General Introduction to Iron Ore

I. What is Iron Ore

Iron ore refers to the ore that has use value, contains iron element or iron compounds, and is the important raw material for iron and steel production. The ore products are gradually selected from the natural ore through the procedures such as crushing, grinding, magnetic separation, flotation, etc. After that, XXXXXX According to the

principle of element conservation, it takes 1.6 tons of iron ore to produce 1 ton of cast iron with 60% grade, accounting for 50%-60% of cast iron cost.

There are two ways of mining, open-pit mining as well as underground mining. Many large-scale mines in overseas countries are open-pit, therefore, the cost is relatively low. In China, on the other hand, few mines are open-pit, and they've been mined for quite long time, therefore, underground mining prevails, and the cost soars up.

II. Classification of Iron Ore

i. Classified by ways of oxidation

a. Magnetite: a type of iron oxide with Fe_3O_4 as main component, is a compound of Fe_2O_3 and FeO. With Fe accounting for 72.4% and O accounting for 27.6%, it presents charcoal gray with relative density of 5.15. Due to its magnetic property, it can be rather convenient to be magnetically separated during mineral separation. However, due to its fine texture, it can hardly be deducted and will gradually become hematite through weathering over time.

b. Hematite: a type of iron oxide with Fe_2O_3 as main component. With Fe accounting for 70% and O accounting for 30%, it presents maroon with relative density of 5.26 and is the most common iron ore. With various texture within itself, it can also be classified into red hematite, specular hematite, micaceous hematite and red ocher, etc.

c. Limonite: an iron with ferric hydroxide. It is an umbrella name of two iron ore with different texture, goethite and XXX. Sometimes the chemical formula of limonite can be written as $mFe_2O_3 \cdot nH_2O$. With Fe accounting for 62%, O accounting for 27% and H_2O accounting for 11%, it presents yellowish brown or brown with relative density of 3.6-4.0. Most of limonite are attached to other iron ore.

d. Siderite: an iron with ferrous carbonate with $FeCO_3$ as main component. It presents

steel gray with relative density of around 3.8. Most of siderite contains a significant portion of calcium salt and magnesium salt. Since carbonate absorbs large amount of heat and releases carbon dioxide under 800 ~ 900℃, we usually tend to put it under calcination before put it into blast furnace.

ii. Classified by ways of putting into furnace

a. Lump ore: a natural ore that is not selected by manual enrichment, with the grade of about 60%. Since lump ore is raw ore, the proportion ores in blast furnace shouldn't be too high, with a ratio of around 11%.

b. Pellet: to produce a green-ball with balanced viscosity and high intensity by adding certain water and binder to ore fines. Then, to calcinate under oxidizing atmosphere after desiccation and preheating and make the green-ball cake into pellet. Pellet has good cold intensity and reducibility, and the proportion ores in blast furnace should be within the scope of 12%-15%.

c. Agglomerate: First, to add certain fuel, flux, water to various fines that contain iron element. Then, mix them together, pelletize them before putting them into sintering unit and undergoing series of physical and chemical changes, and ultimately bond mineral powder particles into lump. Agglomerate is main component in blast furnace ironmaking in China, and the proportion ores in blast furnace usually exceeds 90%.

iii. Classified by variety and grade

a. Pb Fines/ Pb Lumps: originated in Australia, also known as Pilbara Blend (operated by BHP Billiton). Pb Fines is part of limonite and has a grade of around 61.5% with good sintering character. Pb Lumps is part of limonite and has a grade of around 62.5% with good reducibility and ordinary heat intensity.

b. Mac Fines: Generally, the grade of Mac Fines is around 61.5% and in China market, the grade is around 58%. It is part of limonite with good sintering character and 5% of crystal water contained inside. It suffers high burning loss during ironmaking and the successful rate to produce agglomerate is gradually decreased.

c. Newman Fines/ Newman Lumps: originated in Newman Mines in Newman County, East Pilbara of Australia. It is part of hematite with good sintering character. The grade

of Fines is around 62.5% and the grade of Lumps is around 65%.

d. Atlas Fines: an iron ore originated in Pilbara of Australia produced by Atlas Iron company, the fourth largest iron ore producer in Australia with a grade of 57.5%. It is part of limonite with 9% crystal water and 8% of silicon contained inside.

e. SSFT Fines: a sinter fines produced by Companhia Vele do Rio Doce specially made for China market. It contains 65% of iron and 4.4% of silicon.

f. SFCJ Fines: short for Sinter Feed Carajas and is originated in Carajas Mines in Brazil. It contains over 65% of iron, 1%-2% of silicon, 1% of aluminum. 0.033%-0.045% of phosphorus and 8%-9% water with 1.6% loss during burning.

g. Indian Fines: Indian ore fines with fine particle but it doesn't meet the standard of coarse powder. With grade ranging from 40% to 63.5%, is part of hematite. The one with high grade has good smelting performance, the one with low grade contains high proportion of aluminum silicon. Therefore, Indian Fines enjoys good smelting value.

III. Relevant index of Iron Ore

There are many impurities within iron ore and they can be divided into two categories, the good ones and bad ones, according to their influence during smelting process and on product quality.

1. Bad impurities (elements): refers to impurities that influence ore dressing and smelting. The most common and major bad impurities are sulphur, phosphorus, arsenic, potassium, sodium, fluorine, etc.

a. Phosphorus: Phosphorus exits in ore as $3CaO_2P_2O_5$ or $3FeO_2As_3O_5$. In blast furnace, all phosphorus is reduced and most of it exits in raw iron. Iron and steel with much phosphorus can be crispy during low-temperature processing, a.k.a., cold shortness.

b. Sulphur: Sulphur exits in ore as FeS_2 or $FeS_2.CuS$ or $CaSO_4.2H_2O\backslash BaSO_4$. Part of sulphur is reduced and exits in raw iron. Iron and steel with sulphur can be hot shortness during hot processing. Desulfurization can be done during blast furnace smelting, however, it requires more coke (to heat up furnace) and limestone (to increase the alkalinity of slag) and the production cost is increased thereof. Therefore, the sulphur contained in iron ore to be put into furnace shall be less than 0.15%.

c. Potassium, sodium: often exits in aegirine, riebeckite and marble. The worst part of

them is to decrease the softening point of iron ore which results in the accretion in blast furnace. Iron ore with high potassium and sodium usually impede the process of blast furnace smelting.

d. Arsenic: Arsenic rarely exists in iron ore but can be seen in limonite. It exits in ore as $FeAs_2S$ or other oxide such as As_2O_3 and As_3O_5. Most of arsenic exits in raw iron during smelting. When the steel contains over 0.1% of arsenic, the steel can result in cold shortness which compromises its welding performance.

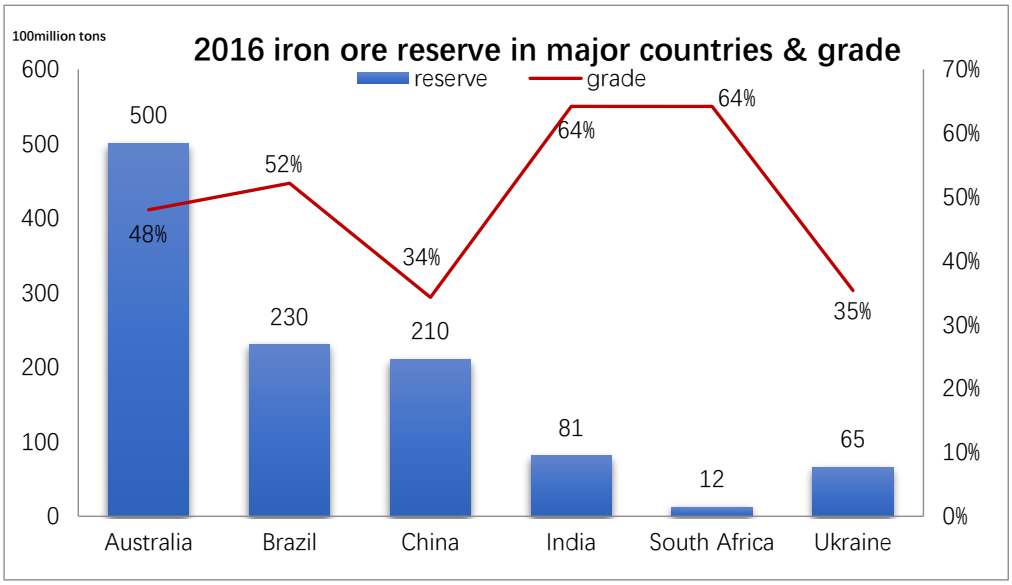
2. Beneficial elements (impurities):

Certain elements in iron ore could enhance product performance and these elements are therefore called beneficial elements. The most common elements are manganese, nickel, chromium, vanadium, titanium, etc.

Supply and Demand of Iron Ore

I. Global Iron Ore Production

The global iron ore reserve is 170 billion tons in 2016. The iron content reaches 85 billion tons till the end of 2015. Geographically speaking, places of origin of iron ore are mainly distributed in Australia, Brazil, Russia, Ukraine, China and India. The iron ore reserve in Australia is over 52 billion tons, accounting for 30% globally. The second largest reserve is in Russia, with the reserve of 25 billion tons, accounting for 14.7% globally. The third largest reserve is in Brazil, with the reserve of 23 billion tons, accounting for 13.5%. The fourth largest reserve is in China, with the reserve of 21 billion tons, accounting for 12.4%. India has the reserve of 8.1 billion tons, accounting for 4.8% globally.



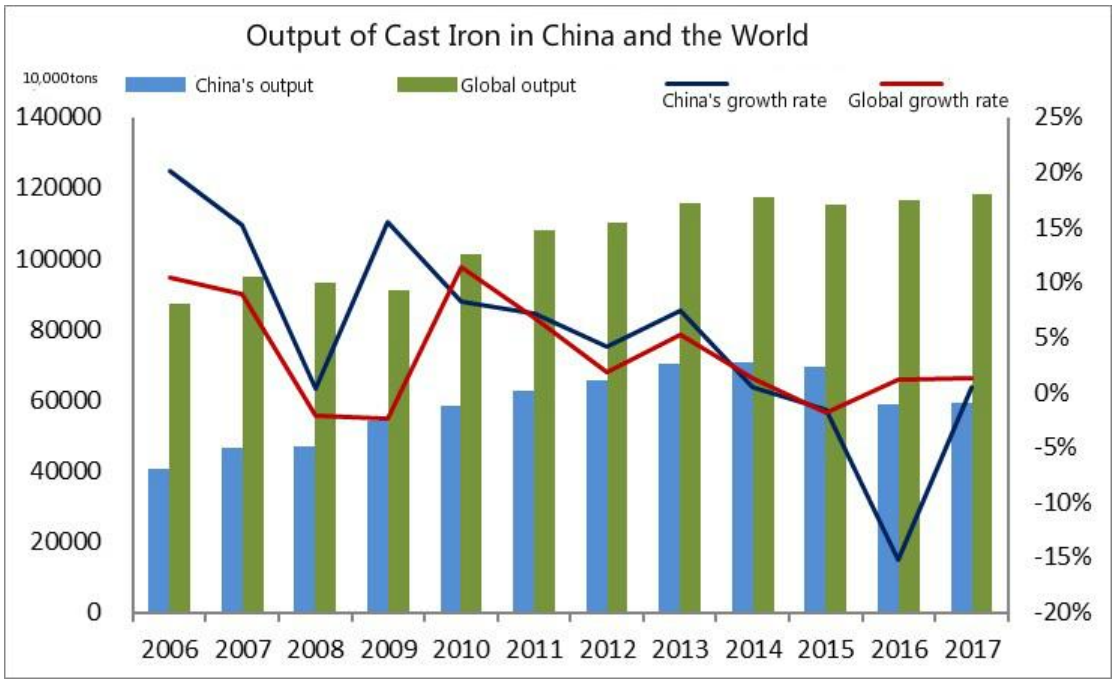
From 2002 to 2011, the global iron ore production has increased 1.05 billion tons, with an annual increase of 105 million tons and a growth rate of 8.49%. During 2003 to 2007, the annual growth rate exceeds 10%. In 2012, due to price fluctuation of iron ore, the global iron ore production has first seen a decrease since 2009, with the production output of 1.904 billion tons. Later, the production output has increased gradually and reaches 2.054 billion tons in 2014. In 2015, with the small and medium scale mines falls below the cost line and withdraw from the market, the production decreased to 2.006 billion tons. In 2016, the mineral price increased stably. With the expansion of the four largest mines and the resumption of production of small and medium scale mines, the global iron ore production increased again and reaches 2.204 billion in the year of 2017, which increased by 12.6% compared with that in the year of 2011.

The global iron ore production is relatively centralized. In terms of countries, Australia, Brazil are the largest iron ore production country around the word. India and Russia are the next. The first ten largest iron ore production countries generate an output of over 80% globally, Australia and Brazil among which accounts of over 60% and the market is further centralized. In terms of mines, Vale in Brazil, RIO Tinto, BHP and FMG in Australia controls the global iron ore supply. The production output of the first four largest mines in 2017 reaches 1.17 billion tons, accounting for 53.95% of global iron ore production output, which occupies 72.8% of world import volume. Vale production output reaches 367 million tons, RIO Tinto reaches 268 million tons, FMG reaches 191

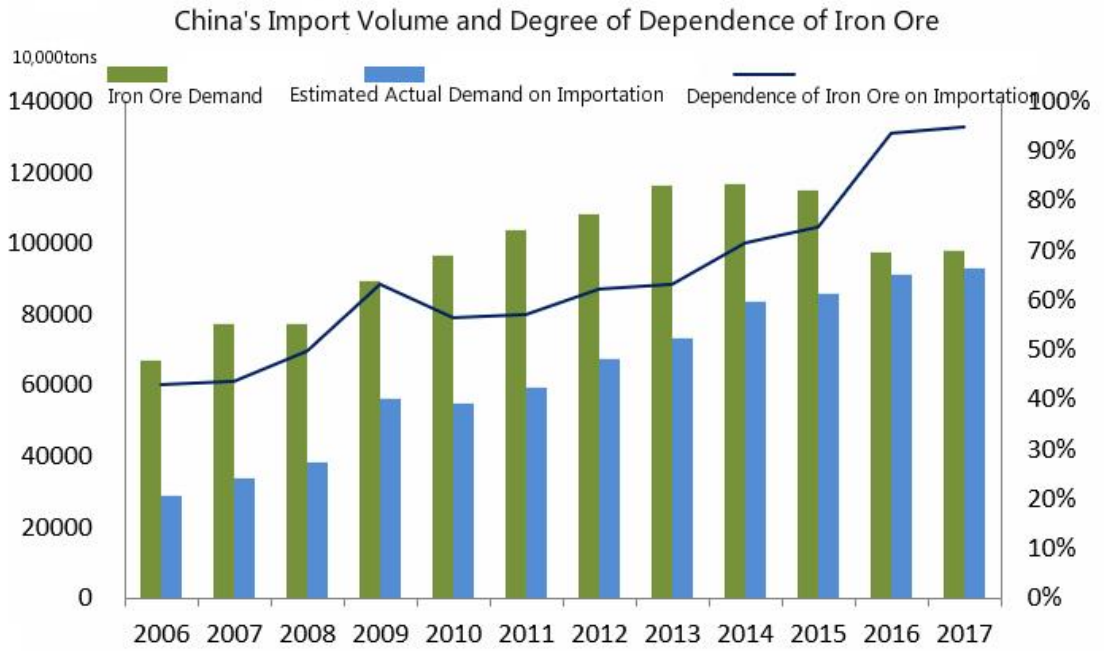
million tons, accounting for 16.84, 16.02%, 12.3% and 8.79% respectively.

II. Global Iron Ore Demand

Since iron ore is mainly used in cast iron smelting, therefore, we tend to estimate the iron ore demand by the output of cast iron. During 2010 to 2017, global blast furnace cast iron output increased by 16.55%. All these years have witnessed a growing trend except the year of 2015, which decreased by 1.83% on year-on-year basis. In 2017, the output reaches 1.18 billion tons. China is a major iron ore demanding country. From 2010 to 2017, the output of cast iron in China accounts for over 58% globally, and the output in the year of 2017 accounts for 60.25%. The output of cast iron in Japan accounts for 6.64%, and the one in India accounts for 5.59%. The one in Russia and South Korea accounts for 4.41% and 3.96% respectively. In terms of cast iron output, Asia is still the major demanding region of iron ore, accounting for 80% globally. Europe ranks the second, accounting for 7.95%. North America and South America accounts for 2.79% and 2.67%, respectively.



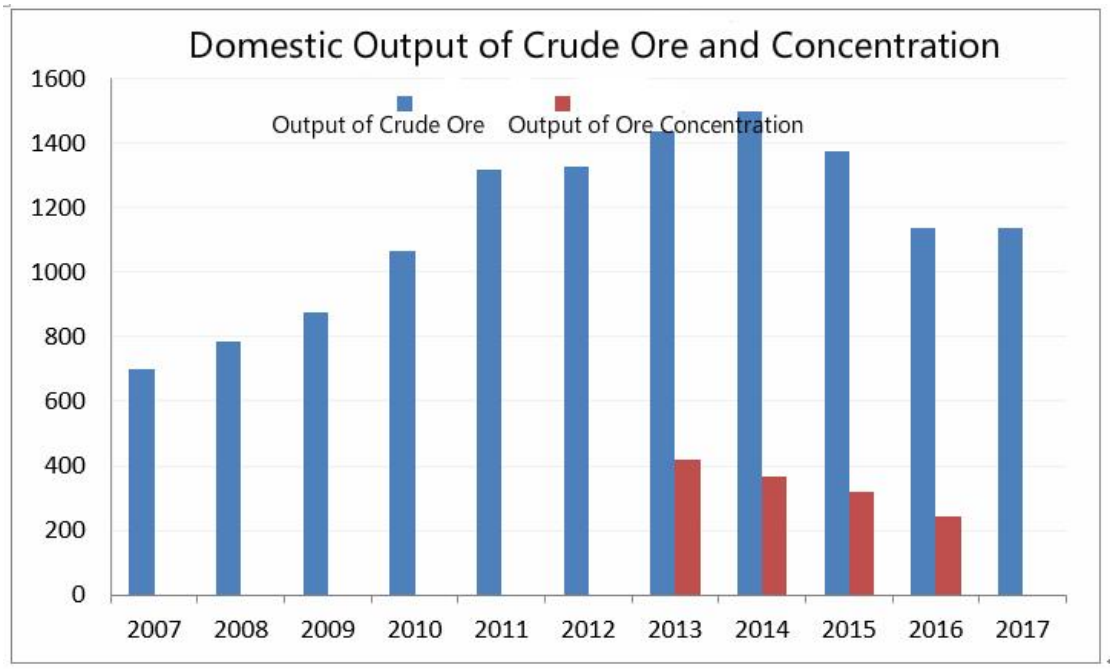
In terms of demand, different countries have various sources of import. Japan has a 99% degree of dependence on import, 61% of which is from Australia, 21% from Brazil. South Korea and many European countries has a 100% degree of dependence on import, and they mainly import from Australia and Brazil. America's degree of dependence is 50%. Russia, Ukraine, Brazil, Australia, South Africa and India can produce its own iron ore. China, however, is not resourceful in iron ore, besides, the mining cost is too high, and the supply is outpaced by demand, therefore, China mainly relies on import in terms of iron ore. By the year of 2017, the degree of dependence on import rose to 90%, and still has the momentum to rise.



The import volume is similar to the export volume in terms of global iron ore. From 2010 to 2016, the import volume increased by 42.3% with average annual growth rate of 5.89%. The export and import volume is estimated to be 1.617 billion tons and 1.675 billion tons, respectively. China's import volume of iron ore ranks the top globally, accounting for 40.6% in 2010 and 67.2% in 2016. Japan and South Korea follows, accounting for about 8% and 4%, respectively.

III. China Iron Ore Production

Though China's reserve of iron ore ranks at the forefront around the world, yet the output of finished mining products is relatively low due to the poor resource endowment, not to mention the regulatory steps taken to protect environment, the output of crude ore and concentration started to plummet thereafter. The output of crude ore was 218 million tons back in 2011, and the number rose to 1.38 billion tons in 2015 after which the number went down though the price of iron ore started to gradually rise in 2016 and 2017, reached 1.28 billion tons and 1.23 billion tons, respectively. The grade of crude ore ranges from 25% to 35%, so the output of finished mining products plummet after selection. According to Bloomberg, the output of finished mining products reached 445 million tons in 2013 and decreased to 233 million tons in 2017 and is estimated to continue to decrease.



Bohai Rim region generates the most output of iron ore. The output in Hebei province and Liaoning province accounts for 60% across the country. If we take account of Shanxi province and Inner Mongolia which is not far from Bohai Rim region, the whole area generates about 65% of iron ore output across China. Specifically speaking, all regions conduct mining except Tianjin, Tibet, Shanghai, Ningxia which are restricted of production due to resource limit. In 2017, Hebei, Sichuan generated the most output of iron ore, which were 580 million tons and 140 million tons, respectively. Liaoning, Shanxi, Anhui follow, which were 120 million tons, 66 million tons and 37 million tons, respectively.

IV. China Iron Ore Demand

After 2000, with the investment in infrastructure and rapid development of real estate industry, the demand for steel grows rapidly, so does the demand for the iron ore. The demand for iron ore in China reached 230 million tons in 2001 (calculated by the production output of cast iron), 750 million tons in 2008, with an increase of 225%. In 2014, the demand hit a new high at 1.13 billion tons. Later, with the transformation of China's economic pattern, the demand for steel decreased gradually. In 2017, the demand for iron ore decreased to 950 million tons. With the cut of steel capacity, and frequently supervision of environmental agencies, the output of cast iron decreased

again in China, and is estimated to continue to drop gradually.

Bohai Rim region has the most demand for iron ore. Hebei province, Shandong province and Liaoning province produce 43% of the cast iron output in China. Jiangsu produce 70 million tons of cast iron. The first seven districts in terms of cast iron output accounts for about 67% of the total output in China, the demand is relatively centralized.

V. World Iron Ore Trade

Over 90% of global iron ore trade is through sea transportation. The volume was 900 million tons in 2012, accounting for 93.8% of all trade volume.

The route between Australia and China is from port in Western Australia to Shandong port, usually in Qingdao. It usually takes 15 days by sea transportation. Australia is the nearest supplier for China. The route from between Brazil and China is from Tubarao port in Brazil to Shandong port. It usually takes over 40 days by sea transportation. So Australia has better advantage for China both in time and transportation. Therefore, about 80% of Australia ores are exported to China and 55% of Brazil ores are exported to China.

China's iron ore importation volume was 92.39 million tons in 2001, an year-on-year increase of 32%. In 2002, the importation volume of iron ore hit 100 million tons, 10.1 times bigger than the volume in 2001. In 2017, the volume hit a new high at 1.07 billion tons.

Since 2012, the importation volume of iron ore keeps accounting for over 80% in China. 65% was imported from Australia and Brazil. Later, with the price plummeted, non-mainstream iron withdrew from market. So the proportion continues to grow and reached 83% in 2017.

In terms of customs clearance, over 50% iron ore declared customs at Bohai Rim region, indicating the area to be the major entrance for iron ore. At the same time, the imported iron ore is also unloaded at the region. From 2013 to 2017, over 15% of iron ore are imported from other countries to Hebei, Shandong, Jiangsu province. The first five provinces with the most importation volume accounts for 65% of domestic importation volume.

Evolution of Iron Ore Pricing Mechanisms

Before 1950, iron ore was mainly spot traded.

Early in 1960, iron ore was traded by short-term contract.

Since 1960s, long-term contract appeared.

In 1975, iron ore exportation association was established and long-term contract was changed into short-term contract.

Long-term negotiation mechanism was found and applied for 30 years since 1980. The mines and steel plant negotiate with each other and set up the price of iron ore for the financial year. Later, any part of iron ore demand side will negotiate with any supply side before they reach census which both sides agree and accept this price for their upcoming financial year. Over the last two decades from 1980 to 2001, Japan dominated the price for global iron ore. Since 2004, China became the top buyer of iron ore on the global market. The price soared up thereafter. Though the representatives from Baoshan iron and steel plant participated the annual long-term negotiation as Chinese enterprise yet the result is far from satisfactory. The price of iron ore keeps going up.

The sea transportation fee soared up in 2008 and the spot trade price is much higher than the one set up by long-term negotiation mechanism, therefore, all corporate giants in the industry started to seek the best way of pricing. Later, few steel plants in China implement long-term negotiation mechanism and the mechanism finally broke up.

In March, 2010, Vale of Brazil first announced to change its annual benchmark pricing mechanism to seasonal benchmark pricing mechanism. Rio Tinto and BHP Billiton followed and made the same change. Annual benchmark pricing mechanism, which was applied for over 30 years, collapsed and seasonal benchmark pricing mechanism was applied. Within less than two quaters, BHP Billiton used the new pricing method, which is monthly benchmark pricing mechanism. In June, 2011, Rio Tinto stopped using seasonal pricing mechanism and adopted pricing strategy which is more flexible, such as seasonal, monthly or even daily pricing strategy. At this point, the long-term negotiation mechanism for iron ore stepped down from historical arena and short-term pricing mechanism for iron ore prevails.

In April, 2010, three mining giants announced index pricing mechanism, which means steel mill and mines agrees to determine the next quarter price of iron ore in the long-

term contract according to the average index price of the previous three months. The index was released by third-party consultancy. Starting from 2010, the three mining giants changed the iron ore price for each month or each quarter accordingly by the index pricing mechanism and the index mainly reflects the price trend in the spot market. Nowadays, there are TSI index, Platts index, Metal Bulletin MBIO index, etc. Platts index was the widely used and is now the mainstream pricing standard.

Chart: 1991-2009 results of long-term negotiation mechanism for iron ore

Year	Asian Market			European Market		
	Price date	Price enterprise	Price limit%	Price date	Price enterprise	Price limit%
1991	1991-1-30	hamersley	7.93	1991-1-13	CVRD-TKS	7.95
1992	1991-12-17	hamersley	-4.9	1991-12-17	CVRD-TKS	-4.9
1993	1993-1-13	BHP-Japan	-11	1992-12-22	SNIM-Usinor	-13.47
1994	1994-2-8	Hamersley	-9.5	1994-2-8	Hamrsley-TKS	-6.77
1995	1994-12-20	BHPIO	5.8	1994-12-20	SNIM-Usinor	5.8
1996	1996-1-25	BHPIO	6	1997-1-29	CVRD-TKS	6
1997	1997-1-21	BHPIO	1.1	1997-1-29	Hamrsley-Corus	-1.94
1998	1998-1-21	BHPIO	2.82	1998-1-22	CVRD-TKS	2.82
1999	1999-2-16	Hamersley	-11	1999-2-19	CVRD-TKS	-11
2000	2000-2-29	Robe river	4.35	2000-2-27	SNIM-Usinor	5.42
2001	2001-3-26	Hamersley	4.3	2001-3-20	CVRD-Riva	4.31
2002	2002-5-31	Bhpb.hamersley	-2.4	2002-5-29	CVRD-TKS	-2.4
2003	2003-3-21	Hamersley/BHP-Nippon Steel	8.9	2003-5-19	CVRD-Arcelor	8.9
2004	2004-1-14	Hamersley-Nippon Steel	18.62	2004-1-13	CVRD-Arcelor	18.62
2005	2005-2-22	CVRD-Nippon Steel	71.5	2005-3-3	CVRD-Arcelor	71.5

2006	2005-6-17	CVRD-JFE	19	2006-5-15	CVRD-TKS	19
2007	2006-12-21	CVRD-Baosteel	9.5	2006-12-27	CVRD-Riva	9.5
2008	2008-2-18	VALE- Nippon Steel	65	2008-2-19	VALE-TKS	65
2009	2009-5-26	Rio Tinto- Nippon Steel	-32.95			

General Introduction to Iron Ore Derivatives Market

Nowadays, the following exchange has iron ore for transaction, such as SGX, CME, HKEX and DCE. The trading of iron ore in DCE is the most active with daily average trading volume of 2 million deals. The second most active exchange is SGX iron ore swap. CME and HKEX, however, are not as active in iron ore trading as the previous two exchanges. Following are brief introductions to iron ore derivatives for three overseas exchanges.

I. CME Iron Ore Swap

In June, 2010, CME also engaged in iron ore swap trade and clearing. Three futures swaps related to iron ore were launched and all were based on global main price index of iron ore. Platts index swap futures was based on Platts iron ore monthly average price index. As for the methods for delivery, CME uses cash delivery and it adds transportation fee to China and cost as basis which is in line with international standard in contract designing. Besides, iron ore futures contract was traded on Globex so that all traders across the world can participate. However, it is not good for Chinese buyers to engage spot hedging, which affects Chinese steel mill's willingness to participate the trading to some extent. The last trading day for iron ore futures in CME is the last working day of the contract month. However, working day is defined by American public holiday calendar. Therefore, if the last working day happens to be the holiday of exchanges, the last trading day will be made one day earlier. In terms of trading time, iron ore futures trading in CME will be made by both Globex and open outcry alternatively, which make the trading time longer and continuous. It almost covers 24 hours per day, which avoids the risks of open sharply low or high. The contract size of iron ore futures in CME is 500 tons per hand and the minimum price change is 0.01

USD/ton. The contract covers the same year, and the following two calendar year with no price limit.

Chart: CME iron ore futures contract

Contract Size	500 Metric Tons	
Quotation	US Dollar and Cent	
Trading Hours	CME Globex Electronic Trading	From Sunday to Friday, 6:00 pm to 5:00 pm (5:00 pm to 4:00 pm based on Chicago time). Market will suspend for 60 minutes starting from every 5:00 pm.
	CME ClearPort	From Sunday to Friday, 6:00 pm to 5:00 pm (5:00 pm to 4:00 pm based on Chicago time). Market will suspend for 60 minutes starting from every 5:00 pm.
Minimum Price Change	0.01 US dollar per metric ton	
Product Code	CME Globex Electronic Trading: TIO	
	CME ClearPort: TIO	
	Clearing: TIO	
Trading Contract	Monthly contract for current year and three calendar years followed. Monthly contract will be traded if the contract of last december is terminated to trade.	
Ways of Settlement	financial settlement	
Floating Prices	Floating prices for each contract month are average prices calculated by assessment of all existing prices released by "Iron Ore Fines 62% Fe-CFR Port of China"	
Trading Termination	based on public holiday calendar of Singapore. If the last business day is Bank Holiday of Sinapore, than the lasting trading day will be the business day prior to the holiday.	
Positions Limit	NYMEX positions limit	
Rules and Regulations of Exchange	NYMEX 919	
Minimum Quota for Bulk Commodities	Lowest Threshold for Bulk Commodities	
Quotation Code for Suppliers	Quotation code list for suppliers	

II. SGX Iron Ore Swap

In April, 2009, SGX launched OTC clearing service of iron ore swap contract based on TSI index. Daily settlement price was used to evaluate the contract value. Final settlement price is set the same as TSI price, which is the average TSI index price of the final contract month. The swap trading duration could be set as month, quarter or

year, and will be settled on a monthly basis. The longest duration is 36 months, i.e. 3 years. The active month lies in the sixth to eighth month and seasonal contract is relatively active with regular trading volume reaching 5,000 tons or 10 hands per month.

Chart: SGX iron ore swap contract

Product	Iron Ore Swap
Contract	CFR China Iron Ore (62% Iron Ore Powders) Swap
Contract Size	One hand = 500 mt
Ticker Symbol	FE
Minimum Price Fluctuation	US$0.01/mt
	Per Price Fluctuation = US$0.01*500mt=US$5.00
Contract Months	Up to 4 calendar years starting with current year, with 12 consecutive months added upon expiry in December.
Trading Hour (Singapore Time)	8:00 am to 4:00 am
	Last trading day: 8:00 am to 8:00 pm
	notes: The system is suspended from 4:00:01 am to 7:59:59 am
Last Trading Day	Last release date of TSI iron ore reference price in contract month
Final Settlement Price	Cash settlement using the arithmetic average of all The Steel Index (TSI) iron ore reference prices in the expiring month, rounded to 2 decimal places. (www.thesteelindex.com)
Settlement Fee	US$12 per hand (www.sgx.com/asiaclear/commodities)

III. HKEX Iron Ore Futures

In November, 2011, HKEX introduced TSI CFR China iron ore 62% iron powder futures which is settled in cash. It is the first seasonal contract product around the world which is traded on exchange. This means that market participants can execute buy or sell order in order to hedge its seasonal holding positions. The trading time starts at 9:00 a.m. till 1:00 a.m. （9:00-16：30；17：15-1：00）which covers operation time of mainland China and major overseas market and provide convenience for market participants. Iron ore futures contract has block trade mechanism which is convenient for OTC participants to settle in exchange and reduce the risk for both sides.

Chart: HKEX iron ore swap contract

TSI CFR China Iron Ore 62% Iron Fines Futures Contract		
Contents	Monthly Contract	Quarterly Contract
Minimum Fluctuation	USD 0.01 per tonne	
Underlying	TSI Iron Ore Fines 62% Fe CFR China Index	
Settlement Method	Cash settled	
Contract Months	Spot Month and the next 23 calendar months	Spot Quarter and the next seven calendar quarters (i.e. calendar quarters are January to March, April to June, July to September and October to December)
Trading Hours (Hong Kong Time)	9:00 a.m. to 4:30 p.m. (day trading session) and 5:15 p.m. to 1:00 a.m. (after-hours trading session) 5:15 p.m. – 6:30 p.m. (after-hours trading session)	
Last Trading Day	The last Hong Kong Business Day of a calendar month that is not a Singapore public holiday	The Last Trading Day of the last Monthly Contract in the calendar quarter
Final Settlement Price	Arithmetic average of all TSI Iron Ore Fines 62% Fe CFR China Index values published in that Contract Month, rounded to 2 decimal places	Arithmetic average of the Final Settlement Prices of the three corresponding Monthly Contracts in that Contract Quarter, rounded to 2 decimal places
Final Settlement Day	The second Hong Kong Business Day after the Last Trading Day.	
Trading Fee (per contract per side)	USD 1.00	
Settlement Fee (per contract per side)	USD 1.00	
Levies (per contract per side)	USD 0.07	
minimum trading volume of block trade	at least 50 contracts	
Holiday Schedule	Follow HKFE holiday schedule	

Iron ore futures in CME and SGX is swap transaction. The main participants are exchanges, clearing members, brokers and traders. Since swap contract is non-public OTC market, it requires high standard of investors, the main trading body is professional investors instead of retail investors. Due to the same reason, the international market has high recognition to the iron ore price made by SGX. DCE, on the hand, could make the price more authoritative by introducing international investors and large-size of trading volume.

DCE Rules and Regulations of International Trade of Iron Ore

I. General Introduction and Interpretation of Contract

a. Business Operation

From October 18th, 2013, its opening day, to 2017, the trading volume of iron ore futures in DCE rose from average 94,700 hands in the first month to average 2.4024 million hands in the last month of 2017, an increase of 24 times and the holding positions was rose from 102,600 hands to 1.5997 million hands, an increase of 15 times, becoming the largest iron ore futures around the world in terms of both trading volume and holding positions. Since DCE came into market, its price discovery ability gets stronger and stronger and the price is closely related to spot market. From 2014 to 2017, the correlation coefficient between closing price of dominant contract and 62% PB fines in

Qingdao port lies within 0.93 to 0.97. With the active participation of enterprises dealing spot goods, the futures price can serve as guidance for spot price. According to statistics from DCE, there are about 12,000 corporate clients who engage in iron ore futures trade including 88 steel enterprises, 717 traders and 10 domestic mine enterprises, generating a total of 4.86 million tons of iron ore by far.

b. Major participants and trading strategy

Domestic iron ore traders mainly consist of industrial clients, such as steel mill, mines, traders, and other investment institutions and small and medium sized retail investors. Unlike SGX, most traders in DCE are retail investors looking for speculation. However, with the introduction of overseas traders and constant improvement of relative mechanism, the main participants are estimated to be optimized and will feature the function of price discovery. Regarding trading strategy, industrial clients mainly trade by taking account of both futures and spot goods in order to achieve hedging and basis trading. When forward contract discounts, steel mill could buy the contract and establish a virtual stock. When the trader predicts the price will go down, it can sell the contract in order to lock the profit when dealing with spot goods. When engaging in basis trading, two sides don't set the price immediately. Instead, they will set the basis according to the futures price and set the final price by adding futures price at the purchase month and basis together, transferring the risk of spot goods price fluctuation to futures market. When the contract is made, the trader will seek for hedging on the futures market and close up positions after the goods are sold. The buyer, steel mill, will be able to make the price more freely. Besides, since 60% of trade objects in DCE are mines with medium or high grade, and 55% on spot markets are mines with low grade, therefore, if the spot trader thinks the price between high and low will narrow, he can sell the futures contract and buy the low grade mines in order to achieve arbitrage and vice versa.

Institutional investors have more flexible ways of trading, including unilateral speculation, calendar spread arbitrage, cross commodity arbitrage, cross market arbitrage, etc. The active contracts for iron ore are 1, 5 and 9. Therefore, cross market arbitrage happens within these three contracts. Cross commodity arbitrage happens

within deformed steel bar, hot rolled coils, coke and iron ore, including steel mill profit arbitrage which trades between various commodities. Cross market happens between iron ore futures in DCE and SGX. However, ordinary investors found hard to participate since the trade is too complex itself and harsh requirement for engaging business in SGX.

c. Interpretations of the contract

In October, 2013, DCE introduced iron ore futures, and its corresponding trading object is ore fines with 62% grade, becoming the first iron ore futures that is settled in delivery.

Chart: DCE iron ore futures standard contract

Product	Iron Ore
Trading Unit	100 MT/Contract
Price Quote	CNY/MT
Tick Size	0.5 CNY/MT
Daily Price Limit	4% of last settlement price
Contract Months	Monthly contracts (12 contracts per year)
Trading Hours	9:00 - 11:30 am, 13:30 - 15:00 pm Beijing Time, Monday - Friday, with extended hours trading session from 21:00 to 23:30 pm, and other trading hours announced by DCE
Last Trading Day	10th trading day of the delivery month
Last Delivery Day	3rd trading day after the last trading day
Deliverable Grades	In accordance with DCE Iron Ore Delivery Quality Standard
Delivery Location	The warehouses and delivery locations designated by DCE
Minimum Trading Margin	5% of the contract value
Delivery Form	Physical delivery
Ticker Symbol	I
Exchange	Dalian Commodity Exchange

i. Margins Standard

DCE has different margins standard at different stages and will change the standard according to trading status on the market.

Chart: DCE minimum trading margin of iron ore futures

Trading period	Iron ore trading margin
Starting from the contract date	5% of contract value
Fifth trading day of the month prior to delivery month	10% of contract value
First trading day of the delivery month	20% of contract value

ii. Price Limit

When iron ore futures contract undergoes continuous up limit or down limit, the exchange can raise the price limit and margin standard as follows,

Chart: DCE iron ore futures up and down price limit

	First trading halt	Second trading halt	Third trading halt
Price limit	P	P+3%	P+5%
Trading margin standard	M	M1=Max[M,P+5%]	Max[M1,P+7%]

When the N+2 trading day encounters the price limit with no continuous new offer and the same direction as the N+1 trading day, if the N+2 trading day is the last trading day, the contract will end in delivery directly. If the N+3 trading day is the last trading day, the N+3 trading day will continue to trade, with the price limit and margin standard the same as that of N+2 trading day. Otherwise, the exchange could take one of the following two measures,

a. at the N+3 trading day, the exchange could raise the trading margin on one side or both side, in the same proportion or different proportion, for part member or all member, and suspend opening new positions for part member or all members, and adjust the price limit, limit the withdraw of capital and close out the positions before deadline, or mandatory liquidate the positions.

b. mandatorily reduces positions when the market closed at the N+2 trading day.

iii. price quotation unit and contract value

Iron ore futures is traded in CNY. The minimum price quotation unit is 0.5CNY per ton. Each hand represents 100 tons, which means the unit value is 50 CNY.

iv. trading time

The trading time for iron ore futures is from 9:00 am to 11:30am, from13:30 pm to 15:00, from 21:00 pm to 23:30 pm.

II. Overseas Brokerage Register and Filing Procedure

i. Filing procedure

1. Futures company and overseas brokerage institution sign agreement of authorization

2. Futures company submits written materials to exchange

3. Exchange send filing confirmation letter to futures company after verifying the materials

4. Futures company fill out application and the exchange examine and approve.

ii. Register procedure

1. Futures company submit register application through monitoring center

2. Monitoring center review and provide feedback

3. Futures company send relevant information to overseas brokerage institution

iii. materials required

Materials required	Notes
1.Filing statement signed by authorized signatory, filing application for overseas brokerage institution	
2.Passport or any other copy of ID identification, resume and signature card of representatives of overseas brokerage institution and risk management manager of futures business approved by DCE	
3.Materials which is notarized and approved legally of the founding of overseas brokerage institution	
4. Credentials indicating overseas brokerage institution has the right to engage brokerage business	
5. Regulations of authorization of futures company, regulations of internal control, regulations of risk management	After first filing, the futures company no longer needs the provide the material
6.Letter of commitment	
7.Credentials indicating the net capital of overseas brokerage institution is over 30 million CNY or equivalent, credentials indicating the institution has been running for over a year continuously	

8. Authorization agreement to be signed between overseas brokerage institution and futures company member	
9. Letter of authorization of the person indicating the person is authorized to sign	
10. Other materials DCE or the applicants deem necessary to provide	
11. equivalent filing materials	Procedures can be simplified if has been filed in other exchanges.
12. electronic CD-ROM of application materials, including all above-mentioned written and electronic application materials	Written materials prevail if there's difference between written and electronic application materials

III. Suitability and Account Opening Rules and Regulations

i. Suitability regulations for traders

1. Scope of application: applied to domestic and overseas clients who open new account after March 27th, 2018.

2. Access requirement

a. available capital: balance no less than 100,000 CNY or equivalent foreign currency in five trading days before application. (formula: foreign currency amount*central parity rate of foreign exchange against RMB on the day released by China Foreign Exchange Trade System Foreign exchange discount rate)

b. knowledge test: participate the online test through the platform of China Futures Association, and the score shall be no lower than 80.

c. trade experience: has futures trade record in China or overseas within the past three years (China: Futures trading statement by Futures company; Overseas: details of futures trading record, document of settlement or other proof)

d. Legal compliance and integrity requirement: no bad integrity record, not banned from entering futures market by authority, not banned from or limited to engage in futures trade.

ii. Account opening procedure and required materials

1. Account opening procedure

· Direct account opening mode

Step1: Overseas submit ID documents and suitability materials and fill out materials for account opening.

Step2: Futures company examine and review materials for account opening and suitability materials and apply for trading code through monitoring center.

Step3: Monitoring center examine and review materials for account opening and will send to exchange once the materials are verified.

Step4: Exchange examine and review materials for account opening and will send trading code to futures company through monitoring center once the materials are verified.

Step5: Futures company set up trading authority.

Only set up iron ore trading authority for overseas clients.

Review of suitability requirement:

Classify clients and match of suitability according to Clients' Guide to Futures Brokerage Contract made by China Futures Association

To conduct knowledge test for clients, to review the available capital, trade experience and legal compliance and integrity according to Suitability Management Regulation made by DCE

· sub-delegation account opening mode

Step1: Overseas clients submit ID documents and suitability materials and fill out materials for account opening.

Step2: Overseas brokerage institutions examine and review materials for account opening and suitability materials and apply for trading code through monitoring center.

Step3: Monitoring center examine and review materials for account opening and will send to entrusted futures company for review. The futures company send these materials to exchange once these materials are verified.

Step4: Exchange examine and review materials for account opening and suitability documents and will send trading code to futures company and overseas brokerage

institution through monitoring center once the materials are verified.

Step5: Futures company set up trading authority.

Only set up iron ore trading authority for overseas clients.

Review suitability requirement:

To conduct knowledge test for clients, to review the available capital, trade experience and legal compliance and integrity and to sign the proof of the clients meeting the requirement of suitability in dealing specific products.

2. Required materials for account opening

Account opening for overseas institutions

Type of materials	Materials for submission or reserve	Notes
Materials to be submitted by account opening institution to monitoring center	Scan copy of business registration certificate	
	Scan copy of tax payment certificate	
	proof of the clients meeting the requirement of suitability in dealing specific products	Required for sub-delegation account opening
	Chinese translation of trade code application form	All institutions shall submit except for institutions in Taiwan
	Scan copy of power of attorney	
	Full face photo of account opening agent	
	Scan copy of identification paper of account opening agent	
	Full face photo of executive director or legal representative	
Materials to be reserved by account opening institution	Scan copy of valid identification paper of executive director or legal representative	
	Scan copy of referential ID documents of executive directors or legal representative	
	Original copy of trading code application form and copy of all above-mentioned documents	
	Transcript of client's knowledge test	

	Proof of client's past trade experience	
	Proof of available balance in client's margin account	
	Proof that client has regulations of internal control, risk management, information reporting	
	Proof that demonstrates client's legal compliance and integrity	
	Other proof materials of suitability	

Account opening for overseas individuals

Type of materials	Materials for submission or reserve	Notes
Materials to be submitted by account opening institution to monitoring center	Scan copy of personal page in the passport	
	Scan copy of driving license	Provide at least one of them
	Scan copy of social security certificate	
	Scan copy of tax payment certificate	
	Copy of front and back side of local ID card	
	其他参考证件扫描件	
	proof of the clients meeting the requirement of suitability in dealing specific products	Required for sub-delegation account opening
	Chinese translation of trade code application form	
Materials to be reserved by account opening institution	Full face photo of trader	
	Original copy of trading code application form and copy of all above-mentioned materials	
	Transcript of client's knowledge test	
	Proof of client's past trade experience	
	Proof of available balance in client's margin account	
	Other proof materials of suitability	

Account opening for individuals from Hong Kong, Macao and Taiwan

Type of materials	Materials for submission or reserve	Notes
Materials to be submitted by account opening institution to monitoring center	Scan copy of back side of permanent ID card of HK and Macao or Mainland Travel Permit for Taiwan Residents	
	Scan copy of driving license	Provide at least one of them
	Scan copy of social security certificate	
	Scan copy of tax payment certificate	
	Scan copy of front and back side of Mainland Travel Permit for Hong Kong and Macau Resident or ID card for Taiwan residents	
	Scan copy of other referential documents	
	proof of the clients meeting the requirement of suitability in dealing specific products	Required for sub-delegation account opening
	Chinese translation of trade code application form	Required for individual trader from Hong Kong and Macao
Materials to be reserved by account opening institution	Full face photo of trader	
	Original copy of trading code application form and copy of all above-mentioned materials	
	Transcript of client's knowledge test	
	Proof of client's past trade experience	
	Proof of available balance in client's margin account	
	Other proof materials of suitability	

iii. Procedures for hedging, arbitrage

1. Hedging: Clients from overseas brokerage institution shall authorize the overseas brokerage institution to apply for hedging before overseas brokerage institution authorize the futures company member to apply.

2. Arbitrage: Clients from overseas brokerage institution shall authorize the overseas brokerage institution to apply for position limits of arbitrage before overseas brokerage institution authorize the futures company member to apply.

IV. Settlement Rules and Regulations

i. main trading body

a. clients: overseas trader, overseas economic institutions

b. settlement member: 148 futures company members, 16 non-futures company members

c. exchange

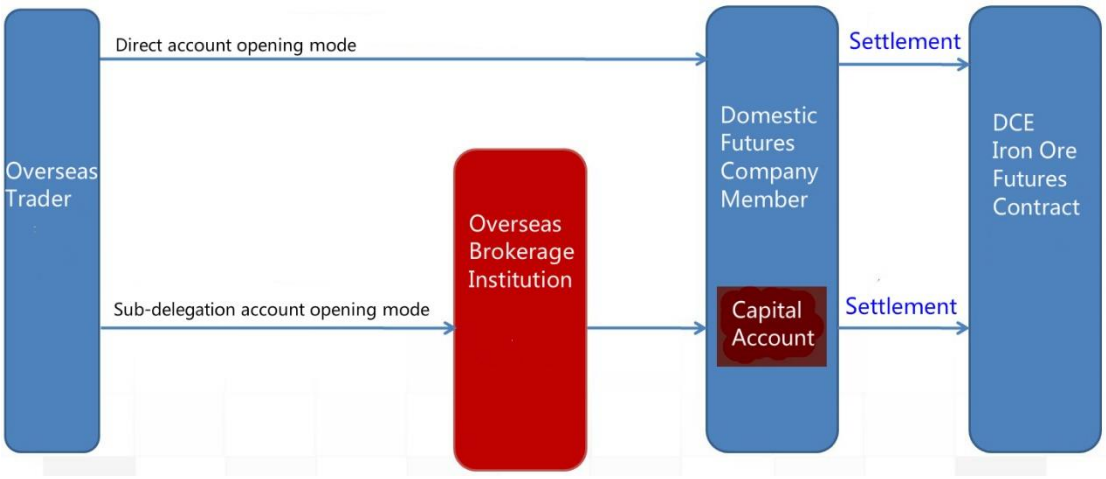
ii. requirements of depository bank

a. depository qualification: domestic clients, overseas clients

b. business and system: standards of storage and management for specific product, NRA account management, cross-border fund transfer, bank-option capital system, foreign exchange settlement and sale system and data submission.

c. regulatory filings: performance of obligation of anti-money laundering and anti-terrorist financing, authenticity, review of legal compliance, submission account information to RCPMIS, cross-border RMB cash receipts information, declaration of international receipts and payments, data submission of relevant account and foreign exchange settlement and sale, etc.

iii. settlement and authorization



iv. basic regulations of settlement

1. Margins

Margins consist of settlement balance deposit and trading margins. Settlement balance deposit are funds deposited in special settlement account in exchange before the member makes transactions. It is margins that are not occupied by contract. Trading

margins are funds in special settlement account in exchange that is used to make sure that the contract can be executed. It is margins that are occupied by contract. The following entities can be traded as margins: CNY, USD, standard warehouse receipt.

2. Marking-to-Market

After the end of daily trading, the exchange shall calculate the profit and loss of all contracts, the trading margins and commissions, and collect the one-off payment available, to add or reduce settlement balance deposit accordingly. Settlement price of futures contract is calculated by average futures contract transaction price weighted by trade volume.

3. Provision of risk

Provision of risk is established by exchange, with the aim to maintain the standard operation of futures market by providing financial guarantee and make up for the loss that is caused by unpredictable risks.

Sources of risk provisions:

a. 20% of commissions collected by exchange

b. other sources of income that comply with national fiscal policy

v. basic principles of settlement

1. calculated in CNY

2. foreign exchange as margins

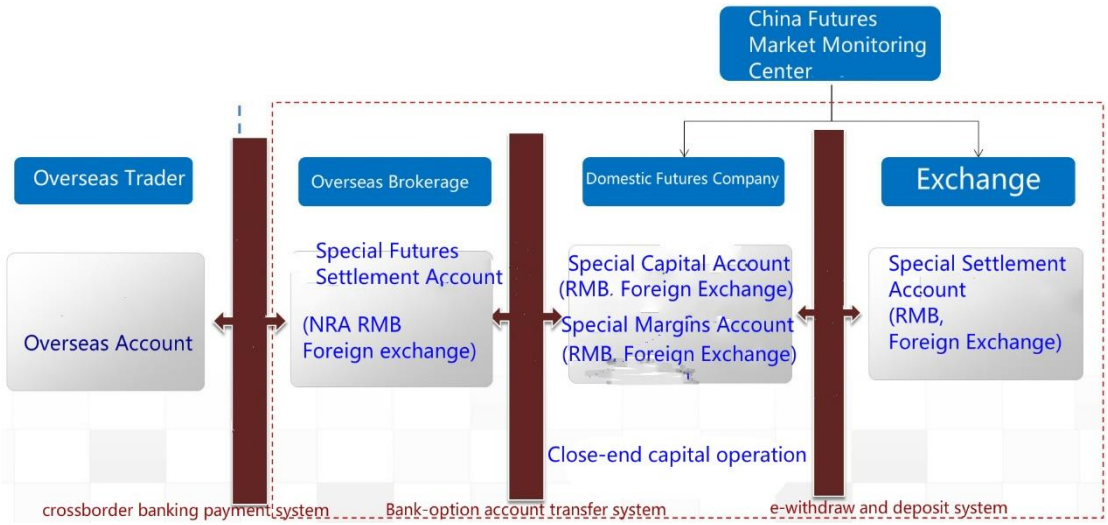
3. allow settlement of exchange of certain capital

vi. system transformation of settlement business

exchange	• CNY special settlement account • Foreign exchange settlement account
Futures company member	• CNY margins special account • Foreign exchange margins special account • CNY futures special capital account • Foreign exchange futures special capital account
Overseas brokerage institution	• NRACNY special futures settlement account • NRA foreign exchange special futures settlement account
Overseas trader	• NRA CNY special futures settlement account • NRA foreign exchange futures settlement account

vii. daily settlement business of futures company

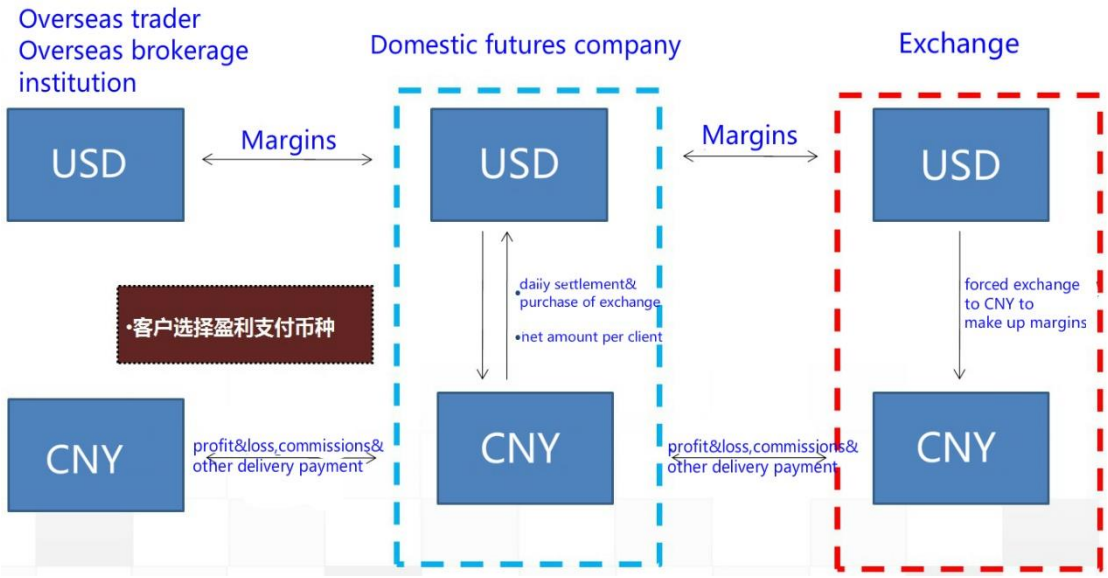
1. fund transfer business:



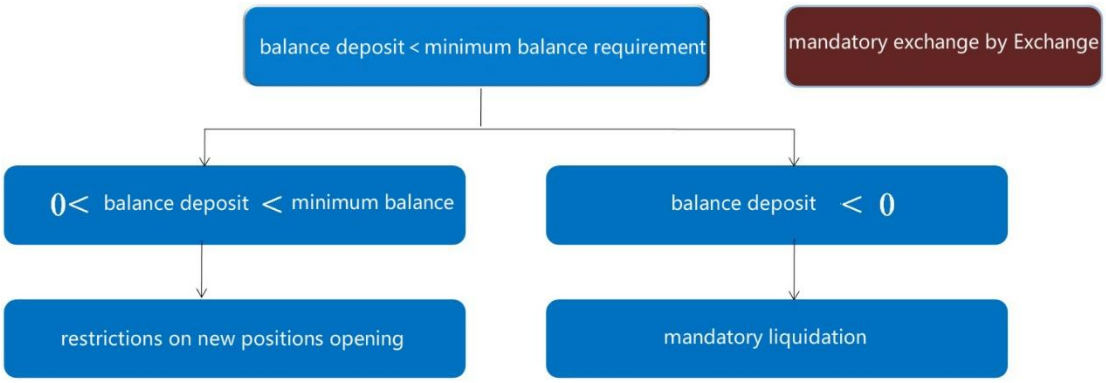
2. withdraw and deposit of foreign currency:

	Content
withdraw and deposit	• Electronic system of fund withdraw and deposit • 业务办理时间与人民币资金一致
Actual available balance	• valuation： CNY amount converted from foreign currency • benchmark price： middle rate released by China Foreign Exchange Trade System
Actual monetary capital	• Actual monetary capital=CNY capital+ CNY amount converted from foreign currency • Balanced foreign currency will generate current interest rates

3. settlement and purchase of exchange



4. marketing-to-market



a. minimum balance deposit for futures company member is 2 million CNY, minimum balance deposit for non-futures company member is 500,000 CNY.

b. Every time a futures company member has a new overseas brokerage institution client, the minimum balance deposit for the member should raise by another 2 million CNY.

c. Member's balance deposit should be made by its own funds in CNY.

5. bonded delivery settlement

· Settlement of payment: bonded exchange for physicals, one-off delivery and standard warehouse receipt are settled by exchange

· invoice issuance: value added tax invoice issued by domestic institutions, receipt issued by overseas institutions

Invoice issuance by fiver parties: seller client→seller member→exchange→buyer member→buyer client, 5% of goods' value is collected as invoice margins

If seller member fails to provide value added tax invoice seven days later than deadline, exchange will charge 5% of goods' value. Starting from that day, exchange will charge another 0.5% of goods' value per day until the invoice is provided. If the sell member still fails to provide invoice 30 natural days later, it deems as failure to provide invoice and the money deducted will not be returned. The deadline for providing invoice of bonded warehouse receipt of iron ore is before marketing close of last delivery day. The deadline for providing invoice of exchange for physicals is before marketing close of the day exchange for physicals is approved.

V. Delivery Rules and Regulations

i. general rules and regulations of delivery

a. delivery object is iron fines (coarse powder)

b. physical delivery with delivery unit of 10,000 tons

c. delivery not allowed for individual trader and non-integral multiple of delivery unit

d. two ways including bill of lading and standard warehouse receipt with the latter one consists of delivery duty paid standard warehouse receipt and bonded standard warehouse receipt

e. trader's physical delivery is handled by members and traded in exchange in the name of members

f. When the market closed at the last trading day, all positions that are not closed out shall be delivered. On the principle of minimum pairs, computer system will match and pair contracts and bonded warehouse receipt is prioritized for overseas buyers.

g. invoice flowchart: five parties issue invoice in terms of bonded delivery, which means, buyer trader issues invoice for seller member, seller member issues invoice for exchange, exchange issues invoice for buyer member, buyer member issues invoice for buyer trader. Overseas trader and overseas economic institution issue certificate of receipts whereas exchange and member issue zero-tax value added invoice.

ii. delivery fee

· delivery commissions: 0.5 CNY/ ton

· storage charge: 0.5 CNY/ ton / day

· Quality inspection fee is negotiated and determined by goods owner and designated institution for quality inspection. The fee will be borne by goods owner and the goods will be transferred by designated delivery warehouse.

· There's a price limit for warehouse storage and the cost standard is to be verified and released by exchange.

iii. place of delivery

· places of warehouses: Tianjin port, Lianyun port, Rizhao port, Qingdao port, Tangshan port, Caofeidian port

· places of storages: HBIS Group Mining Company, Shagang International, Ruiganglian Group, Sinosteel Deyuan Mining Products, Rizhao Steel, Hangzhou CIEC International Co., Ltd., Shandong Huaxin Group, Ansteel, China National Building Materials & Equipment Supply Chain, Cargill Maituo Metal Trade, HBIS International, Sinoday.

· domestic places of storages: HBIS International

· places of bonded delivery: Dalian port, other ports to be added from now on

iv. standard substances and substitutes for delivery

chart: standard substances for iron ore delivery

指标	质量标准
Fe	= 62.0%
SiO_2	≤4.0%
Al_2O_3	≤2.5%
P	≤0.07%
S	≤0.03%
microelement	Pb≤0.02% Zn≤0.02% Cu≤0.20% As≤0.02% TiO_2≤0.80% F+Cl≤0.20% K_2O+Na_2O≤0.30%
Particle size	Particle size larger than 6.3mm accounts for no more than 20% Particle size smaller than 0.15mm accounts for no more than 35%

Chart: quality differences and premiums and discounts for substitutes of delivery

indicator	Range allowed	premiums and discounts（CNY/ton）
Fe	≥60.0%	≥60.0% and < 62.0%，decrease 1.5 per 0.1% reduced
		> 62.0% and ≤65.0%，increase 1.0 per 0.1% increased
		> 65.0%，set the price the same as 65.0%
SiO_2 + Al_2O_3	≤8.5%	0
SiO_2	≤6.5%	> 4.0% and ≤4.5%，decrease 1.0 per 0.1% increased； > 4.5% and ≤6.5%，decrease 2.0 per 0.1% increased, accumulative calculated with the prior standard

Al_2O_3	≤3.5%	> 2.5% and ≤3.0%, decrease 1.5 per 0.1% increased > 3.0% and ≤3.5%, decrease 3.0 per 0.1% increased accumulative calculated with the prior standard
P	≤0.15%	> 0.07% and ≤0.10%, decrease 1.0 per 0.01% increased; ; > 0.10% and ≤0.15%, decrease 3.0 per 0.01% increased, accumulative calculated with the prior standard
S	≤0.20%	decrease 1.0 per 0.01% increased
Particle size	Particle size smaller than 0.075mm accounts for no less than 70%	0

Chart: historical delivery summary since iron ore enters the market till now (June, 2018)

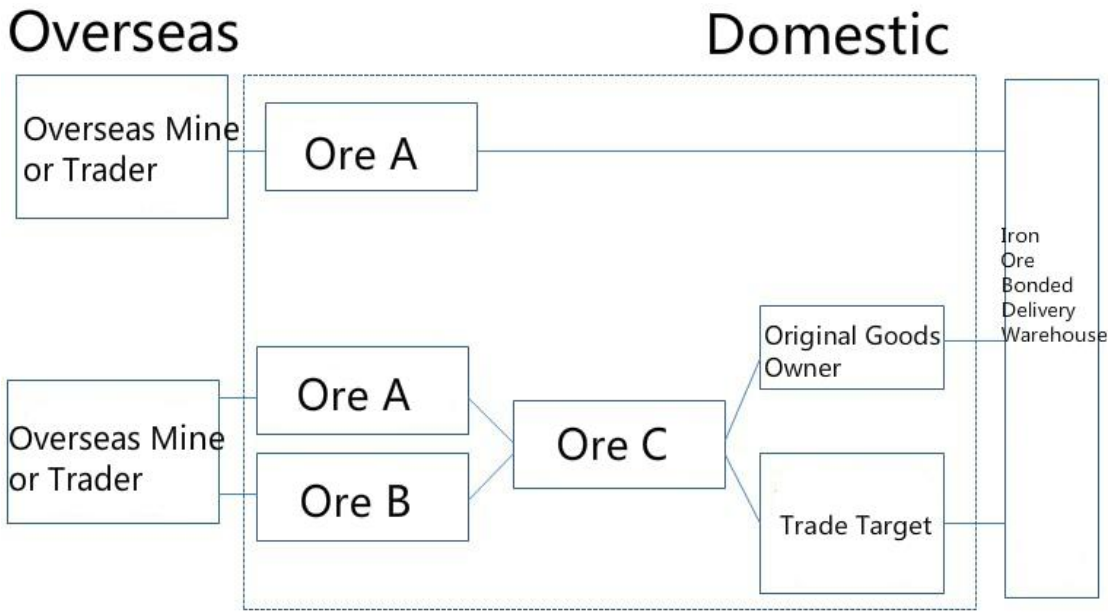
Contract	Delivery Date	Delivery Volume	Amount	Contract	Delivery Date	Delivery Volume	Amount
i1405	20140521	1,700	141,440,000	**i1604**	20160420	200	8,510,000
i1406	20140619	500	35,250,000	**i1605**	20160519	3,200	173,280,000
i1409	20140918	1,300	76,570,000	**i1606**	20160621	100	4,745,000
i1505	20150520	2,500	118,250,000	**i1609**	20160921	2,400	113,160,000
i1506	20150617	300	14,625,000	**i1701**	20170119	2,100	140,280,000
i1508	20150819	600	24,840,000	**i1705**	20170518	3,200	154,880,000
i1509	20150921	800	37,320,000	**i1707**	20170719	200	9,340,000
i1512	20151217	100	3,420,000	**i1709**	20170919	2,000	120,700,000
i1601	20160120	16,100	558,670,000	**i1801**	20180118	2,000	98,000,000
i1604	20160415	100	4,505,000	**i1803**	20180319	500	26,425,000
				i1805	20180518	10,600	509,860,000

From the statistics, since iron ore enters the market, it has been delivered for 21 times till now with a total delivery volume of 5.05 million tons. The first delivery contract is I1405 with a delivery volume of 170,000 tons. The largest delivery volume is 1.61 million tons in the contract I1601. The smallest delivery volume is 10,000 tons in contracts I1512, I1604, I1606. The main delivered products are SSFG, Kimbap powder, Indian Fines, etc. After DCE updated its delivery standard of iron ore in 2017, part of SSFG no longer meets the criteria so the main products are Kimbap powder and Indian Fines after the contract I1809.

Bonded products of delivery shall meet the following requirements:

1. The products shall be sent directly from overseas by goods owner to bonded delivery warehouse.

2.



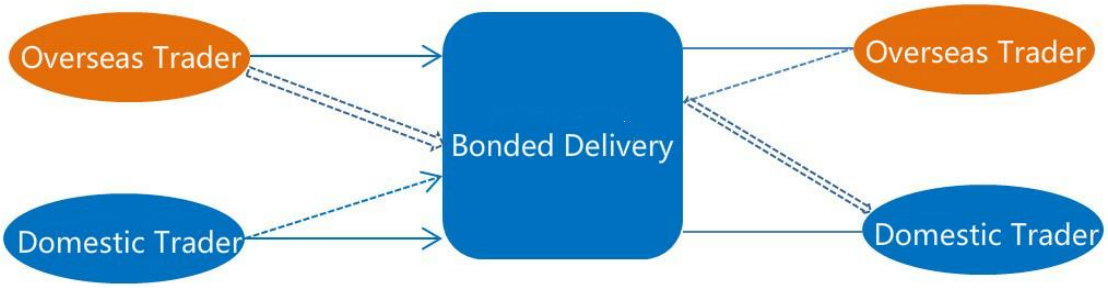
v. delivery subject

· physical delivery of client shall be handled by members and conducted in the name of members in exchange.

· overseas clients shall authorize overseas futures brokerage company to conduct physical delivery, overseas futures brokerage company shall authorize domestic futures company to conduct physical delivery. Bill of lading shall be handled by members.

vi. rules and regulations of delivery of overseas clients

1. ways of delivery



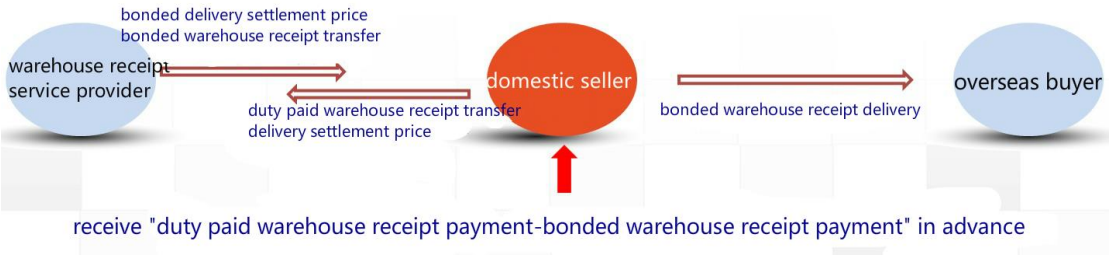
Overseas clients could register bonded warehouse receipt to engage in delivery, and exchange shall make sure that overseas buyers can receive bonded warehouse receipt by replacement of warehouse receipt.

2. ways to make sure that overseas clients could receive bonded warehouse receipt

a. matching principle: i. bonded warehouse receipt shall be prioritized to match overseas clients ii. The insufficient part of bonded warehouse receipt shall be provided

by replacement of warehouse receipt

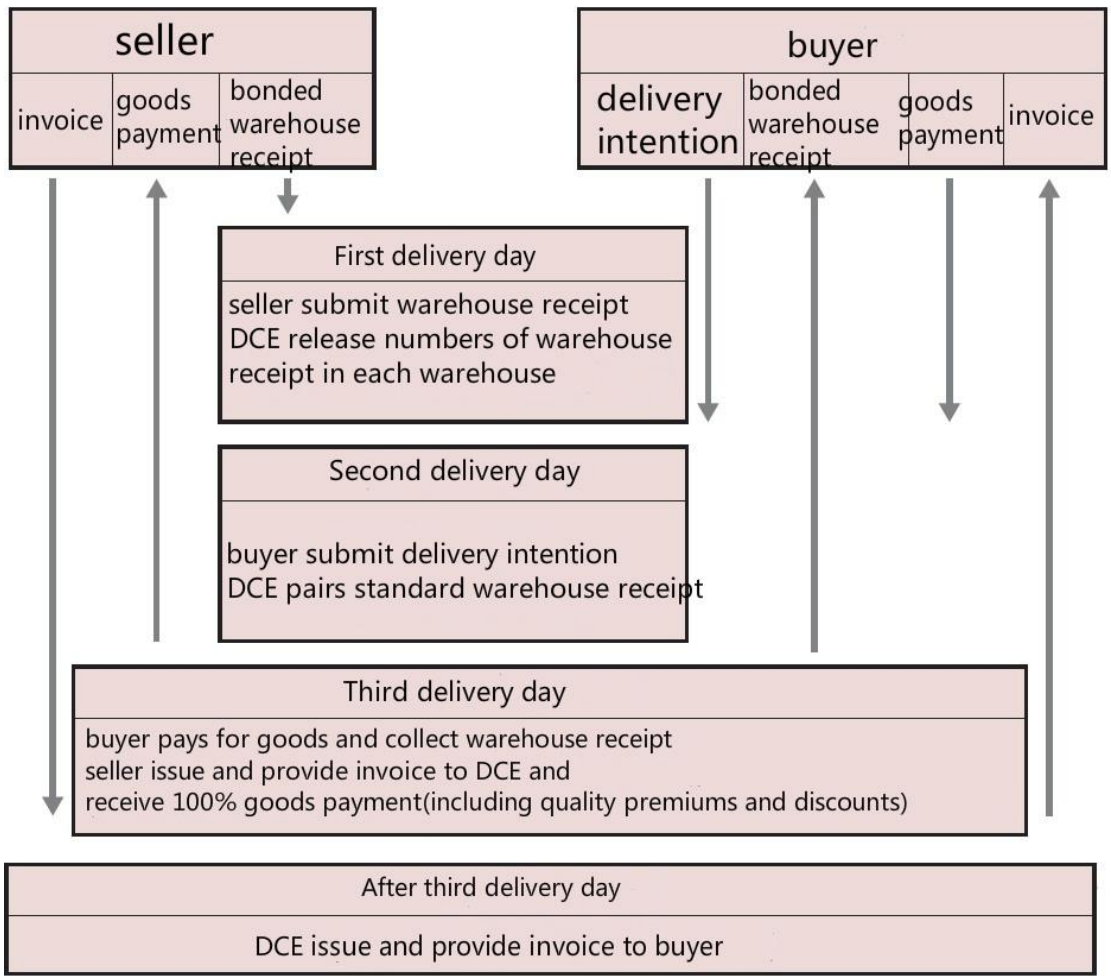
b. replacement of warehouse receipt: warehouse receipt service provider registers bonded warehouse receipt and replace receipt from domestic seller.



3. ways of issue invoice

Five parties issue invoice, which means, seller client→seller member→exchange→ buyer member→buyer client. Overseas seller institution could issue receipt voucher (commercial invoice), overseas buyer institution could receive value added tax invoice, domestic institutions could issue and receive value added tax invoice.

4. flowchart of bonded delivery



5. procedures after receiving bonded warehouse receipt

a. continue to circulate as warehouse receipt: calendar spread delivery, exchange for physicals, transfer of warehouse receipt

b. import customs declaration: to finish the import customs declaration after the warehouse receipt is cancelled and provide documents for import customs declaration to warehouse. To fill out application for domestic remittance and provide application and documents for import customs declaration to depository bank. After application for remittance, to provide customer copy of application for domestic remittance and other relevant documents.

c. export customs declaration: provide export customs declaration for bonded delivery warehouse before the warehouse provides it to exchange.

6. application methods for members in dealing international balance of payments

i. bonded delivery list and application requirement

domestic members:

register foreign exchange business directory: bring member certificate to local State Administration of Foreign Exchange according to the third clause, appendix ii, in the files marked as foreign exchange [2012] No. 38

declaration of income and expense of goods: two types of application shall be made when settle accounts with overseas trader or futures brokerage institution through depository bank: net margin settlement, restore data settlement.

ii. import payment declaration for domestic clients

requirement: processed when domestic buyer declare import customs

declaration: depository bank make payment declaration for domestic clients and receipt declaration for futures company or exchange. Transaction code: 121030, with transaction notes: iron ore futures.

iii. how to declare customs

provide bonded delivery settlement chart for customs declaration; provide China Inspection and Quarantine (CIQ), settlement statement for customs declaration (exchange), bonded warehouse receipt (warehouse) for customs declaration.

7. delivery default

5% of goods value is to be charged if one fails to provide invoice seven days later before marketing close of the last delivery day;

If seller fails to provide warehouse receipt, buyer fails to pay off, delivery default will occur. The default party will pay 20% worth of contract value to the other party. If both parties default, both would be charged 5% worth of contract value.

VI. Hedging and Arbitrage Rules and Regulations

i. hedging management

DCE implements accreditation and quota management for hedging. There are two quota limits depending on ordinary month and delivery month.

1. qualification application for hedging

a. Investors apply through futures company member. Once the application is reviewed and verified, futures company member could perform the application procedures on behalf of traders.

b. non-futures company member applies the procedures directly from exchange.

c. For those investors who authorize overseas futures brokerage institution for apply, domestic futures brokerage institution will apply for overseas futures brokerage institution.

Materials to be submitted:

a. copy of operating license of the trader

b. copy of value added tax invoice or other documents approved by exchange

c. original copy of commitment letter

2. quota application for hedging in ordinary months

(notes: ordinary months refer to the period starting from the day contract goes to the market to the last trading day of the month prior to the delivery month)

The trader shall provide the following materials according to the trading product:

a. performance of spot goods of last year as well as operating plan while it's in hedging;

b. quota limit in the hedging management system applied by futures company

c. other materials required by exchange

3. quota application for hedging in delivery month

(notes: delivery month refers to the first trading day till the last trading day in the delivery month)

The trader shall provide the following materials according to contracts:

a. performance of spot goods of last year as well as operating plan while it's in hedging;

b. quota limit in the hedging management system applied by futures company

c. hedging trading plan, including analysis of risk source and hedging target

d. supporting evidence for spot goods held or to be held, and the statement of its usage. Relevant materials supporting the real need for transaction near the delivery month.

e. other materials required by exchange

4. quota limit that can be automatically approved

When ordinary hedging comes to delivery month, the quota limit of ordinary hedging combined with minimum quota limit of arbitrage in delivery month could be the new quota limit. It means that the quota limit of hedging in delivery month = quota limit of arbitrage in delivery month + automatically approved quota limit

5. application and implementation time for hedging

Deadline for quota limit usage for hedging in ordinary months	The last trading day of the month prior to delivery month
Deadline for quota limit usage for hedging in delivery month	The first trading day till the last trading day in delivery month
Deadline for application for quota limit in delivery month	The last trading day of the month prior to delivery month

ii. arbitrage trading management

calendar spread arbitrage: arbitrage trading between different contracts with the same product.

inter-commodity spread arbitrage: arbitrage trading between different contracts with different products.

Depending on various contract months, there are ordinary month arbitrage (start from the day the contract entered the market till the last trading day of the month prior to delivery month) and delivery month arbitrage.

Investors send the request for upgrading quota limit of arbitrage through futures company member. Once futures company review and approve, the futures company member will handle the application procedures on behalf of traders; Non-futures company member apply directly from exchange; Overseas clients who entrust overseas brokerage institutions to apply for quota limit of arbitrage will be handled by domestic futures company member.

Required materials for applying upgrading arbitrage quota limit:

1. applying upgrading arbitrage quota limit in ordinary month

a. application form for upgrading quota limit, including basic information of applicants, products, quantity, strategy of arbitrage trading and other information.

b. other materials required by exchange.

Exchange will examine the whole materials within five trading days and provides feedback.

2. applying upgrading arbitrage quota limit in delivery month

a. application form for upgrading quota limit, including basic information of applicants, products, quantity, strategy of arbitrage trading and other information.

b. application analysis of price spread deviation.

c. other materials required by exchange.

The deadline of application of upgrading arbitrage quota limit in ordinary months is the last trading day of the month prior to the delivery month.

Exchange will examine the whole materials from the first trading day of the month prior to delivery month for arbitrage and will provide feedback within five trading days.

VII. Risk Management and Monitoring Rules and Regulations

i. risk management

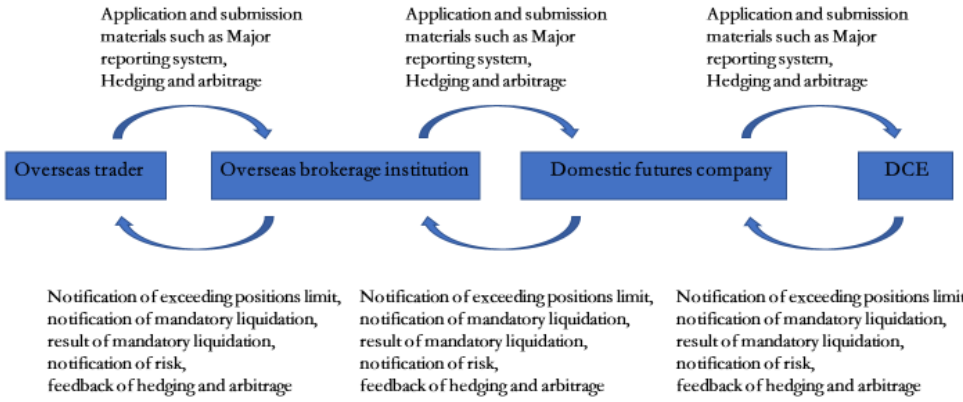
1. major reporting system: Overseas clients shall entrust overseas brokerage institution to report, and overseas brokerage institution shall entrust domestic futures company member to report; futures company member, overseas brokerage institution shall review the relevant materials provided by clients and verify its authenticity and accurateness.

2. mandatory liquidation: mandatory liquidation will be executed at 13:30 instead of 10:30. The quota limit for individual clients in delivery month is 0. Loss incurred from mandatory liquidation will be first borne by futures company member on behalf of overseas brokerage institution, then the overseas brokerage institution will ask from the clients for compensation.

3. methods in abnormal transaction: during iron ore futures trading, the exchange shall announce to be in abnormal circumstances when war, social upheaval, natural disaster happens or is to happen which could have severe influence on iron ore importation.

4. risk alert system: the system is also applied to overseas brokerage institution, for example, to specify under what circumstances, the exchange could alert risks or send risk notification to high ranking officials of overseas brokerage institution or overseas clients.

ii. flowchart for relevant international business



Notes: Major reporting system, results of mandatory liquidation, risk notification and other procedures related to risk control shall hidden the clients' names from member whereas application for hedging and arbitrage requires the clients to submit relevant supporting materials, in which case the names could not be hidden.

iii. daily risk management business

1. margins management

DCE collects trading margins first before clients' trade.

Trading margins shall be certain proportion of the contract value. The margins are not fixed numbers, there's no such requirements as initial margins and maintained margins. Margins discounts provided for portfolio holdings which meet the requirements of Exchange, no SPAN.

2. price limits system

Daily price fluctuation shall be certain proportion to the settlement price of the last

trading day. The Exchange could adjust according to the market. Currently, the price limits for iron ore is 8%.

When the price reaches the limit, the fluctuation will be expanded and so is the standard for trading margins.

	First trading halt	Second trading halt	Third trading halt
Price fluctuation	P	P+3%	P+5%
Standard of trading margins	M	Max[M，P+5%]	Max[M1，P+7%]

For example, trading margins for iron ore is 10%, the price limit is 8%

At the second trading halt, the price limit is 8+3=11%，and the trading margins is Max(13%,10%)=13%

At the third trading halt, the price limit is 8+5=13%，and the trading margins is Max(15%,13%)=15%

3. trade limit system

Trade limit system means the maximum numbers of positions a member of client could open for certain contract in certain period. The exchange can set limits to different contracts, different products in different contract months for partial or all members and clients.

For those non-futures company member or clients who exceeds the trade limit, the exchange could notify by phone, and request for report, request for submission of written commitment, and list them for severe supervision or suspend their positions opening.

Trade limit system is one major difference between China futures market and America and other overseas market. However, it only limits the numbers of positions opening and doesn’t limit the close out of positions. It only limits the arbitrage behavior and doesn’t limit hedging behavior.

4. position limit system

Position limit system means the maximum number of positions held for arbitrage by members or clients for certain contract. The number is calculated unilaterally. The purpose of this system is to prevent the risk of market manipulation, prevent certain

investors from causing bad influence to the market due to its market share.

Unilateral position limit: The number is calculated unilaterally and both buy and sell direction shall meet the limitation rules.

Position limit for clients: There's position limit for non-futures company member and clients, there's no position limit for futures company member and overseas brokerage institutions.

Position limit management for accounts actual controller: Clients shall declare its identity if they are accounts actual controller. Positions held by actual controller will be combined and calculated as one client.

Time difference: There're three different position limit amounts for different stages.

5. hedging management

Step1: apply for hedging qualification

Non-futures company member and clients engaging in hedging trade shall have production and operation qualification.

Step2: record spot goods size

Scale of operation of spot goods shall be provided, including the business performance of last year and business plan of current year.

Step3: apply for quota limit for hedging

To inform Exchange the maximum quota limit of iron ore in ordinary months or delivery month in contracts.

Step4: Exchange examine and review

During ordinary months: Exchange system will automatically calculate the client's positions limit everyday according to the scale of spot goods operation and the requirement of hedging as well as positions holding in each contract under different products.

In delivery month: To be discussed by supervision department, business department and membership department together.

6. arbitrage management

Application submission:

a. original copy of Application Form. (Application Form will be filled out online since

April, 2018)

b. clients submit application through members

c. overseas clients submit application through overseas brokerage institution, overseas brokerage institution submit application through members

Positions holding review:

Over 80% quota of positions holding shall belong to arbitrage. (dominant contract)

Principles of examine and review:

During ordinary months: no more than 25% of positions size.

1.5 times, twice and three times of the positions limit of clients which shall be examined and approved step by step.

During delivery month: In principle, no examine and approve for application shall be conducted.

7. major reporting system

One shall report its capital and positions when the position holding exceeds 80% of positions limit.

Clients shall report through futures company member.

Overseas clients shall report through overseas brokerage company, and overseas brokerage company shall report through domestic futures company member. (overseas clients' name shall be hidden from members)

8. mandatory liquidation

It is a mandatory measure taken by exchange when members or clients break the rule.

It happens when members' capital is insufficient, clients' position reach limit, break the rules or under other circumstances.

The traded price is made by market transaction. Precatory price in mandatory liquidation refers to the price of price limit.

Mandatory liquidation shall be executed at 13:30, given the time difference for overseas clients and inconvenience of capital turnover.

9. abnormal transaction management

· Frequently submit and revoke the deal or submit and revoke the deal in large scale.

· self-trading: to trade with itself.

· programming: bulk deals can be automatically made by computer programming which could threaten the system safety and normal business operation.

· account actual controller: portfolio of accounts which exchange believes exceed the positions limit; self-trading, frequently submit and revoke the deal or submit and revoke the deal in large scale will be convicted the same punishment as clients and non-futures company member.

Appendix I: iron ore delivery warehouse

序号	交割仓库名称	协议库容（万吨）	装运站/港	交割专区	基准库/非基准库	升贴水（元/吨）
1	天津港交易市场有限责任公司	100	铁路：东大沽站 船舶：天津港码头	天津港港区	基准库	0
2	江苏连云港港口股份有限公司	20	铁路：连云港东站 船舶：连云港码头	连云港港区	基准库	0
3	日照港股份有限公司	40	铁路：日照站　船舶：日照港码头	日照港港区	基准库	0
4	青岛港国际股份有限公司	300	铁路：黄岛站 船舶：青岛港码头	青岛港港区	基准库	0
5	唐山港京唐港区进出口保税储运有限公司	50	铁路：京唐港站 船舶：唐山港码头	京唐港港区	基准库	0
6	曹妃甸港集团有限公司	100	铁路：曹妃甸站 船舶：曹妃甸港码头	曹妃甸港区	基准库	0
7	唐山曹妃甸实业港务有限公司	50	铁路：曹妃甸南站 船舶：曹妃甸港码头	曹妃甸港区	基准库	0
8	大连港散货物流中心有限公司	55	船舶：大连港矿石码头 铁路：金港站	本库区	非基准库	-10

Appendix II: iron ore storage houses

序号	交割厂库名称	标准仓单最大量（万吨）	日发货速度（万吨/天）	基准库/非基准库	与基准库升贴水（元/吨）
1	河北钢铁集团矿业有限公司	15	1	基准库	0
2	江苏沙钢国际贸易有限公司	20	1.5	基准库	0
3	瑞钢联集团有限公司	15	1	基准库	0
		15	1	基准库	0
4	中钢德远矿产品有限公司	20	1.5	基准库	0
5	日照钢铁控股集团有限公司	20	1.5	基准库	0
6	杭州热联集团股份有限公司	10	1	基准库	0
		15	1	基准库	0
		10	1	基准库	0
7	山东华信工贸有限公司	15	1	基准库	0
8	鞍钢股份有限公司	20	1.5	非基准库	-10
9	中建材供应链管理有限公司	20	1.5	基准库	0
		20	1.5	基准库	0
		20	1.5	非基准库	-10
10	嘉吉迈拓金属贸易（上海）有限公司	20	1.5	基准库	0
11	河钢集团北京国际贸易有限公司	15	1	基准库	0
		15	1	基准库	0
12	大有资源有限公司	10	1	基准库	0
		10	1	基准库	0