAS?

**Example 1:**

Assume a client has no existing position on SC2308 and places a TAS order for 40 lots on SC2308 as "long, general, open", which is then matched with an existing TAS order for short 15 lots at a price of 1.2 yuan/barrel. As a result, the client will hold 15 lots of long, general, and today's position on SC2308. The remaining 25 lots will be automatically canceled by the system if they cannot be matched by 11:30 a.m.

If at market close the settlement price of SC2308 is determined to be 560.7 yuan/barrel, then the 15 lots filled through the TAS order will be finally traded at 561.9 yuan/barrel.

**Example 2:**

Assume a client has no existing position on SC2309 and submits a TAS "short, general, open" order for 10 lots. After 5 lots are filled at a price of -0.8 yuan/barrel, the client will hold 5 lots of short, general, and today's position on SC2309. If now the client places and executes a limit order (not TAS) for 3 lots of SC2309 as "long, general, and close today", the client will hold 2 lots of short, general, and today's position on SC2309.

If at market close the settlement price of SC2309 is determined to be 559.6 yuan/barrel, then the 5 lots filled through the TAS order will be finally traded at 558.8 yuan/barrel.

## 142 How to close out today's position using TAS?

**Example:** Assume a client has no existing position on SC2309 and submits a limit order (not TAS) for 10 lots of SC2309 as "short, general, and open". After 4 lots are filled, the client will hold 4 lots of short, general, and today's position on SC2309. If the client then places and executes a TAS "long, general, close today" order for 1 lot at 0 yuan/barrel, the client will hold 3 lots of short, general, and today's position on SC2309.

If at market close the settlement price of SC2309 is determined to be 559.6 yuan/barrel, then the 1 lot filled through the TAS order will be finally traded at 559.6 yuan/barrel.

## 143 How to close out previous positions using TAS?

**Example:** Assume a client holds 50 lots of long, hedging, and previous position on SC2310, and places a TAS order for 50 lots as "short, hedging, and close previous". Once 40 lots of the TAS order are filled at a price of -1.0 yuan/barrel, the client will hold 10 lots of long, hedging, and previous position on SC2310.

If at market close the settlement price of SC2310 is determined to be 553.7 yuan/barrel, then the 40 lots filled through the TAS order will be finally traded at 552.7 yuan/barrel.

## 144 What if the TAS order is executed at a price above or below the contract's price limit?

**Example:** On a given day the lower price limit of SC2311 is 551.2 yuan/barrel. Assume a client has no existing position on SC2311 and submits a TAS "short, general, and open" order for 10 lots on that day. Once 5 lots of the order are filled at -2.0 yuan/barrel, the client will hold 5 lots of short, general, and today's positions on SC2311.

At market close the settlement price of SC2311 is determined to be 552.9 yuan/barrel. Because the rules of the Exchange say that the transaction price of TAS orders may not exceed the upper or lower limit price of the contract, the 5 lots filled through the TAS order will be finally traded at 551.2 yuan/barrel.

## 145 How to Use TAS Orders for Hedging?

**Example 1:**

On September 12, refinery A purchased 100,000 metric tons of medium sour crude oil from trader B, and it was agreed that the oil would be delivered on October 15-24 at the average settlement price of SC1912 in October at a discount of 7 yuan/barrel. Refinery A was scheduled to pay after market close on October 31.

As the OPEC cut production and supply went tight, refinery A believed that there was limited downside risk for SC1912. To hedge the risk of higher prices in October, refinery A decided to long 720 lots of SC1912 on September 12 at 437.9 yuan/barrel.

SC1912 began trading on October 8 after China's national holidays. In October, refinery A closed out the positions using TAS orders at a price of 0 yuan/barrel. (100,000 metric tons of medium crude oil are equivalent to 720,000 barrels, or approximately 720 lots of futures contracts. Since there were a total of 18 trading days in October, 40,000 barrels or 40 lots were sold each trading day.)

| Date | Futures Market | Price (yuan/bbl) | Gain on Futures Positions (yuan/bbl) | Barrels Calculated in the Spot Market |
|---|---|---|---|---|
| Sept. 12 | Long 720 lots | 437.9 | - | - |
| Oct. 8 | Short 40 lots using TAS | 432.9 | -5 | 40,000 |
| Oct. 9 | Short 40 lots using TAS | 440 | 2.1 | 40,000 |
| … | … | … | … | … |
| Oct. 16 | Short 40 lots using TAS | 455.7 | 17.8 | 40,000 |
| Oct. 17 | Short 40 lots using TAS | 448.5 | 10.6 | 40,000 |
| … | … | … | … | … |
| Oct. 30 | Short 40 lots using TAS | 454.2 | 16.3 | 40,000 |
| Oct. 31 | Short 40 lots using TAS | 452.2 | 14.3 | 40,000 |
| Total (in October) | Short 720 lots using TAS | 449.57 (monthly average) | 11.67 | 720,000 |
| Outcome | The gain in the futures market is 449.57-437.9=11.67 yuan/barrel.<br>The settlement price was locked in to 437.9 yuan/barrel.<br>The actual trading price was 437.9-7=430.9 yuan/barrel. | | | |

**Example 2:**

On September 12, refinery A purchased 100,000 metric tons of medium sour crude oil from trader B, and it was agreed that the oil would be delivered on October 15-24 at the average settlement price of SC1912 in October at a discount of 7 yuan/barrel. Refinery A was scheduled to pay after market close on October 31.

SC1912 began trading on October 8 after China's national holidays. As the price went up, refinery A believed it was overvalued and may experience a correction later. Therefore, on October 11, refinery A decided to short the futures when the price was over 450 yuan/barrel and to lock in the price when it dropped below 450 yuan/barrel.

As shown in the table below, by using TAS orders, refinery A shorted the same amount of oil as calculated in the spot market on October 11-16 at a price of 0 yuan/barrel, and closed out on October 18-23 at 0 yuan/barrel to lock in the settlement price. (100,000 metric tons of medium crude oil are equivalent to 720,000 barrels, or approximately 720 lots of futures contracts. Since there were a total of 18 trading days in October, 40,000 barrels or 40 lots were sold or closed out each trading day.)

| Date | Settlement Price (yuan/bbl) | Barrels Calculated in the Spot Market | Futures Market | Gain on Futures Positions (yuan/bbl) | Barrels Calculated in the spot Market after Hedging |
|---|---|---|---|---|---|
| Oct. 8 | 432.9 | 40,000 | | | 40,000 |
| … | … | … | | | |
| Oct. 11 | 451.8 | 40,000 | Short 40 lots using TAS | | N/A |
| Oct. 14 | 464.8 | 40,000 | Short 40 lots using TAS | | N/A |
| Oct. 15 | 459.4 | 40,000 | Short 40 lots using TAS | | N/A |
| Oct. 16 | 455.7 | 40,000 | Short 40 lots using TAS | | N/A |
| Oct. 17 | 448.5 | 40,000 | | | 40,000 |
| Oct. 18 | 444.9 | 40,000 | Close out 40 lots using TAS | 6.9 | 80,000 |
| Oct. 21 | 446.3 | 40,000 | Close out 40 lots using TAS | 18.5 | 80,000 |
| Oct. 22 | 442.4 | 40,000 | Close out 40 lots using TAS | 17 | 80,000 |
| Oct. 23 | 444.7 | 40,000 | Close out 40 lots using TAS | 11 | 80,000 |
| … | … | … | | | |
| Oct. 31 | 448.56 | 40,000 | | | 40,000 |
| Total | 449.57 monthly average | 720,000 | | | |
| Outcome | The gain of 160 lots in the futures market is/4=13.35 yuan/barrel. Considering the profit in the futures market, the average settlement price per barrel was brought down from 449.57 yuan to 446.6 yuan. The actual trading price was 446.6-7=439.6 yuan/barrel. | | | | |

# 146 How to Use TAS Trading in Fund Management by ETFs?

On November 8, market maker A purchased one million shares of crude oil ETF from a fund manager B (the minimum purchasing volume is 500,000 shares). These shares would be effective on November 9, and be settled according to the actual buying price of from the exchange by fund manager B. On November 8, the settlement price of SC 2012 was 462.1 yuan/barrel, and thus the price of one share was 0.9242 yuan.

To avoid price fluctuations, market maker A shorted two lots of crude oil futures at 461.6 yuan/barrel on November 8. On November 9, the futures price went up by 1% to 466.7 yuan/barrel (assume that the secondary market moves simultaneously with the futures market). Market maker A sold all the EFT shares and closed out the positions on crude oil futures. Suppose that fund manager B purchased the shares from the exchange at 465 yuan/barrel, the overall profit/loss of market maker A was calculated in the table below (without considering any transaction fees):

| Profit/Loss (yuan) | Spot Market | | Futures Market | |
|---|---|---|---|---|
| | Buy | 465*2,000=930,000 | Short | 461.6*2,000=923,200 |
| | Sell | 0.9242*1.01*1,000,000=933,400 | Close out | 466.7*2,000=933,400 |
| Total | 933,400-930,000=3,400 | | 923,200-933,400=-10,200 | |
| Outcome | Market maker A lost 6,800 yuan in total due to the difference between the short price in the futures market and the purchasing price in the spot market. | | | |

With TAS, market maker A could require that fund manager B should trade the SC2012 contract by using TAS orders on November 9, and market maker A would short the same amount of contracts using TAS orders at a price of 0 yuan/barrel too. Suppose that the settlement price on that day was 465.9 yuan/barrel, the overall profit/loss of market maker A is calculated in the table below (without considering any transaction fees):

| Profit/Loss (yuan) | Spot Market | | Futures Market | |
|---|---|---|---|---|
| | Buy | 465.9*2,000=931,800 | Short | 465.9*2,000=931,800 |
| | Sell | 0.9242*1.01*1,000,000=933,400 | Close out | 466.7*2,000=933,400 |
| Total | Breakeven | | | |

# APPENDIX

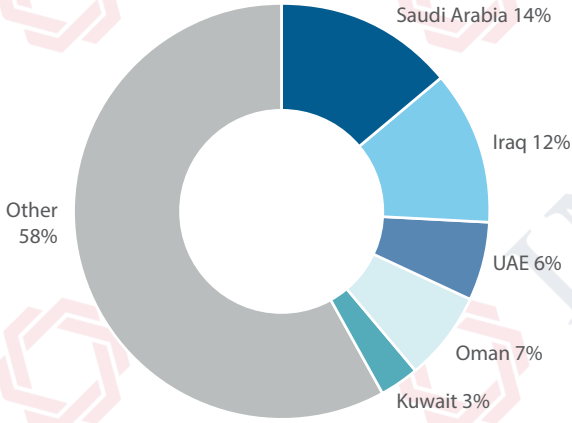
## Appendix 1: 2016-2020 Annual Production of China's Major Oilfields (1,000 metric tons)

| Oil & Gas Fields / Producer | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|
| CNPC Total | 10,545 | 10,253.7 | 10,101.7 | 10,176.9 | 10,225.3 |
| Daqing Oilfield | 3,656 | 3,400 | 3,204.4 | 3,090 | 3,001 |
| Jilin Oilfield | 404.5 | 390 | 393.7 | 396.7 | 400 |
| Liaohe Oilfield | 974.1 | 1,000.1 | 995.1 | 1,007.6 | 1,004.3 |
| Huabei Oilfield | 411 | 403.1 | 407.2 | 413 | 416 |
| Dagang Oilfield | 407.9 | 402.8 | 407 | 417 | 415 |
| Jidong Oilfield | 135 | 136 | 130 | 137 | 127.5 |
| Zhejiang Oilfield | 3 | 3 | 3 | 2.1 | 2 |
| Xinjiang Oilfield | 1,113 | 1,131 | 1,147 | 1,247 | 1,320 |
| Turpan-Hami Oilfield | 200 | 190 | 185 | 165 | 157 |
| Tarim Oilfield | 550 | 520.2 | 551.5 | 576 | 602 |
| Changqing Oilfield | 2,392 | 2,372 | 2,377 | 2,416 | 2,467.2 |
| Qinghai Oilfield | 221 | 228 | 223.3 | 228 | 228.5 |
| Yumen Oilfield | 38 | 40 | 41 | 45.2 | 49 |
| Southwest Oil & Gas Field | 10 | 7.4 | 5.9 | 5.7 | 5.2 |
| South China Exploration & Development | 29.5 | 30 | 30.5 | 30.5 | 30.6 |
| Sinopec Total | 3,565.5 | 3,505.4 | 3,506 | 3,513.1 | 3,514.4 |
| Shengli Oilfield | 2,390.2 | 2,341.6 | 2,341 | 2,340.5 | 2,340.1 |
| Henan Oilfield | 168.9 | 156.5 | 136 | 130 | 120 |
| Zhongyuan Oilfield | 146.7 | 126.4 | 125.3 | 124 | 125.1 |
| Jianghan Oilfield | 73.7 | 69.6 | 68.1 | 67.9 | 68 |
| Jiangsu Oilfield | 128 | 115.1 | 109.2 | 102.4 | 101 |
| Northeast Oilfield | 3.5 | 1.8 | 3 | 5.1 | 4.4 |
| Huabei Oilfield | 7.2 | 8.6 | 11.3 | 14.5 | 16.4 |
| Northwest Oilfield | 594.3 | 630 | 650 | 662 | 670 |
| Huadong Oilfield | 33 | 36 | 42.2 | 45.3 | 46 |
| Southwest Oil & Gas Field | 0.7 | 1.3 | 2.2 | 2.7 | 2.7 |
| Shanghai Offshore Oil & Gas | 10.5 | 11 | 11.1 | 12.9 | 15.8 |
| Unlisted and Other Companies | 8.8 | 7.4 | 6.7 | 5.7 | 4.8 |
| CNOOC Total [1] | 4,565.4 | 4,278 | 4,200.7 | 4,301.4 | 4,541.8 |
| Shaanxi Yanchang Petroleum (Group) Co., Ltd. | 1,105.6 | 1,107.2 | 1,120.1 | 1,120.1 | 1,120.2 |
| National Total I (as reported by enterprise) [2] | 19,771.1 | 19,133.2 | 18,917.5 | 19,093.8 | 19,377.7 |
| National Total II (as reported by National Bureau of Statistics) [3] | 19,968.5 | 19,150.6 | 18,932.4 | 19,101.4 | 19,476.9 |

Source: CNPC, Sinopec, CNOOC, Shaanxi Yanchang Petroleum (Group), National Bureau of Statistics.

Notes: Crude oil production figures includes NGLs. (1) Production in Chinese offshore regions of all joint ventures are included. (2) The total production of all companies listed in the table minus the double-counted working interest production of Sinopec in CNOOC's total figure. (3) The annual data published by the Statistic Bureau of Statistics.

Appendix 2: Share of China's Crude Oil Import from Middle Eastern Countries in 2024




Source: General Administration of Customs

## Appendix 3: 2019-2024 China Crude Oil Imports and Exports

| | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|
| Import | 50572 | 54239 | 51298 | 50828 | 56399 | 55342 |
| Export | 81 | N/A | N/A | N/A | N/A | N/A |
| Net Import | 50491 | 54239 | 51298 | 50828 | 56399 | 55342 |

Source: General Administration of Customs

Unit: 10,000 metric tons

## Appendix 4: 2024 Approved Re nery Quota with Imported Crude Oil

| | Company | Quota | 2024 Wave 1 | 2024 Wave 2 |
|---|---|---|---|---|
| 1 | Shandong Dongming Petrochemical Group | 750 | | 750 |
| 2 | Sinochem Hongrun Petrochemical | 530 | 160 | 370 |
| 3 | Shandong Kenli Petrochemical Group | 252 | | 252 |
| 4 | Lihuayi Lijin Refining & Chemical | 350 | 10 | 340 |
| 5 | Dongying Yatong Petrochemical | 276 | | 276 |
| 6 | Shandong Tianhong Chemical | 440 | | 440 |
| 7 | Shandong Shouguang Luqing Petrochemical | 258 | 82 | 176 |
| 8 | Shandong Chambroad Petrochemicals | 331 | | 331 |
| 9 | Dongying Qirun Chemical | 220 | 10 | 210 |
| 10 | Wudi Xinyue Chemical | 240 | 17 | 223 |
| 11 | Hebei Xinhai Chemical Group | 372 | | 372 |
| 12 | Shandong Jincheng Petrochemical Group | 300 | 17 | 283 |
| 13 | Shandong Shenchi Chemical Group | 252 | 4 | 248 |
| 14 | Dongying Haike Ruilin Chemical | 210 | | 210 |
| 15 | Henan Fengli Petrochemical | 222 | | 222 |
| 16 | Shaanxi Yanchang Petroleum Group | 360 | | 360 |
| 17 | Jinao (Hubei) Science & Technology Chemical Industry | 230 | | 230 |
| 18 | Rizhao Landbridge Port Petrochemical | 180 | | 180 |
| 19 | Shandong Shengxing Chemical | 220 | | 220 |

| | Company | Quota | 2024 Wave 1 | 2024 Wave 2 |
|---|---|---|---|---|
| 20 | Shandong Qicheng Petrochemical | 160 | 26 | 134 |
| 21 | Shandong Dongfang Hualong Industry & Trade Group | 300 | 25 | 275 |
| 22 | Dalian Jinyuan Petroleum and Chemical | 80 | | 80 |
| 23 | Zibo Xintai Petrochemical | 200 | 14 | 186 |
| 24 | PetroChina International | 58 | | 58 |
| 25 | PetroChina International Horgas | 32 | | 32 |
| 26 | PetroChina International Alashankou | 22 | | 22 |
| 27 | Fujian Refining & Petrochemical | 12 | | 12 |
| 28 | CNOOC (Beijing) Trading | 22 | | 22 |
| 29 | North Huajin Chemical Industries Group | 830 | | 830 |
| 30 | China National Chemical Corporation | 1712 | | 1712 |
| 31 | Huayue Group | 25 | | 25 |
| 32 | Erlian Gaolu Foreign Economic & Trade | 18 | | 18 |
| 33 | Tenglong Aromatic Hydrocarbon (Zhangzhou) | 400 | | 400 |
| 34 | Hengli Petrochemical (Dalian) | 2000 | 100 | 1900 |
| 35 | Zhejiang Petroleum & Chemical | 4000 | | 4000 |
| 36 | Shandong Hualian Petroleum & Chemical | 170 | 3 | 167 |
| 37 | Jiangsu Xinhai Petrochemical | 230 | | 230 |
| 38 | Shandong Wantong Petrochemical Group | 195 | | 195 |
| 39 | China International United Petroleum & Chemicals | 280 | | 280 |
| 40 | Shenghong Petrochemical | 1600 | | 1600 |
| 41 | Xinjiang Guanghui Petroleum | 30 | | 30 |

Unit: 10,000 metric tons

Source: National Development and Reform Commission; Ministry of Commerce; compiled by INE

## Appendix 5: Crude Oil Pricing Benchmarks for Major Middle Eastern Oil-Producing Countries

| Country | Destination | | |
|---|---|---|---|
| | Asia | Europe | United States |
| Saudi Arabia | Oman/Dubai Average (1) | ICE BWAVE from Jul. 2000; Dated Brent until Jun. 2000 | Argus ASCI from Jan. 2010; NYMEX WTI until Dec. 2009 |
| Kuwait | Platts Oman/Dubai Average | ICE BWAVE from Jul. 2000; Dated Brent until Jun. 2000 | Argus ASCI from Dec. 2009; NYMEX WTI until Nov. 2009 |
| Iran | Platts Oman/Dubai Average | ICE BWAVE from Jan. 2001; Dated Brent until Dec. 2000 | |
| Iraq | Oman/Dubai Average (2) | Dated Brent | Argus ASCI from Apr. 2010; NYMEX WTI Second Month until Mar. 2010 |

(1) Starting from October 2018, official pricing formula has been changed to the average monthly price of GME's Oman crude oil futures and the average spot price of Dubai crude oil provided by Platts, each with a weighting of 50%.

(2) According to Reuters, Iraq told its customers that it planned to switch its price benchmark for Asia-bound Basrah Light to GME's Oman crude oil futures from January 2018.

## Appendix 6: Trading Volume of Major Global Crude Oil Contracts in 2024

| | Exchange | Contract | Volume (lot) |
|---|---|---|---|
| 1 | Multi Commodity Exchange of India | Crude Oil Options | 486,099,226 |
| 2 | ICE Futures Europe | Brent Crude Oil Futures | 291,954,459 |
| 3 | New York Mercantile Exchange | WTI Light Sweet Crude Oil (CL) Futures | 220,153,362 |
| 4 | ICE Futures Europe | WTI Light Sweet Crude Oil Futures | 83,927,031 |
| 5 | ICE Futures Europe | Brent Crude Oil Options | 54,254,774 |
| 6 | Shanghai International Energy Exchange | Medium Sour Crude Oil Futures | 38,563,472 |
| 7 | New York Mercantile Exchange | Crude Oil (LO) Options | 37,150,498 |
| 8 | Multi Commodity Exchange of India | Crude Oil Mini Options | 25,843,457 |
| 9 | Shanghai International Energy Exchange | Medium Sour Crude Oil Options | 14,912,674 |
| 10 | National Stock Exchange of India | WTI Crude Oil Options | 14,585,142 |

Source: FIA

Note: MCX's crude oil futures is 100 bbl/lot.

Appendix 7: Characteristics of Major Imported Crude Oils of China

| Crude | Country of Origin | Density at 20 ° C ($kg/m^3$) | API Gravity (° ) | Sulfur Content (W%) | Classification |
|---|---|---|---|---|---|
| Arab Medium | Saudi Arabia | 875.3 | 29.41 | 2.63 | High Sulfur, Medium, Intermediate |
| Arab Light | Saudi Arabia | 866.0 | 31.11 | 2.03 | High Sulfur, Medium, Intermediate |
| Cabinda | Angola | 864.5 | 31.39 | 0.13 | Low Sulfur, Medium, Paraffinic |
| Iran Heavy | Iran | 883.9 | 27.85 | 2.15 | High Sulfur, Medium, Intermediate |
| Iran Light | Iran | 859.4 | 32.35 | 1.49 | Sour, Medium, Intermediate |
| Sirri | Iran | 859.5 | 32.33 | 2.08 | High Sulfur, Medium, Intermediate |
| Urals | Russia | 864.5 | 31.39 | 1.38 | Sour, Medium, Intermediate |
| Oman | Oman | 860.6 | 32.12 | 1.03 | Sour, Medium, Paraffinic |
| Basrah | Iraq | 885.4 | 27.58 | 3.10 | High Sulfur, Medium, Intermediate |
| Dar Blend | Sudan | 904.5 | 24.50 | 0.11 | Low Sulfur, Heavy, Paraffinic |
| Mesa | Venezuela | 872.9 | 29.85 | 1.06 | Sour, Medium, Paraffinic |
| Kuwait | Kuwait | 873.2 | 29.79 | 2.68 | High Sulfur, Medium, Intermediate |
| Murban | UAE | 828.2 | 38.50 | 0.74 | Sour, Light, Intermediate |

Source: General Administration of Customs

## Appendix 8: The Total Proved Reserves of OECD Countries 2020

| | Unit: 1 billion bbl | Unit: 1 billion mt | Percentage (by bbl) |
|---|---|---|---|
| Canada | 168.1 | 27.1 | 9.70% |
| Mexico | 6.1 | 0.9 | 0.40% |
| US | 68.8 | 8.2 | 4.00% |
| Total North America | 242.9 | 36.1 | 14.00% |
| Argentina | 2.5 | 0.3 | 0.10% |
| Brazil | 11.9 | 1.7 | 0.70% |
| Colombia | 2 | 0.3 | 0.10% |
| Ecuador | 1.3 | 0.2 | 0.10% |
| Peru | 0.7 | 0.1 | ◆ |
| Trinidad & Tobago | 0.2 | ^ | ◆ |
| Venezuela | 303.8 | 48 | 17.50% |
| Other S. & Cent. America | 0.8 | 0.1 | ◆ |
| Total S. & Cent. America | 323.4 | 50.8 | 18.70% |
| Denmark | 0.4 | 0.1 | ◆ |
| Italy | 0.6 | 0.1 | ◆ |
| Norway | 7.9 | 1 | 0.50% |
| Romania | 0.6 | 0.1 | ◆ |
| United Kingdom | 2.5 | 0.3 | 0.10% |
| Other Europe | 1.6 | 0.2 | 0.10% |
| Total Europe | 13.6 | 1.8 | 0.80% |
| Azerbaijan | 7 | 1 | 0.40% |
| Kazakhstan | 30 | 3.9 | 1.70% |
| Russian Federation | 107.8 | 14.8 | 6.20% |
| Turkmenistan | 0.6 | 0.1 | ◆ |
| Uzbekistan | 0.6 | 0.1 | ◆ |
| Other CIS | 0.3 | ^ | ◆ |
| Total CIS | 146.2 | 19.9 | 8.40% |
| Iran | 157.8 | 21.7 | 9.10% |
| Iraq | 145 | 19.6 | 8.40% |
| Kuwait | 101.5 | 14 | 5.90% |
| Oman | 5.4 | 0.7 | 0.30% |
| Qatar | 25.2 | 2.6 | 1.50% |
| Saudi Arabia | 297.5 | 40.9 | 17.20% |
| Syria | 2.5 | 0.3 | 0.10% |
| United Arab Emirates | 97.8 | 13 | 5.60% |
| Yemen | 3 | 0.4 | 0.20% |
| Other Middle East | 0.2 | ^ | ◆ |
| Total Middle East | 835.9 | 113.2 | 48.30% |

| | Unit: 1 billion bbl | Unit: 1 billion mt | Percentage (by bbl) |
|---|---|---|---|
| Algeria | 12.2 | 1.5 | 0.70% |
| Angola | 7.8 | 1.1 | 0.40% |
| Chad | 1.5 | 0.2 | 0.10% |
| Republic of Congo | 2.9 | 0.4 | 0.20% |
| Egypt | 3.1 | 0.4 | 0.20% |
| Equatorial Guinea | 1.1 | 0.1 | 0.10% |
| Gabon | 2 | 0.3 | 0.10% |
| Libya | 48.4 | 6.3 | 2.80% |
| Nigeria | 36.9 | 5 | 2.10% |
| South Sudan | 3.5 | 0.5 | 0.20% |
| Sudan | 1.5 | 0.2 | 0.10% |
| Tunisia | 0.4 | 0.1 | ♦ |
| Other Africa | 3.8 | 0.5 | 0.20% |
| Total Africa | 125.1 | 16.6 | 7.20% |
| Australia | 2.4 | 0.3 | 0.10% |
| Brunei | 1.1 | 0.1 | 0.10% |
| China | 26 | 3.5 | 1.50% |
| India | 4.5 | 0.6 | 0.30% |
| Indonesia | 2.4 | 0.3 | 0.10% |
| Malaysia | 2.7 | 0.4 | 0.20% |
| Thailand | 0.3 | ^ | ♦ |
| Vietnam | 4.4 | 0.6 | 0.30% |
| Other Asia Pacific | 1.3 | 0.2 | 0.10% |
| Total Asia Pacific | 45.2 | 6.1 | 2.60% |
| of which: OECD | 260 | 38.3 | 15.00% |
| Non-OECD | 1472.4 | 206.1 | 85.00% |
| OPEC | 1216 | 172 | 70.20% |
| Non-OPEC | 516.4 | 72.4 | 29.80% |
| European Union | 2.4 | 0.3 | 0.10% |

Source: EI Statistical Review of World Energy 2024

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