

PTA Futures Trading Manual

Founder Cifco Futures Co., Ltd.

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Chapter I. Overview of PTA

I. Brief Introduction

PTA (i.e. Pure Terephthalic Acid), a kind of white powder crystal at room temperature, is non-toxic, inflammable and combusive under certain circumstances when mixed with air.

PTA is downstream product of petroleum. Naphtha can be produced from petroleum after certain engineering process. MX (i.e. mixed xylene) can be produced from naphtha after refinery, and PX (i.e. paraxylene) can be produced from MX after further refinery. Take PX (65%-67% of formula) as ingredient and acetic acid as solvent, CTA (i.e. crude terephthalic acid) can be produced under catalyst and oxidation (with oxygen accounting for 35%-33%). PTA can be produced after CTA is purified by a hydrogenation step, crystallization, solid-liquid separation and drying.

II. Structure of PTA Industry

PTA is downstream product of petroleum. It is produced from PX. PX is produced from petroleum. PTA is upstream product of chemical fiber mainly including polyester filament yarn, staple fiber and chip (including fiber chip, bottle flakes, film chip)

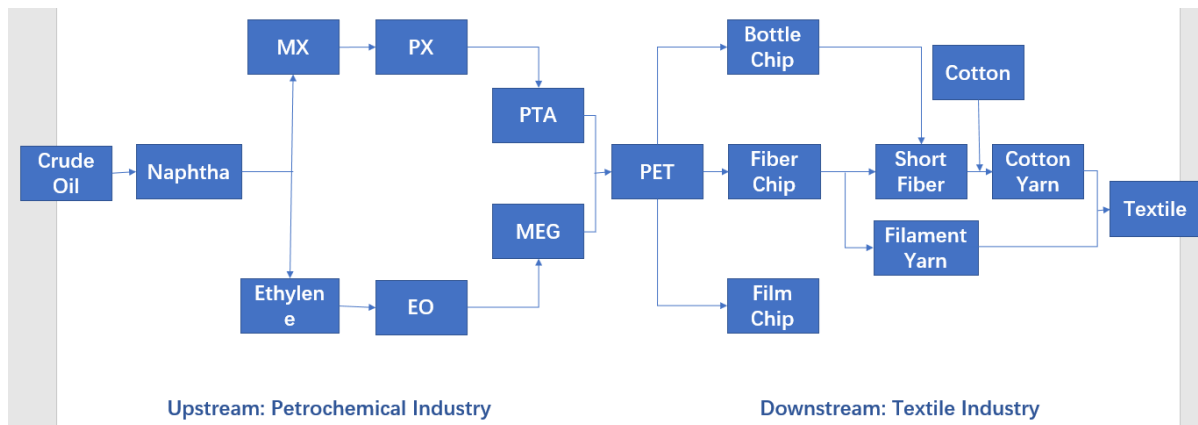


Chart I. PTA Industrial Chain

Source: Research Institute of Founder CIFCO Futures

To be specific, the source of PTA is petroleum. Naphtha (i.e. light naphtha) can be produced from petroleum after certain engineering process. PX (i.e. paraxylene) can be produced from naphtha after certain engineering process. PTA (powder) can be produced from PX (65%-67% of formula) after oxidation (with oxygen accounting for 35%-33%), crystallization, solid-liquid separation and drying. PET (i.e. polyester chip) can be produced with PTA and MEG (i.e. glycol, liquid). Every ton of PET produced requires 0.85-0.86 ton of PTA and 0.33-0.34 ton of MEG. PET can be classified into polyester fiber, polyester film and polyester bottle flakes. Polyester fiber (i.e. Dacron) can be classified into filament yarn and short fiber. The output of filament yarn accounts for 62% of overall output of polyester fiber and the output of short fiber

accounts for the other 38%. Filament yarn is used in textile enterprise while short fiber is usually blended with cotton.

Chapter II. Cost Analysis of PTA

I. Cost Structure of PTA

The cost structure of PTA mainly consists of PX's cost, manufacture cost and depreciation of fixed assets.

As main ingredient of PTA, the cost of PX accounts for large portion in the cost structure of PTA, approximately 92%. Therefore, PX industry has strong correlation with PTA industry. Like PX manufacturers, PTA manufacturers are also located at riverside or coastal regions, which could minimize the transportation cost of ingredient and products.

From the cost structure, besides the cost of PX, other cost is caused by public utilities (steam, water, electricity), acetic acid, depreciation, finance and transportation. Therefore, the production cost of PTA is directly related to the economies of scale. Take PTA manufacturer with middle scale of production as an example, the production cost of $PTA - 0.66 * PX$ is around 600 CNY per ton.



Chart II. Price Trend of PX/PTA

Source: Wind, Research Institute of Founder CIFCO Futures

II. Brief Introduction to PX

PX (i.e. paraxylene) is colorless and translucent liquid with aromatic flavor. Naphtha can be produced

from crude oil under atmospheric and vacuum distillation. Based on carbon content, purified petroleum benzene, methylbenzene and xylene can be produced from naphtha after cracking plant or reforming plant. PX can be produced from xylene after aromatics isomerization. PX is mainly used in producing PTA. In China, 97% of PX is used in producing PTA, with the other 3% of PX is used as DMT (i.e. medical intermediate) and paint. The upstream product of PX is crude oil, naphtha and the downstream product of PX is PTA and polyester chemical fiber. Therefore, PX is the major junction connecting oil refinery and basic chemical engineering.

III. Global PX Industry Status

Currently, the global capacity of PX is 55.13 million tons. 79% of PX is produced in Asia, followed by America, the Middle East and Europe, with the capacity accounting for 9%, 8% and 3% respectively. PX plant can hardly be found in other regions.

Currently, the capacity of PX in Asia is 42.46 million tons. China produces the largest portion of PX. However, though being the largest PX-producing country, China still failed to meet the demand for PX from downstream chain; therefore, large amount of PX is imported every year. Later China would put more PX plants into operation, thus increasing its capacity proportion. South Korea and Japan accounts for 23% and 10% of PX capacity in Asia. However, since there isn't much demand of PX domestically, large amount of PX are exported to China. India has witnessed an increasing PX capacity over these years, accounting for 14% capacity in Asia.

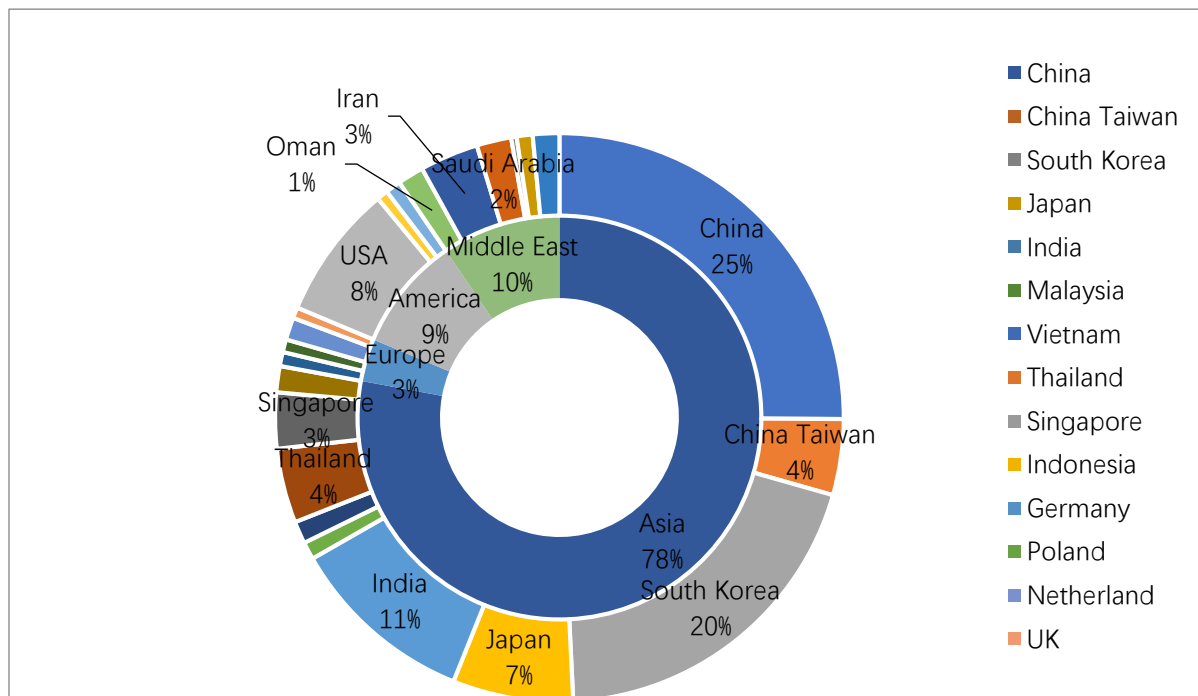


Chart III. Global PX Plant

Source: SCI99.com, Research Institute of Founder CIFCO Futures

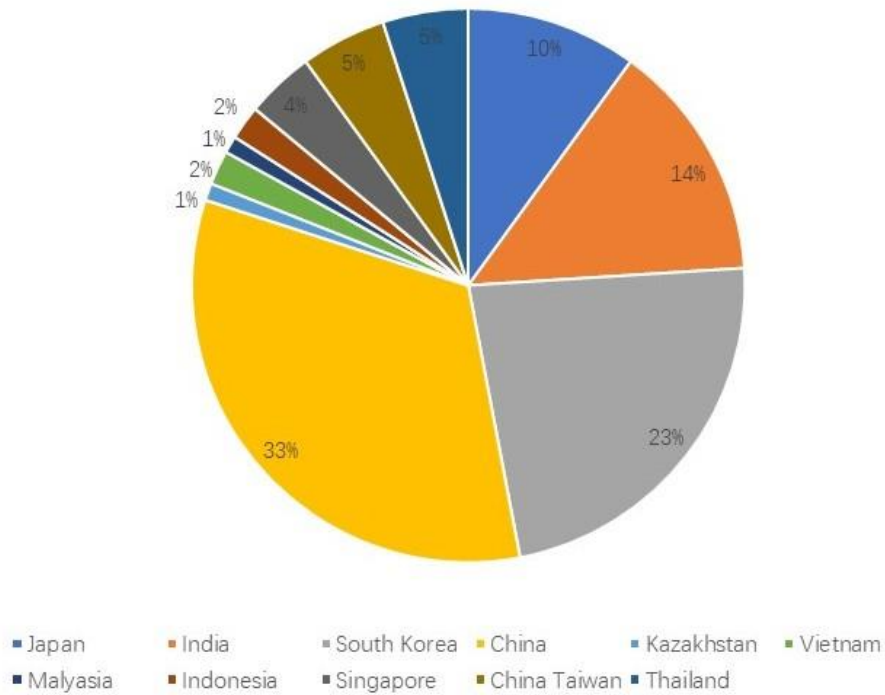


Chart IV. Asia PX Plant

Source: SCI99.com, Research Institute of Founder CIFCO Futures

IV. PX Industry Status in China

China's first set of PX plant was established by Sinopec Shanghai Petrochemical in 1986. Slow development was made in China's PX industry before the year of 1998 and the supply and demand was relatively balanced with PetroChina and Sinopec as major PX producers and suppliers. The year of 2000, 2009 and 2014-2015 marks the three phases of rapid development of China's PX industry. Tianjin Petrochemical unit with an annual output of 390,000 tons and Luoyang petrochemical unit with an annual output of 220,000 tons were put into operation in 2000. Shanghai Petrochemical Phase II unit with an annual output of 600,000 tons, Fujia Dahua Petrochemical unit with an annual output of 700,000 tons, Fujian Petrochemical unit with an annual output of 770,000 tons and CNOOC (Huizhou) unit with an annual output of 850,000 tons were put into operation in 2009, which increased the PX capacity by 68.38%. Fujian Dragon Aromatics unit with an annual output of 1.6 million tons, Pengzhou Petrochemical unit with an annual output of 650,000 tons were established and Zhongjin Petrochemical unit with an annual output of 1.6 million tons were put into operation in 2015. Pace slowed down and no more new PX unit were put into operation during 2016 and 2017.

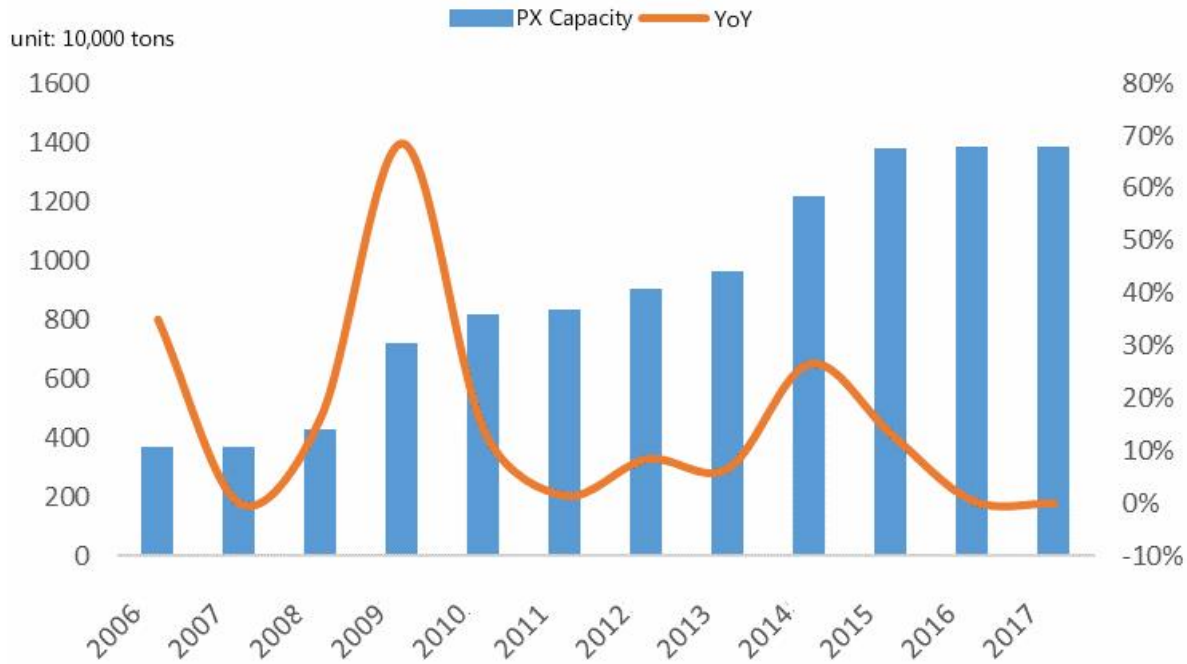


Chart V. PX Capacity

Source: Research Institute of Founder CIFCO Futures

Table I: Statistics of China's PX Plants

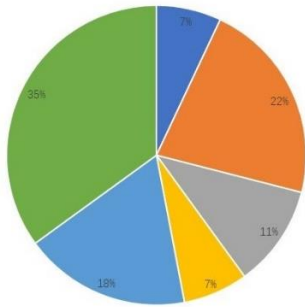
Enterprise	Region	Nature	City	Capacity	Starting Time
Zhenhai Refining & Chemical	Eastern China	Sinopec	Ningbo	65	April,2003
Yangzi Petrochemical	Eastern China	Sinopec	Nanjing	80	1989
Shanghai Petrochemical	Eastern China	Sinopec	Shanghai	25	1986, renewal in 1998
				60	2009
Jinling Petrochemical	Eastern China	Sinopec	Nanjing	60	April,2010
Zhongjin Petrochemical	Eastern China	Privately Owned	Ningbo	160	August,2015
Qilu Petrochemical	Northern China	Sinopec	Zibo	6.5	1989
Lidong Chemical	Northern China	Foreign Investment	Qingdao	100	2006
Tianjin Petrochemical	Northern China	Sinopec	Tianjin	37	2000
Luoyang Petrochemical	Northern China	Sinopec	Luoyang	22.5	2000
Liaoyang Petrochemical	Northern China	PetroChina	Liaoyang	70	Phase I:1996, Phase II:2005
Fujian Petrochemical	Southern China	Sinopec	Quanzhou	77	2011
Fujian Tenglong	Southern China	Joint Venture	Zhangzhou	160	2014

Hainan Refining & Chemical	Southern China	Sinopec	Haikou	60	2013
CNOOC (Huizhou)	Southern China	CNOOC	Huizhou	95	2009
Pengzhou Petrochemical	Central China	PetroChina	Pengzhou	75	February, 2014
Fujia Dahua Petrochemical	Northeast China	Privately Owned	Dalian	140	Phase I:2009, Phase II:2012
Urumchi Petrochemical	Northwest China	PetroChina	Urumchi	100	July, 2010

Source: Research Institute of Founder CIFCO Futures

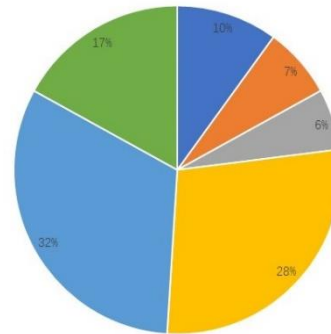
Sinopec, PetroChina and CNOOC are three major PX producers in China, with the capacity accounting for 35.39%, 17.59% and 6.82% capacity respectively. There are only two privately-owned enterprises, i.e. Fujia Dahua Petrochemical and Zhongjin Petrochemical, but produce up to 21.54% of PX. There are also foreign invested enterprises, such as Lidong Chemical, accounting for 7.18% of total capacity. There are also joint venture enterprises, such as Fujian Dragon Aromatics, accounting for 11.49%. Enterprises on the downstream of PX gradually expand its field of production towards the upstream of PX and more privately-owned enterprises would be established in the future.

PX plants are mainly distributed in Eastern China, Southern China and Northern China, accounting for 32%, 28% and 17% of total PX capacity, which is over three quarters of total PX capacity combined. The reason is that there are many developed coastal cities. Besides, many plants of downstream products of PTA are also located here.



Legend: Foreign Investment, Privately-Owned, Joint-Ventures, CNOOC, PetroChina, Sinopec

Chart VI. Nature of China's PX Enterprises



Legend: Northeast, Northwest, Southwest, Southern China, Eastern China, Northern China

Chart VII. Distribution Map of PX Capacity

Source: SCI99.com, Research Institute of Founder CIFCO Futures

V. PX's Imports and Exports in China

Compared with the soaring up of PTA's capacity, PX projects often encounter public pressure and approval difficulty. The capacity rarely grows and is far from meeting the demand from downstream,

resulting an ever-growing shortage gap every year. As a result, PTA plants could only rely on importing PX from neighboring countries and become increasingly dependent on them, leaving domestic market share increasingly occupied by South Korea, Japan, Thailand and other countries. In 2017, China produced 9.4373 million tons of PX, imported 14.4382 million tons of PX and exported 35,000 tons of PX, over 60.56% of PX was imported.

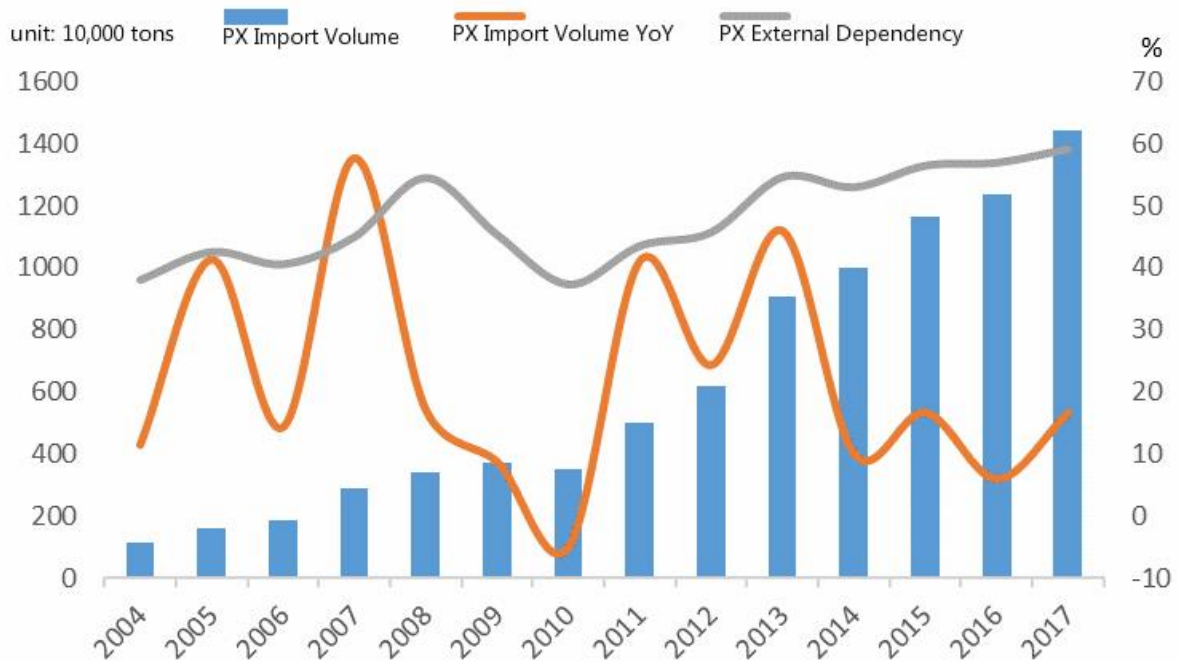


Chart VIII: PX Import Volume & Dependency Ratio

Source: Wind, Research Institute of Founder CIFCO Futures

Chapter III. Supply Analysis on PTA

I. Global Industry Status

PTA is mainly produced in Asia, North and South America and Europe, globally. Asia produces the most PTA, accounting for 86.78% of global PTA capacity. Over the past ten years, almost all newly established PTA plants are in Asia and most of them are in China. China is the production and consumption center of PTA around the world, accounting for 52.88% of global PTA capacity. Therefore, China's enterprises have more say in global PTA industry. Other countries and regions such as India, China Taiwan and South Korea also produce large amount of PTA.

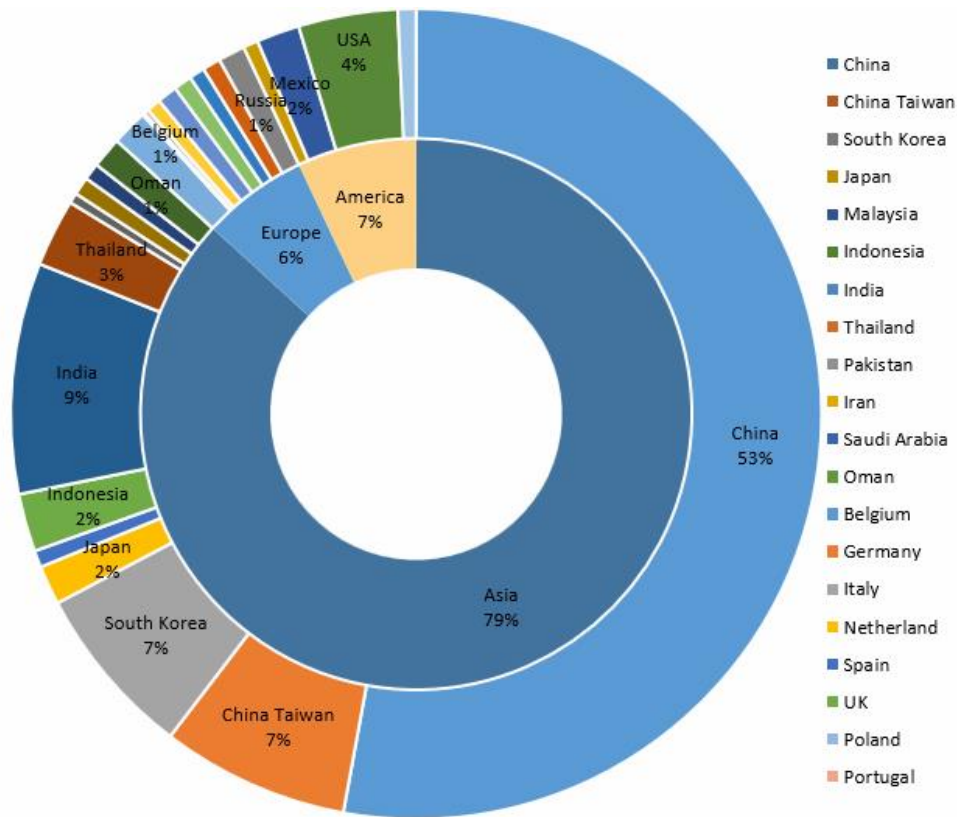


Chart IX: Countries & Regions Map of Global PTA Plants in 2017
Source: SCI99.com, Research Institute of Founder CIFCO Futures

II. Industry Status in China

Amoco Chemicals purchased Company Mid-Century's intellectual property and achieved industrialized production of TA. PET can be produced after TA's esterification with methanol and DMT. Amoco Chemicals successfully developed the method to produce PTA with purification with hydrogenation and achieved industrialized production of PTA. Numbers of plants with large scale of industrialization appeared one after another in early 1970s and China began to import PTA plants at the middle and later periods of 1970s, such as Yangzi Petrochemical and Shanghai Petrochemical PTA plants. In early 1990s, countries and regions like China started to develop PTA industry in large scale and domestic PTA capacity saw a rapid increase, such as Yizheng Chemical Fiber, Liaoyang Petrochemical, Tianjin Petrochemical and Luoyang Petrochemical PTA plants. China's successful entering of WTO in 2001 largely boosted the export of textile apparel. The booming of textile industry also promotes the development of domestic chemical fiber industry. As the upstream of chemical fiber, PTA industry saw a rapid development. 2002-2006 and 2011-2012 marks the two phases that PTA's expanding capacity. Since 2012, PTA is in excessive supply and the PTA industry is stuck in loss. From 2015 till now, PTA capacity rarely grows and the total PTA capacity is 51.29 million tons by the end of 2017.

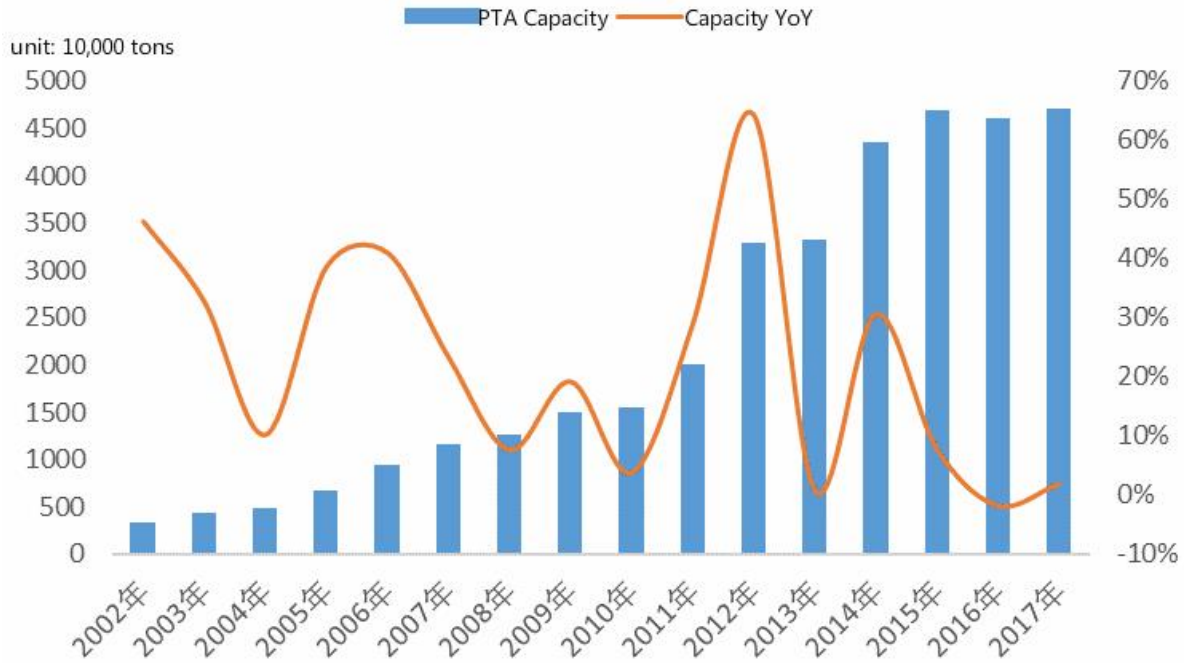


Chart X: PTA Capacity

Source: Wind, Research Institute of Founder CIFCO Futures

Table II: Statistics of China's PTA Plants

Region	Company Group	Manufacturer	City	Plants	Capacity	Time of Launch	Shutting Down
Eastern China	Yisheng Petrochemical	Ningbo Yisheng	Ningbo	1#	65	March 2007	
		Ningbo Yisheng	Ningbo	2#	65	May 2003	December 2013
		Ningbo Yisheng	Ningbo	3#	200	August 2012	
		Ningbo Yisheng	Ningbo	4#	220	April 2014	
	Huabin Petrochemical	Huabin Petrochemical	Shaoxing	1#	60	2005	March 2015
		Huabin Petrochemical	Shaoxing	2#	60	2006	March 2015
		Huabin Petrochemical	Shaoxing	3#	60	2006	March 2015
		Huabin Petrochemical	Shaoxing	4#	140	2012	
	Tongkun Petrochemical	Jiaying Petrochemical Phase I.	Jiaying	1#	150	September 2012	
		Jiaying Petrochemical Phase II.	Jiaying	1#	110	December 2017	
		Jiaying Petrochemical Phase II.	Jiaying	2#	110	December 2017	

Sinopec	Yangzi Petrochemical	Nanjing	1#	35	September 1989	May 2014	
	Yangzi Petrochemical	Nanjing	2#	35	September 1989		
	Yangzi Petrochemical	Nanjing	3#	65	November 2006		
	Yizheng Chemical Fiber	Yangzhou	1#	35	August 1995		
	Yizheng Chemical Fiber	Yangzhou	2#	65	April 2003		
	Shanghai Petrochemical	Shanghai	1#	40	1985		
Sanfangxiang Group	Hailun Petrochemical	Wuxi Jiangyin	1#	120	July 2011		
	Hailun Petrochemical	Wuxi Jiangyin	2#	120	September 2014		
Chengxing Group	Hanbang Petrochemical	Wuxi Jiangyin	1#	60	April 2011		
	Hanbang Petrochemical	Wuxi Jiangyin	2#	220	March 2016		
Liwan Group	Liwan Polyester	Ningbo	1#	70	April 2005		
Formosa Chemical	Ningbo Formosa Chemical	Ningbo	1#	120	June 2005		
Taiwan Far Eastern Group	Oriental Petrochemical	Shanghai	1#	70	April 2006		
Shenghong Petrochemical	Honggang Petrochemical	Lianyungang	1#	150	May 2014		
Zhenghao Group	Jinan Zhenghao	Jinan	1#	8.5	1995	2007	
Northeast China	Yisheng Petrochemical	Yisheng	Dalian	1#	225	January 2009	
		Yisheng	Dalian	2#	375	June 2014	
	Hengli Petrochemical	Hengli	Dalian	1#	220	September 2012	
		Hengli	Dalian	2#	220	October 2012	
		Hengli	Dalian	3#	220	February 2015	
PetroChina	Liaoyang Petrochemical	Liaoyang	1#	80	May 2007	June 2013	
Southern China	Yisheng Petrochemical	Yisheng Hainan	Danzhou	1#	200	November 2012	
	Xianglu Group	Xianglu Petrochemical	Xaimen	1#	165	2002	April 2015
	Fuhaichuang	Fujian Petrochemical	Zhangzhou	1#	150	April 2014	
		Fujian Petrochemical	Zhangzhou	2#	150	April 2014	
		Fujian Petrochemical	Zhangzhou	3#	150	April 2014	

	BP	Zhuhai BP	Zhuhai	1#	60	2003	2014
		Zhuhai BP	Zhuhai	2#	110	2008	
		Zhuhai BP	Zhuhai	3#	125	March 2015	
	Jialong Group	Jialong Petrochemical	Quanzhou Shishi	1#	60	April 2010	
Northern China	Sinopec	Tianjin Petrochemical	Tianjin	1#	34	2000	
Central China	Sinopec	Luoyang Petrochemical	Luoyang	1#	32.5	2000	
Southwest China	East Hope	Pengwei petrochemical	Chongqing Peiling	1#	90	November 2009	
Northwest China	PetroChina	Urumchi	Urumchi	1#	9	1995	

Source: SCI99.com, Research Institute of Founder Cifco Futures

Sinopec and PetroChina produce a small portion of PTA. The total capacity of PTA in Sinopec is 3.415 million tons, accounting for 6.66%. The total capacity of PTA in PetroChina is 890,000 tons, accounting for 1.74%. Since the PTA plants in Liaoyang Petrochemical suspended operation for a long time, only Urumchi Petrochemical plants with an annual output of 90,000 tons was under operation in PetroChina. China's PTA industry is basically the playground of privately-owned enterprises. Privately-owned enterprises in Eastern China started up in downstream apparels and textile industry. When PTA's technical barriers are lowered, they seized this historical opportunity and gradually develop the upstream and became the major supplies in the PTA market. Currently, the total capacity of PTA in privately-owned enterprises is 35.20 million tons, accounting for 68.63% of total capacity of PTA in China. Large proportion of the capacity lies in several privately-owned enterprises such as Yisheng Petrochemical, Hengli Petrochemical, Sanfangxiang Group and Tongkun.

In terms of regional distribution, PTA requires PX as ingredient which shall be imported and the demand from downstream mainly comes from chemical fiber enterprises. In order to purchase the ingredient and lower the logistic cost, most PTA enterprises locate in the coastal petrochemical bases and textile enterprises clusters. Currently, China's PTA plants are in Eastern China, North East China and Southern China coastal regions. The PTA capacity from Eastern China, North East China and Southern China accounts for 47.84%, 26.13% and 22.81%. The PTA capacity from Southwest China accounts for 1.75%. Few PTA plants are in Northern China, Central China and Northwest regions, accounting for less than 1% of total capacity.

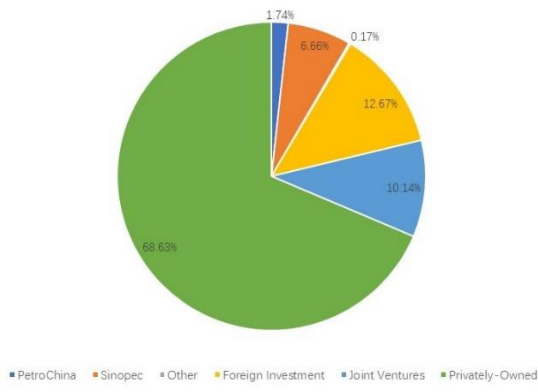


Chart XI. Nature of China's PTA Enterprises

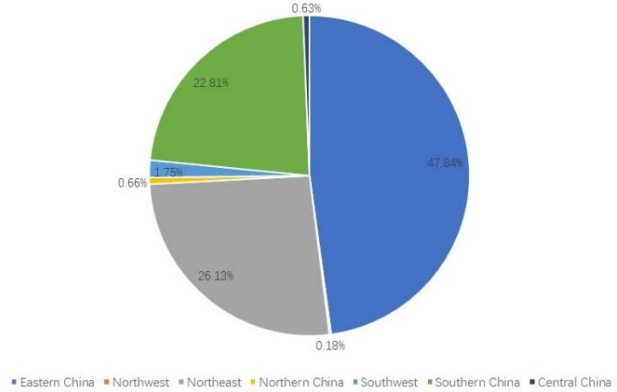


Chart XII. Distribution Map of PTA Capacity

Source: SCI99.com, Research Institute of Founder CIFCO Futures

III. Imports and Exports in China

China's import volume of PTA dropped sharply as China's been increasing its capacity, and the external dependency of PTA plummeted. Since China's PTA is in excessive supply, increasing the export is the best way to solve the problem for domestic producers. China became the PTA net export country for the first time in 2016. In 2017, the volume was largely balanced on both sides, with 526,300 tons of import and 523,200 tons of export.

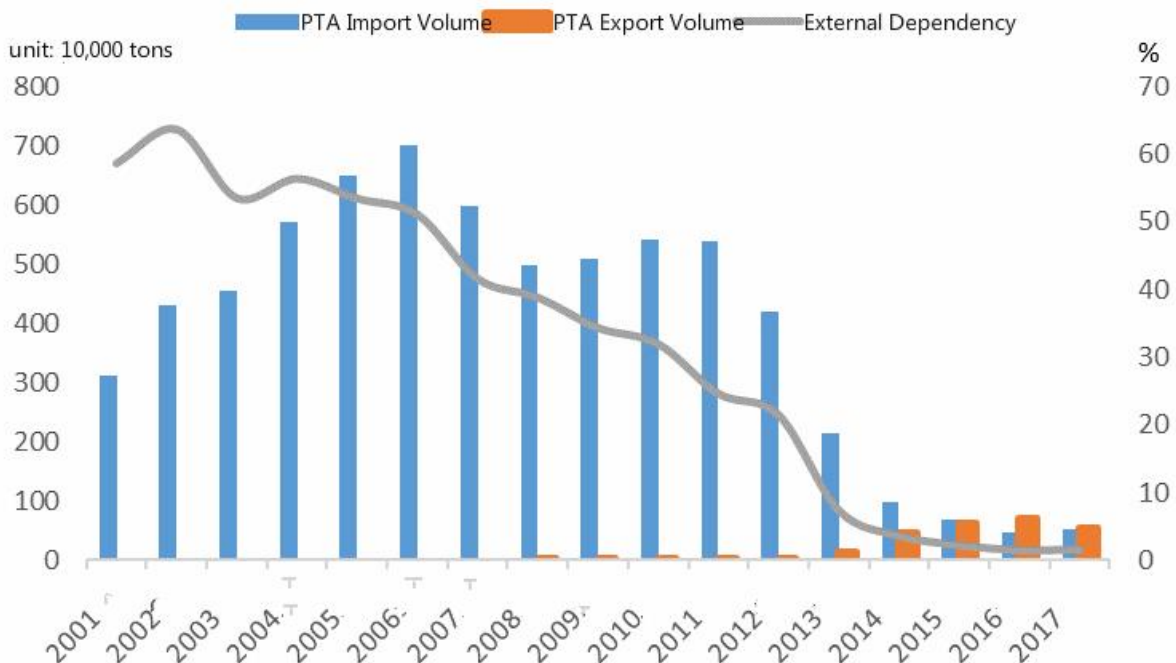


Chart XIII. Import & Export Volume of PTA & External Dependency

Source: Wind, Research Institute of Founder CIFCO Futures

IV. Domestic Supply and Demand

Since 2016, fewer PTA plants are established and domestic PTA throughput experienced modest growth, with the import dependence ratio keeps declining each year while import and export volume of PTA are basically the same.

Table3: Statistics of China's Supply & Demand of PTA During 2008-2017

	PTA Capacity	PTA Output	PTA Import Volume	PTA Export Volume	External Dependency	Apparent Consumption
2008	1256	935.00	497.74	0.89	34.76%	1431.85
2009	1406	1177.00	508.03	0.13	30.15%	1684.90
2010	1690	1592.00	540.24	0.43	25.34%	2131.81
2011	2040	1546.00	537.75	2.71	25.84%	2081.03
2012	3223	1853.00	419.49	0.90	18.47%	2271.59
2013	3303	2330.70	213.65	12.61	8.44%	2531.75
2014	4342	2715.00	98.11	46.27	3.55%	2766.84
2015	4689	3100.68	68.72	62.25	2.21%	3107.14
2016	4909	3232.44	47.15	69.53	1.47%	3210.06
2017	5129	3568.26	52.63	52.32	1.47%	3568.58

Source: Wind, SCI99.com, Research Institute of Founder Cifco Futures

Chapter IV. Demand Analysis on PTA

I. Brief Introduction to Polyester

Polyethylene terephthalate (PET) is produced from PTA and Ethylene glycol after polycondensation. Polyester products are classified into Polyester Filament Yarn (PFY), polyester staple fiber and polyester chip (fiber chip, bottle flakes and film chip). There are mainly two engineering of production in spinning of polyester, i.e. melt direct spinning and chip spinning. With the advancing of melt direct spinning technology, direct spinning has a dominant price advantage and the capacity of direct spinning soared up. Of all polyester products made in China, polyester filament yarn, polyester bottle flakes, polyester staple fiber, biaxially-oriented polyethylene terephthalate (BOPET) and polyester industrial yarn accounts for 62%, 17%, 12%, 5% and 4% respectively.

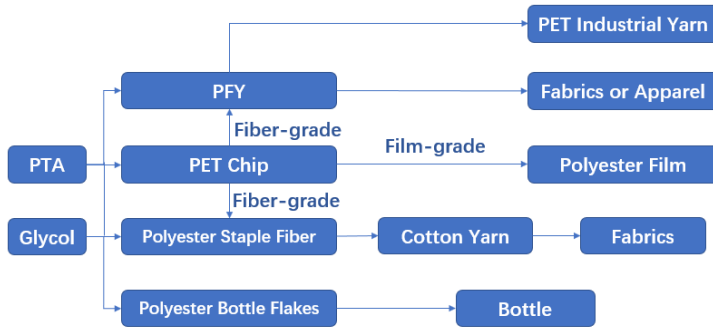


Chart XIV. Polyester Industrial Chain

Source: Research Institute of Founder CIFCO Futures

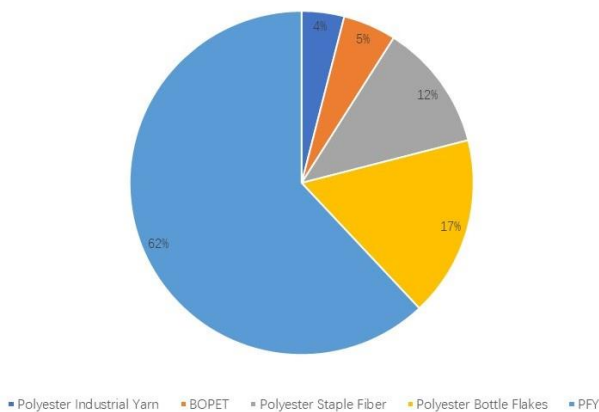


Chart XV. Output Proportion of Polyester Products

Source: Research Institute of Founder CIFCO Futures

II. Polyester Industry Status in China

Polyester was first produced from polycondensation of DMT (i.e. dimethyl terephthalate) and ethylene glycol by J. R. Winfield and J. T. Dickerson in 1941. Polyester was first put into industrial production by the US company DuPont. Polyester industry flourished around the world from 1960s to 1990s. In 1990s, polyester's development was transferred to Asia. China's polyester industry began in 1960s and boosted with the introduction of overseas techniques and equipment during the Reform and Opening up in 1980s. In 1990s, with the surge of private enterprises into polyester industry, the capacity greatly expanded. Entering the 21st century, China successfully developed domestic polyester plants, greatly reducing the CAPEX. With more plants being put into operation, China became the largest polyester-producing country around the world. A large number of polyester plants were put into operation during the year of 2011-2013 and supply surpassed demand. Due to excessive supply of polyester, the profit margin narrowed and operating rate of polyester plants remained low during the year of 2014 and 2015. In the second half of 2016, polyester encountered a new round of bullish cycle and the capacity was enhanced again. By the end of 2017, the polyester capacity reached 49.92 million tons. In 2018, the capacity was further enhanced and it

is estimated that another 5.14 million tons of polyester were put into production, with the growth rate reaching 10.9%.

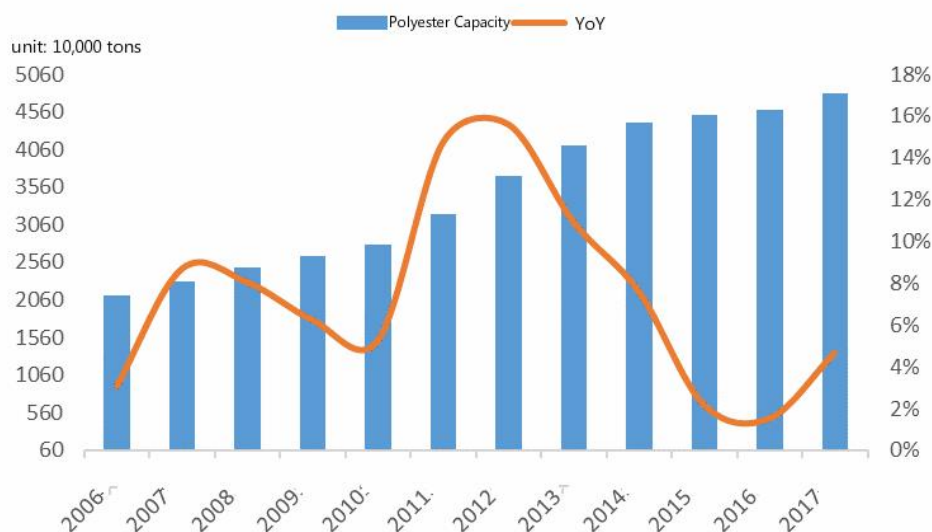


Chart XVI. Polyester Capacity

Source: SCI99.com, Research Institute of Founder CIFCO Futures

Chapter V. Contract & Delivery Standard of PTA Futures

I. PTA Futures Contract

Purified Terephthalic Acid Futures Contract	
Product	Purified Terephthalic Acid (PTA)
Contract Size	5 metric tons/lot
Price Quotation	CNY(RMB)/ton
Minimum Tick Size	2CNY/metric ton
Daily Price Limit	±4% of the settlement price of previous trading day; Refer to relevant provisions on daily price limit in the Measures for the Administration of Risk Control of Zhengzhou Commodity Exchange
Minimum Trading Margin	5% of contract value
Contract Delivery Month	January, February, March, April, May, June, July, August, September, October, November, December
Trading Hours	Monday to Friday (except public holidays) 9:00 a.m.-11:30 a.m. 1:30 p.m.-3:00 p.m. (Beijing time) Other trading hours stipulated by ZCE
Last Trading Day	10 th trading day of the delivery month

Last Delivery Day	12 th trading day of the delivery month
Grade & Quality	See Detailed Rules for Futures Delivery of Zhengzhou Commodity Exchange
Delivery Place	Designated delivery warehouses by ZCE
Delivery Method	Physical delivery
Product Code	TA
Listed Exchange	Zhengzhou Commodity Exchange

II. PTA Manufacturers & Inspection-Free Brand for Delivery

Region	No.	Manufacturer	Whether Inspection-Free	Abbreviation
China Mainland	1	Sinopec Yangzi Petrochemical Company Ltd.	Inspection-Free	Yangzi Petrochemical
	2	Sinopec Yizheng Chemical Fiber Co., Ltd.		Yizheng Chemical Fiber
	3	Sinopec Shanghai Petrochemical Company Limited		Shanghai Petrochemical
	4	Sinopec Luoyang Petrochemical Company Limited		Luoyang Petrochemical
	5	Oriental Petrochemical (Shanghai) Corporation		Oriental Petrochemical
	6	Ningbo Mitsubishi Chemicals Co., Ltd.	Inspection-Free	Ningbo Mitsubishi
	7	Zhejiang Yisheng Petrochemical Co., Ltd.	Inspection-Free	Yisheng Petrochemical
	8	Xianglu Petrochemicals Co., Ltd.	Inspection-Free	Xianglu Petrochemicals
	9	Zhuhai BP Chemicals Co., Ltd.		BP Zhuhai
	10	Formosa Chemicals Xingye (Ningbo) Co., Ltd.	Inspection-Free	Ningbo Formosa Chemicals
	11	Yisheng Dahua Petrochemicals Co., Ltd.	Inspection-Free	Yisheng Dahua
	12	Shishi Jialong Petrochemicals Textile Fiber Co., Ltd.	Inspection-Free	Jialong Petrochemicals
	13	Chongqing Pengwei Petrochemicals Co., Ltd.		Pengwei Petrochemicals
	14	Hengli Petrochemicals (Dalian) Co., Ltd.	Inspection-Free	Hengli Petrochemicals
	15	Jiaying Petrochemicals Co., Ltd.	Inspection-Free	Jiaying Petrochemicals
	16	Hainan Yisheng Petrochemicals Co., Ltd.		Hainan Yisheng
	17	Hanbang (Jiangyin) Petrochemicals Co., Ltd.		Jiangyin Hanbang
	18	Xianglu (Zhangzhou) Petrochemicals Co., Ltd.		Xianglu Zhangzhou
	19	Jiangsu Hialun Petrochemicals Co., Ltd.	Inspection-Free	Hailun Petrochemicals
	20	Ningbo Liwan Polyester Materials Co., Ltd.		Liwan Polyester
	21	Jiangsu Honggang Petrochemicals Co., Ltd.		Honggang Petrochemicals

	22	Fujian Fuhaichuang Petrochemicals Co., Ltd.		Fuhaichuang
China Taiwan	23	Formosa Chemicals & Fibers Corporation		Formosa Chemicals
	24	Tuntex Petrochemicals, Inc.		Taiwan Tuntex
	25	CAPCO		CAPCO
South Korea	26	Samsung General Chemicals Co., Ltd.		Samsung
	27	Gaohe Chemicals Corporation		Korea KP
	28	Samnam Petrochemicals Co., Ltd.		Korea Samnam
	29	Hyosung Co., Ltd.		Hyosung
	30	Taekwang Petrochemicals Co., Ltd.		Korea Taekwang

III. PTA Delivery Standard

The quality of PTA for delivery shall conform to the Purified Terephthalic Acid (PTA) for Industrial Use (GB/T 32685-2016).

Benchmark product for delivery: premium grade PTA conforming the Quality Standard of the Purified Terephthalic Acid (PTA) for Industrial Use (GB/T 32685-2016). Benchmark product for delivery must be products of PTA manufacturers recognized by Zhengzhou Commodity Exchange.

Chapter VI. Scheme for Introducing Overseas Traders to PTA

Futures Trading

The scheme for introducing overseas traders to PTA futures trading is composed of six sections, including trader suitability management, participation and filing requirements for overseas brokers, participation methods and account-opening procedures, clearing, delivery and risk control.

I. Trader Suitability Management

Traders shall fully evaluate their own economic strength, market and product cognition levels and risk control abilities and tolerance level in order to prudentially decide whether to participate in PTA futures trading or not.

Both overseas natural persons and institutional clients can participate in the trading of PTA futures. To participate in PTA futures trading, the traders whose accounts are opened before the implementation of the Measures for the Administration of Suitability Management of Traders Trading Specified Futures

Products of Zhengzhou Commodity Exchange are not required to take any additional actions, while the Chinese or overseas traders whose accounts are opened after the implementation of the Measures mentioned above shall firstly meet trader suitability requirements.

i. Suitability Requirements

1. Suitability Requirements for Institutional Clients

- (1) their relevant business personnel shall have basic knowledge of futures market, understand ZCE's business rules of specified products and have passed relevant tests approved by ZCE;
- (2) after daily settlement for five (5) consecutive trading days before applying for trading codes and permissions, the balances in their margin accounts shall be no less than CNY 100,000 or equivalent amount in foreign currency;
- (3) shall have domestic futures trading records in recent three (3) years; or have overseas futures trading records in recent three (3) years where the countries or regions shall have signed MOUs on regulatory cooperation with CSRC;
- (4) shall have established internal control system, risk management system and other relevant system for futures trading, and shall have established well-structured reporting system that could provide and timely update the information about department heads and other relevant business personnel in charge of futures trading to their account-opening institutions;
- (5) shall not have severely negative credit history or be prohibited from engaging in futures trading by regulatory authorities;
- (6) shall not be prohibited or restricted by any law, administrative regulation, rule or business rule of ZCE from engaging in futures trading;
- (7) other conditions prescribed by ZCE.

2. Suitability Requirements for Natural Persons

- (1) shall have full capacity for civil conduct;
- (2) shall have basic knowledge of futures market, understand ZCE's relevant business rules for specified futures products and have passed relevant tests approved by ZCE;
- (3) the balances of margin accounts after daily settlement shall be no less than CNY 100,000 or equivalent amount in foreign currency in five (5) consecutive trading days before applying for trading codes and trading permissions;
- (4) shall have domestic futures trading records in recent three (3) years; or have overseas futures trading records in recent three (3) years where the countries or regions shall have signed MOUs on regulatory cooperation with CSRC;
- (5) shall not have severely negative credit history or be prohibited from engaging in futures trading by regulatory authorities;
- (6) shall not be prohibited or restricted by any law, administrative regulation, rule or business rule of ZCE from engaging in futures trading;
- (7) other conditions prescribed by ZCE.

ii. Special Clients

Requirements for knowledge test, balances of margin accounts and trading records may not be applicable when account-opening institutions applying for trading codes or trading permissions for the special clients recognized by ZCE.

The special clients shall include:

- (1) professional investors satisfying the requirements mentioned in the Measures for the Suitability Management of Securities and Futures Investors;
- (2) domestic and overseas traders who have directly opened trading permissions or trading codes for specified futures products through a futures broker while still applying to other futures brokers to open trading permissions or trading codes for specified futures products;
- (3) domestic and overseas traders who have opened trading permissions or trading codes for specified futures products in other domestic exchanges;
- (4) other traders prescribed by ZCE.

II. Participation & Filing Requirements for Overseas Brokers

An overseas broker shall refer to a financial institution which is legally established outside the territory of the PRC and approved by the regulatory authority of the country (or region) where it is located (hereinafter “local regulatory authority”) to accept clients’ funds and trading orders to conduct futures trading for its clients’ in its own name.

i. Participation Requirements for Overseas Brokers

An overseas broker shall meet the following requirements to participate in the trading of specified futures products:

1. being a financial institution legally registered and established outside the territory of the PRC, and having been qualified by local regulatory authority to accept its clients’ funds and trading orders to conduct futures trading in its own name;
2. having operated for more than one (1) year;
3. accepting the supervision by local regulatory authority which has signed a MOU on regulatory cooperation with the CSRC;
4. having established sound corporate governance structure, internal control system and code of conduct for business operation;
5. having net capital of no less than CNY 30 million or an equivalent amount in foreign currency;
6. having the business facilities and technical systems which comply with the applicable technical standards and are in sound operation condition;
7. other requirements prescribed by ZCE.

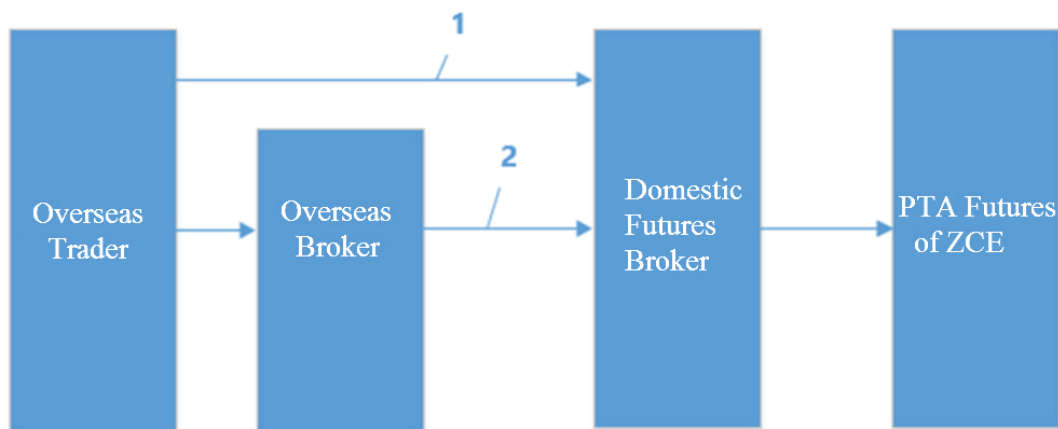
ii. Filing of Overseas Brokers

An FB member shall enter into a written appointment agreement with an overseas broker and the terms that the agreement shall contain can be seen in the Measures for the Administration of the Futures Trading of Futures Brokerage Members Appointed by Overseas Brokers. After entering into the agreement with an overseas broker, the FB member shall file with ZCE before conducting relevant business. If the FB member's filing request is approved, ZCE will inform the FB member of the result in writing and assign a filing number; if the filing request is rejected, ZCE will give a written explanation.

III. Participation Methods & Account-Opening Procedures

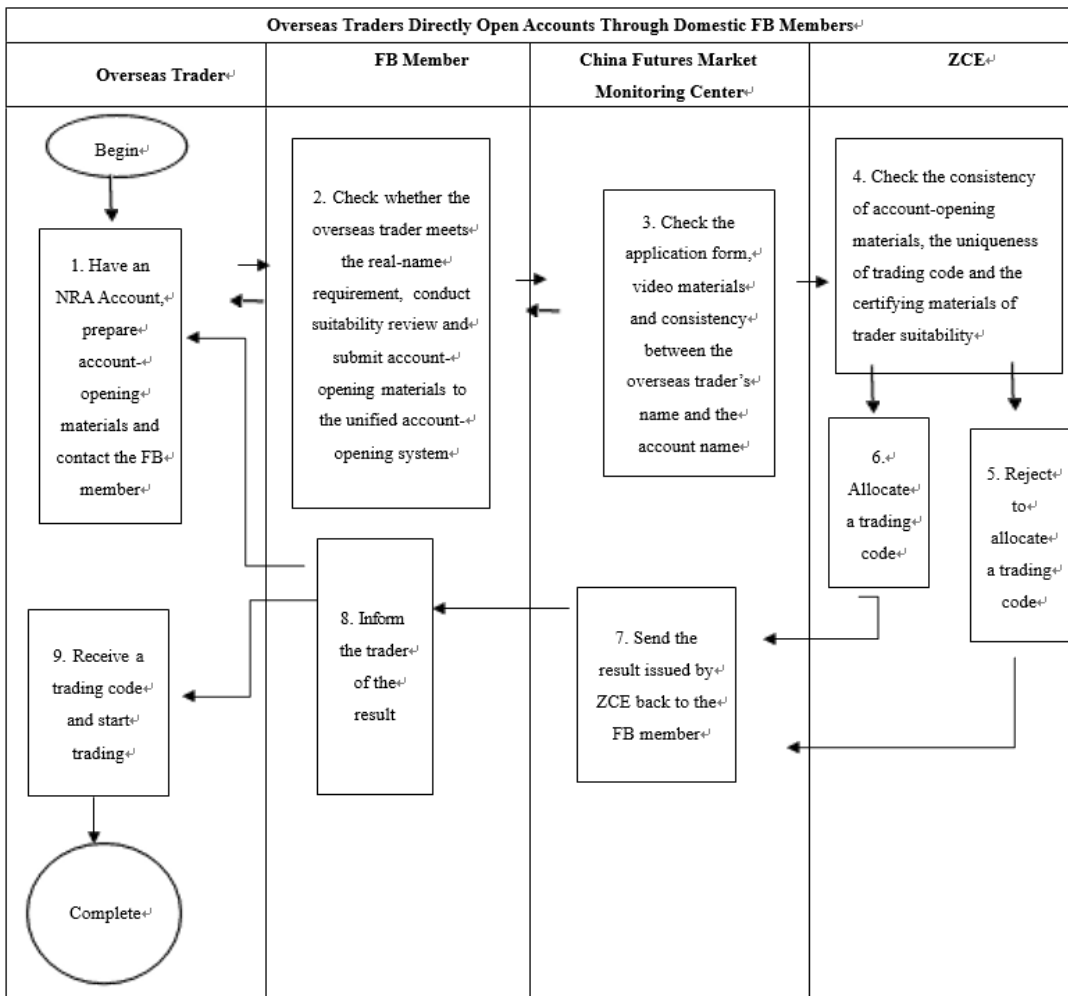
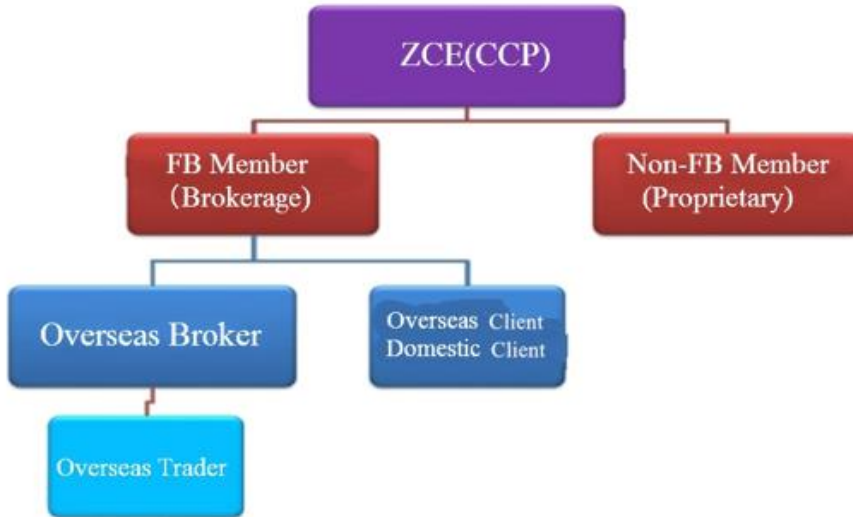
i. Participation Methods

Overseas traders who intend to participate in the trading of specified futures products may open accounts directly through the domestic FB members, or through the overseas brokers which appoint ZCE's FB members to open accounts for their clients, namely by adopting the indirect mode. While the overseas traders shall not open accounts by simultaneously taking both above methods at the same FB member, nor shall they appoint more than one overseas broker to open accounts at the same FB member.



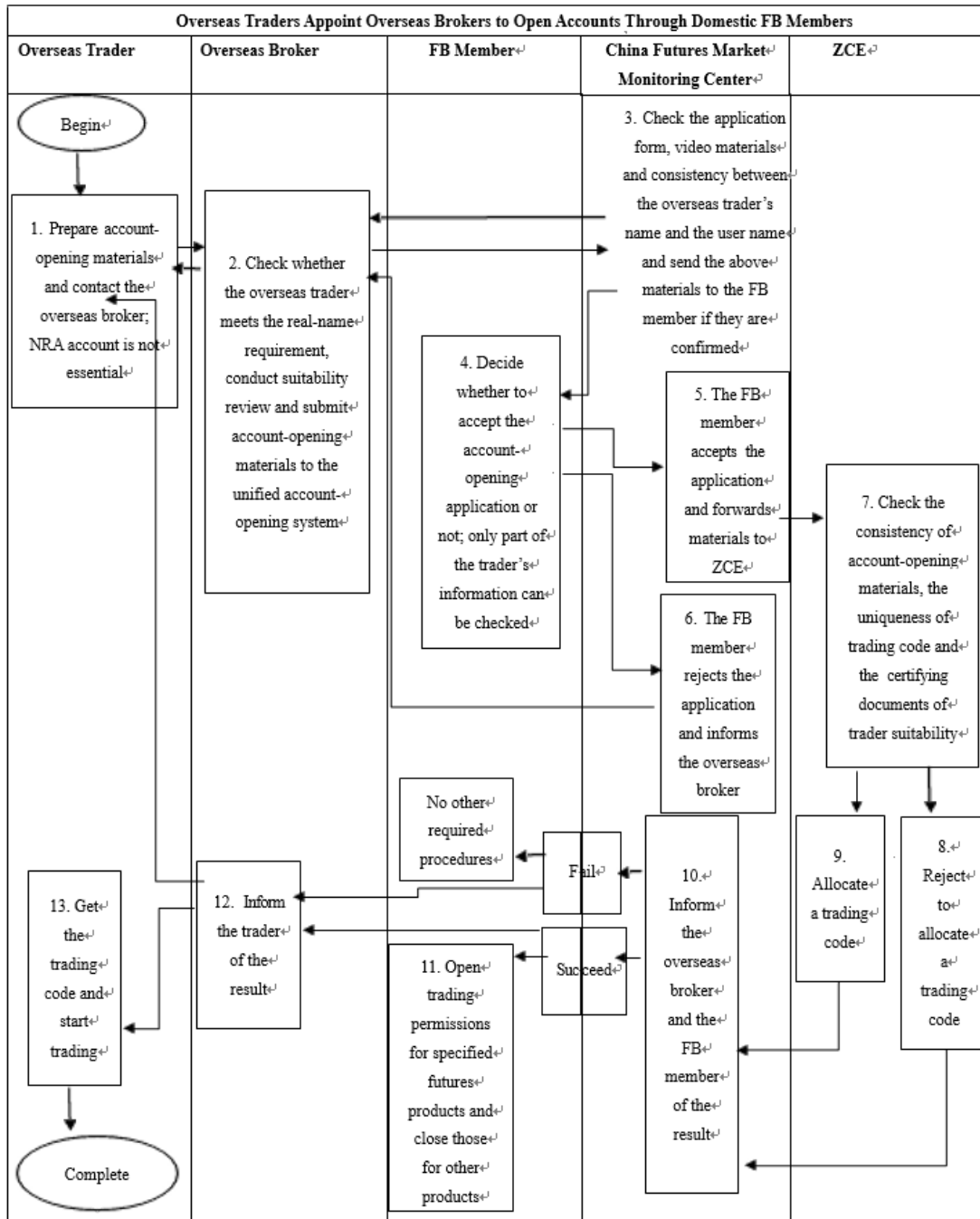
ii. Account-Opening Procedures

1. Procedures for Direct Account Opening by Overseas Traders



FB members and overseas brokers shall apply for and cancel trading codes and change the application materials of trading codes submitted by traders through the unified account-opening system according to the requirements of China Futures Market Monitoring Center.

2. Procedures for Indirect Account Opening by Overseas Traders



IV. Clearing

i. Fund Accounts

Overseas brokers and traders who directly open trading accounts through domestic futures brokers shall set up Renminbi clearing accounts and FX clearing accounts at designated futures margin depository banks (hereinafter “designated depository banks”). Overseas traders who appoint overseas brokers to open accounts through domestic FB members could open accounts in any overseas bank to conduct clearing with overseas brokers.

ZCE and futures brokers shall open FX clearing accounts and FX margin accounts at designated depository banks to conduct payment, receipt, exchange and transfer of funds related to specified futures product trading. ZCE and futures brokers shall report business related to specified futures products to local Administration of Foreign Exchange and declare relevant data such as balance of payment statistics on time.

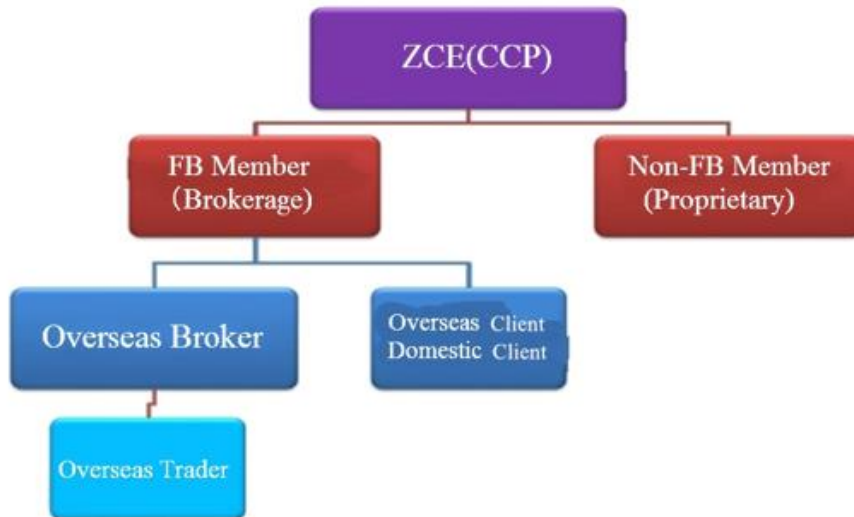
ii. Use of FX Funds

Overseas traders may pledge FX funds as margin. The type of currency, discount rate and applicable scope of FX funds pledged as margin shall be decided, adjusted and published by ZCE. Currently, the foreign currency that is permitted to be used as collateral for margin is U.S. dollar. The market value of the U.S. dollar pledged as margin shall be determined based on the central parity rate of Renminbi published by China Foreign Exchange Trade System (hereinafter “CFETS”) and the discount rate is 0.95.

The mark-to-market principle shall be applied when FX funds is pledged as margin. The market value of FX funds shall be determined before the market close of a day based on the central parity rate of Renminbi published by CFETS on the previous trading day. When conducting daily clearing, the market value of FX funds shall be re- determined based on the central parity rate of Renminbi of the day and the pledge amount of the FX funds shall be adjusted accordingly.

iii. Clearing Procedures

After the introduction of overseas traders to PTA futures trading, Renminbi will remain to be the basic clearing currency for the clearing conducted between ZCE and its members as well as between members and their clients. However, clients may choose U.S. dollar as the currency for fund withdrawal. The RMB funds converted from FX funds shall not be withdrawn in RMB.



ZCE shall conduct clearing for FB members and non-FB members. FB members shall conduct clearing for overseas and domestic clients as well as overseas brokers. Overseas brokers shall conduct clearing for overseas clients.

ZCE conducts clearing for its members in RMB on a daily basis and sends the clearing results to its members. When conducting clearing for their clients, members shall submit FX settlement and sale applications to depository banks for the clearing of profits and losses, service fees and delivery payment for commodities of the day, and the clearing is regarded as being completed after the depository banks finish the transfer of RMB and FX funds.

V. Delivery

i. Delivery Procedures

In order to fulfill the delivery needs of PTA overseas traders, ZCE will take the following three measures: (1) introducing export service providers; (2) preferentially allocating bonded warehouse receipts to overseas buyers; (3) solving the problem that overseas buyers are not able to disposing of duty-paid warehouse receipts by putting the duty-paid receipts up for an auction on ZCE's comprehensive business platform, and the profits and losses of the auction shall be borne by overseas buyers.

1. Before Delivery Matching

An overseas trader who is willing to obtain domestic duty-paid commodities may choose to sign an agreement with an export service provider. Before delivery matching, the overseas trader may close out long positions and the export service provider may open long positions at the market price. After the duty-paid receipts are delivered to the export service provider, the provider may cancel the receipts and the commodities can be exported to the overseas trade. Costs arising from transportation, loading and unloading as well as customs clearance and tally charge shall be paid by

the overseas trader.

2. After Delivery Matching

If overseas traders have not signed agreements with export service providers and enter the delivery matching, the three-day delivery procedures shall be applied. When conducting centralized matching on the last trading day, ZCE will preferentially allocate PTA bonded warehouse receipts to overseas buyers, and whoever holds the positions for a longer time among the overseas buyers shall be allocated with PTA bonded warehouse receipts in priority. If an overseas trader is matched with a domestic seller who does not hold bonded warehouse receipts, ZCE will liquidate the positions of the overseas buyer with other domestic sellers at the settlement price of the day and clear profits and losses, and the domestic seller's duty-paid receipts shall be auctioned by ZCE on the comprehensive business platform and the profits and losses of the auction shall be borne by the overseas trader.

ii. Clearing of Bonded Delivery

1. Bonded Delivery Payment

The buying members shall pay the unpaid delivery payment in full before 9:00 a.m. on the delivery day.

Payment for commodities covered by registered bonded receipts shall be calculated as:

bonded delivery price × quantity of commodities covered by registered bonded receipts × delivery unit;

The bonded delivery price in the above formula shall be calculated as:

$$[(\text{delivery price} - \text{relevant expenses}) / (1 + \text{import VAT rate}) - \text{consumption tax}] / (1 + \text{import tariff rate})$$

Relevant expenses herein include import declaration fees, customs censoring charges and agent service charges, and the expenses shall be published by ZCE separately. Consumption tax shall be levied based on the quantity of delivered commodities and tariff shall be collected based on the price of delivered commodities.

ZCE will, after the market close of the delivery day, deliver the registered bonded receipts submitted by the selling members to the buying members, transfer the delivery payment to the selling members and issue Bonded Delivery Clearing Statement (for Tax and Bookkeeping Uses Only) to the sellers and Bonded Delivery Clearing Statement (for Bookkeeping Use Only) and Bonded Delivery Clearing Statement (for Customs Declaration Use Only) to the buyers. The Bonded Delivery Clearing Statements shall state price information, names of the buyers and sellers, names of the buying members and selling members, place of production, actual quantity, delivery time and delivery method. The delivery method shall be marked with “delivery”.

2. Circulation of Invoices of Bonded Delivery

When engaging in the delivery of PTA by means of registered bonded receipts, the domestic

sellers shall issue normal VAT invoices to the selling members and the overseas sellers or the overseas brokers shall issue relevant payment receipt vouchers to the selling members; the selling members shall issue normal VAT invoices to ZCE; ZCE will issue normal VAT invoices to the buying members; the buying members shall issue normal VAT invoices to the buyers and overseas brokers.

The selling members shall deliver normal VAT invoices to ZCE before the market close of the 7th trading day after the delivery day. If the selling members fail to do so, ZCE will deduct in advance 5% of the payment for commodities as a penalty and deal with the situation according to the Detailed Rules for Futures Delivery of Zhengzhou Commodity Exchange and Detailed Rules for Futures Clearing of Zhengzhou Commodity Exchange.

VI. Risk Control

Overseas traders participating in PTA futures trading shall follow the same risk control measures applicable to domestic clients, which includes margin requirement, price limit, position limit, trading limit, large position reporting requirement and forced position liquidation. ZCE will treat overseas and domestic traders equally in the identification of abnormal trading behaviors and accounts involving actual controlling relationships.

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