ITALIAN TRADE AGENCY
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CHINA'S MACHINE TOOL INDUSTRY, MARKET AND REGULATIONS

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Table of Contents

4. Trade Exchange in the Machine Tool Industry between Italy and China (May 2024)

5. Tenders and Bids in China (Sep 2024)

1. Machine Tool Industry in China

1.1 Overview of China's economy, market performance and main indicators of the machine tool industry

1.1.1 Main economy indicators (Summary of the highlights)

Rapid growth in industry output, in particular equipment manufacturing and high-tech industries

According to data from the Chinese Bureau of Statistics, in July 2024, the value-added of industries above the designated size rose by 5.1% year-on-year on a broad basis, down 0.2 percentage points from the previous month. By industry category, the value-added the mining industry increased by 4.6% year-on-year, the manufacturing industry increased by 5.3%, and the electricity & heat & gas & water supply industry increased by 4%. The value-added of the equipment manufacturing industry and hi-tech industry increased by 7.3% and 10%, up 0.4 and 1.2 percentage points, respectively. By economic type, the value-added of state-owned enterprises increased by 3.5% year-on-year; joint-stock enterprises increased by 5.4%; and foreign enterprises increased by 4.2%. By product type, the output of new energy vehicles, integrated circuits, and 3D printing equipment displayed a 27.8%, 26.9% and 25.3% year-on-year growth respectively.

Enterprises above the designated size	**+5.1%**
By industry	
Mining industry	+5.3%
Equipment manufacturing industry	+7.3%
Hi-tech industry	+10%
By product type	
New energy vehicles	+27.8%

Integrated circuits	+26.9%
3D printing equipment	+25.3%

Moderate rebound of consumer prices

In July, national consumer prices (CPI) rose by 0.5% year-on-year, showing an increase of 0.3 percentage points compared to the previous month. By category, food, tobacco & alcohol prices rose by 0.2% year-on-year, clothing prices rose by 1.5%, housing prices rose by 0.1%, and living goods & services prices rose by 0.7%, with a slight decline in transportation & communication prices by 0.6%. The core CPI, after deducting food and energy prices, rose by 0.4% year-on-year.

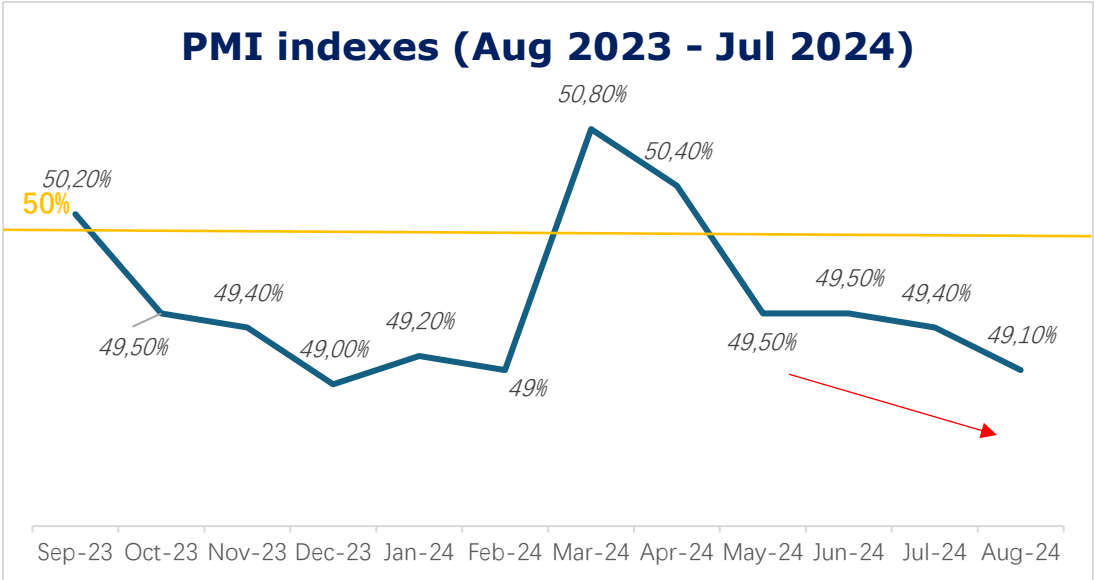
CPI	**+0.5%**
Food, tobacco & alcohol	+0.2%
Housing	+0.1%
Living goods & services	+0.7%
Communication & transportation	-0.6%

Generally stable employment situation, despite a seasonal increase in urban unemployment rate

According to data disclosed by the National Bureau of Statistics, the national urban unemployment rate stood at 5.2%, down 0.1 percentage points year-on-year, but 0.2 percentages points higher than the previous month. The unemployment rate for local household labour force was 5.1%, the unemployment rate for immigrant(foreign) household labour force was 5.2%, The unemployment rate for labour force in 31 big cities was 5.3%, down 0.1 percentage points year-on-year. The average weekly working hours of employed persons in enterprises nationwide was 48.7 hours.

Manufacturers PMI Index (August 2024)

In August 2024, the Purchasing Manager Index (PMI) for the manufacturing industry is 49.1%, 0.3 percentage points lower than the previous month, indicating an outlook of moderate decline. Possible reasons for the decline are: 1) August is the traditional "light season" (periods of the year with fewer business activities). 2) Regional natural disasters, such as flooding and extreme weather events, inflict adverse impacts on industry operations. 3) Weak downstream demands as a result of downward economy pressure.



**Notes: A PMI index over 50 represents growth or expansion within the manufacturing sector compared with the prior month. A reading under 50 represents contraction, and a reading at 50 indicates an equal balance between manufacturers reporting advances and declines in their business.*

It is worth mentioning that the PMI index for large enterprises was 50.4%, 0.1 percentage points lower than the previous month but still signalled an expansion in terms of production activities (amid the overall negative outlook). However, the PMI index for medium and small enterprises was 48.7% and 46.4%, respectively, showing a relatively steep decline.

PMI and component indexes (%) of China's manufacturing industry

	PMI	Production	New order	Raw material inventory	Employee	Supplier delivery time
Sep 2023	50.2	52.7	50.5	48.5	48.1	50.8
Oct 2023	49.5	50.9	49.5	48.2	48.0	50.2
Nov 2023	49.4	50.7	49.4	48.0	48.1	50.3
Dec 2023	49.0	50.2	48.7	47.7	47.9	50.3
Jan 2024	49.2	51.3	49.0	47.6	47.6	50.8
Feb 2024	49.1	49.8	49.0	47.4	47.5	48.8
Mar 2024	50.8	52.2	53.0	48.1	48.1	50.6
Apr 2024	50.4	52.9	51.1	48.1	48.0	50.4
May 2024	49.5	50.8	49.6	47.8	48.1	50.1
Jun 2024	49.5	50.6	49.5	47.6	48.1	49.5
Jul 2024	49.4	50.1	49.3	49.9	48.3	49.3
Aug 2024	49.1	49.8	48.9	47.6	48.1	49.6

- The manufacturing industry display a moderate decline on an overall basis.
- The manufacturing industry is experiencing a mild recession in production.
- The market new order is, to some degree, lower than the previous level.
- The inventory of raw materials is significantly narrowing down.
- The overall employment situation is undergoing an observable drop.
- In comparison to the previous month, the delivery time for raw

materials of suppliers shows a moderate extension.

1.1.2 Machine tool industry main indicators

- Data from the Chinese Machine Tool Industry Association: From January to July 2024, the operating income of key contact enterprises decreased by 3.6% year-on-year, and the total profit decreased by 14.7% year-on-year. However, new orders metal-forming machine tools increased by 3.4% year-on-year.
- Data from the National Bureau of Statistics: From January to July 2024, national enterprises above the designated size achieved the production of 3880 thousand sets of metal-cutting machine tools (year-on-year increase of 6.6%), and 97 thousand sets of metal-forming machine tools (year-on-year increase of 3.2%).
- Data from the China customs: From January to July 2024, the import and export of machine tools amounted to 18.11 billion USD collectively, showing a year-on-year decline of 2.6%. Among them, imports amounted to 5.91 billion USD, down 9.8% year-on-year; exports amounted to 12.2 billion USD, up 1.4% year-on-year.

From January to July 2024	Total amount	Year-on-year
The export of machine tools	12.2 billion USD	+1.4%
The import of machine tools	5.91 billion USD	-9.8%
The total amount of import and export	18.11 billion USD	-2.6%

- Metal-cutting machine tool production across regions in July 2024

Location	Jun (1,000 units)	Jan-Jun Total (1,000 units)
Liaoning	0.24	1.63
Jiangsu	0.67	4.13

Zhejiang	*1.93*	*12.79*
Anhui	0.11	0.81
Fujian	0.11	0.76
Shandong	0.60	4.27
Guangdong	1.03	8.52
Yunnan	0.26	1.88
Shaanxi	0.10	0.88

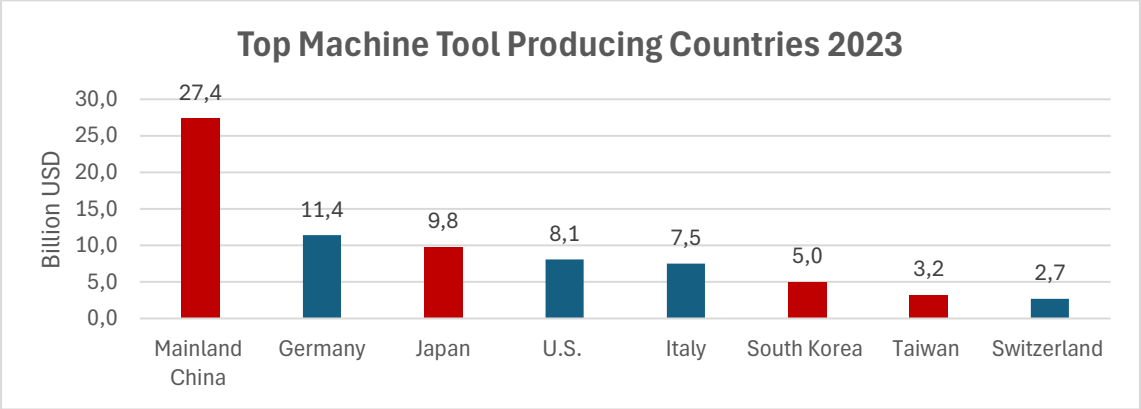
Source: CMTBA and National Bureau of Statistics in China

1.2. Overview of the foreign machine tool manufacturers in China (Other than China Mainland ones)

1.2.1 Asia's machine tool market landscape

The Asia Pacific region dominates the global machine tool landscape both in terms of the market size and production volume. In 2023, the revenue of Asia Pacific machine tool market stood at $45.39 billion, accounting for 55.5% of the worldwide total, according to US-based Grand View Research Inc. The region was expected to maintain the largest share of the global machine tool market in the coming years.

Among the top eight producing countries (and regions) in the world, half are from the Asia-Pacific region, specifically Mainland China, Japan, South Korea, and Taiwan (China), with Mainland China taking the lead in terms of revenue, followed by Japan, South Korea, and Taiwan (China).



Source: World Machine Tool Survey, Gardner Business Media, In3act Analysis

Compared to Japan, South Korea, and Taiwan (China), mainland China holds a leading position in terms of production volume and market size. However, it still faces challenges in achieving the precision and technological sophistication found in its Japanese counterparts. Meanwhile , machine tool companies in mainland China are mostly large state-owned enterprises, while companies in Japan, South Korea and Taiwan (China) are mostly small and medium-sized enterprises, therefore more flexible and easy to adapt to market changes.

1.2.2 Japanese machine tool producers in China

Japanese machine tools are renowned for global leading technology and high industry standards, particularly in CNC machine tools and automation technology, with companies such as Mazak, Makino, Okuma, and DMG Mori at the forefront.

Company	Background & Presence in China
Mazak Mazak	▪ Founded in 1919, MAZAK is a global leading manufacturer known for its high-speed and high-precision CNC machines, including lathes and multi-tasking milling centers. It has a market significant presence with multiple manufacturing plants and extensive customer support network worldwide. ▪ Mazak's first entry into the Chinese market was in the early 2000s, and since then began to set up technical centers (Guangzhou, Shanghai, Dalian) and gradually expanded its investment in China. ▪ It has now established 2 factories in China located in Liaoning and Ningxia provinces respectively and has become one of the major players in the Chinese market. ▪ It is one of the first representatives of Japanese machine tool manufacturers to enter China and achieve success.

Makino	▪ Makino was founded in 1937 and is one of the earliest manufacturers of CNC milling machines and machining centers in Japan. ▪ Makino established Makino Machine Tool (China) Co., Ltd. in Kunshan City, Jiangsu Province, China in 2002, marking its official entry into the Chinese market. ▪ Makino has established multiple technical centers in China to support customer needs and provide training & technical support. ▪ As China's manufacturing industry continues to upgrade, Makino Machine Tool continues to adjust its product lines to meet the needs of different industries, especially in the fields of aerospace, automotive and medical equipment.
Okuma	▪ Okuma Corporation, founded in 1898, is Japan's leading CNC machine tool manufacturer, known for its high-precision and high-efficiency machine tools. ▪ The JV with Beijing Beiyi Machine Tool Co., Ltd and BYJC-Okuma (Beijing) Machine Tool Co., Ltd. was established in 2002 to produce CNC lathes and machining centers. In 2007, Okuma Machinery (Shanghai) Co., Ltd. was established, and maintenance service centers & offices were established in Guangzhou, Jinan, Dalian, Wuhan, Chongqing, Xi'an, etc.. In 2019, Okuma (Changzhou) Machine Tool Co., Ltd. was established to produce certain machine tool series.
DMG MORI	▪ DMG MORI was formed by the merger of Germany's DMG Company (formerly known as Gildemeister AG) and Japan's Mori Seiki Company. The two parties cooperated closely in the fields of R&D, production and sales, and together adopted the name "DMG MORI". ▪ DMG MORI established its first subsidiary MORI SEIKI (SHANGHAI) CO., LTD. in Shanghai, China in 2001, as an official entry into the Chinese market. ▪ Currently, DMG MORI has more than 30 sales and service offices in China.

1.2.3 Taiwanese (China) machine tool producers in China

Taiwanese (China) machine tools have achieved high applicability and holding a significant share in the mid-tier market, especially within Mainland China.

Company name	Background & Presence in China
Tongtai 	▪ Tongtai Machine & Tool Co., Ltd. was established in 1969 and is headquartered in Kaohsiung, Taiwan (China). ▪ In the early 1990s, Tongtai expanded into the Chinese market. In 2002, Tongtai established a production base in Suzhou, China. ▪ Tongtai has established multiple technology centers in Mainland China and continues to optimize its product lines, launching high-end machine tools demanded by Mainland China's manufacturing industry, such as 5-axis machining centers and multi-function compound processing machines.
Victor Taichung 	▪ Taichung Precision Machinery, founded in 1954, is a well-known machine tool manufacturer in Taiwan (China), famous for its production of positioning machine tools. ▪ Taichung started the investment in Mainland China in 1992, and has established its subsidiaries in Shanghai, Tianjin and Guangzhou.
Johnford 	▪ Established in 1984, Johnford entered the Mainland China market in the early 1990s. ▪ Johnford has established multiple production bases in Mainland China, among which the factory in Suzhou focuses on the production of high-precision CNC machine tools.
FFG (Fair Friend Group) 	▪ Founded in 1979 and headquartered in Taiwan (China), it is a global leading machine tool manufacturer group. ▪ FFG entered the Chinese market in 1993 and established Hangzhou Youjia Precision Machinery Co., Ltd. ▪ Apart from Asia market, FFG has also further expanded its market presence and technological capabilities in Europe through the acquisition of companies such as Italy's Grinding Technology S.R.L. and Industria Meccanica Applicazioni Speciali S.r.l.

1.2.4 South Korean machine tool producers in China

South Korean machine tools are gradually closing the technology gap with Japan; offering products with relatively lower prices, which attracts many small and medium-sized enterprises.

Company name	Background & Presence in China
Doosan	▪ Doosan Machine Tools, now rebranded as DN Solutions, was founded in 1976 and is the largest machine tool manufacturer in South Korea. ▪ In 2023, Doosan Machine Tools ranked first in the Korean machine tool market with a market share of 49.7%. ▪ Doosan Machine Tools (China) Co., Ltd. was registered and established on July 1, 2003 in Shandong province.
HYUNDAI WIA	▪ Hyundai WIA, originally established as Samwon Manufacturing Works in 1976, has evolved into a significant player in the machine tools industry. ▪ The company established Wia Automotive Parts Co., Ltd. in Jiangsu Province in 2005 ▪ Until today, Hyundai WIA has been operating multiple facilities across China.
Hwacheon	▪ Founded in 1952, Hwacheon is Korea's first machine tool manufacturer and has a reputation for producing high-quality CNC lathes and milling machines. ▪ Hwacheon entered the Chinese market in the early 2000s. Hwacheon Machine Tool's main production base in China is Hwacheon Machinery (DongGuan) Co., Ltd., located in Chang'an Town, Dongguan, Guangdong Province.

1.2.5 Chinese Organization business license assessment, main products and downstream applications

Name of the Chinese HQ	Year of Establishment & Province	Registered Capital	Main products	Application sectors
Yamazaki Mazak (China) Co., Ltd. 山崎马扎克（中国）有限公司	2013 Shanghai City	103.5 million US dollars	▪ CNC lathe ▪ Compound turning and milling machining center ▪ Vertical machining center ▪ Horizontal machining center suitable for ▪ CNC laser system	▪ Automotive ▪ Construction machinery and agricultural machinery ▪ Consumer electronics ▪ Energy ▪ Medical
Makino Machine Tool (China) Co., Ltd. 牧野机床（中国）有限公司	2002 Jiangsu Province	45 million US dollars	▪ Machining center ▪ EDM machine ▪ CNC milling machine ▪ Wire cutting machine	▪ Automotive ▪ Aerospace ▪ Mould ▪ Electronic Products
Okuma Machine Tool(Shanghai) Co., Ltd. 大隈机械（上海）有限公司	2007 Shanghai City	900 million yen (6.2847 million US dollars)	▪ Horizontal CNC lathe ▪ Vertical machining center ▪ GENOS series machine tools: This series focuses on the needs	▪ Aerospace ▪ Automotive ▪ Mould Medical ▪ Semiconductor

			of small and medium-sized enterprises and is cost-effective and reliable.	
DMG Mori DMG Mori Seiki Machine Tool Trading Co., Ltd.	1996 Shanghai City	12.85 million US dollars	▪ CNC lathe ▪ CNC milling machine ▪ CNC grinder	▪ Aerospace ▪ Automotive ▪ Electronic communication ▪ Medical equipment
Suzhou Dongyu Machine&Tool Co.,Ltd. (Tongtai) 苏州东昱精机有限公司	2003 Jiangsu Province	25 million US dollars	▪ Vertical machining center ▪ Horizontal machining center ▪ CNC lathe ▪ Compound machining center ▪ PCB processing machine ▪ Laser processing machine ▪ Metal laminated manufacturing equipment	▪ Automotive ▪ Aerospace ▪ Electronics ▪ Medical ▪ Moulds
Taichung Prevision Machinery (Shanghai) Co., Ltd (Victor Taichung)	2011 Shanghai City	26 million US dollars	CNC lathes Integrated processing machines ▪ Plastic injection	▪ Automotive ▪ Aerospace ▪ Molds

台中精密机械（上海）有限公司			molding machines	
Johnford Trading (Shanghai) Co., Ltd. 侨富达贸易（上海）有限公司	2006 Shanghai City	0.28 million USD	▪ Turning machine tools ▪ Milling machine tools ▪ Gantry machine tools ▪ Moving column horizontal boring and milling machine	▪ Aerospace ▪ Defense ▪ Heavy industry ▪ Mining
Youjia International CNC Machine Tool Co., Ltd. (FFG) 友嘉国际数控机床有限公司	1993 Zhejiang Province	52.380952 million US dollars	▪ Vertical lathe ▪ Horizontal lathe ▪ Vertical machining center ▪ Horizontal machining center ▪ Gantry machining center ▪ Grinder ▪ Rotary multi-station machine tool	▪ Automotive ▪ Aerospace ▪ Ship building ▪ Rail ▪ Energy
Doosan Machine Tools (China) Co., Ltd. 斗山机床(中国)有限公司	2003 Shandong Province	10 million US dollars	▪ CNC boring and milling machining center ▪ Five-axis machining center	▪ Mould ▪ Automotive ▪ Valves ▪ Aerospace ▪ Railways

			▪ Gantry machining center ▪ Horizontal machining center ▪ Vertical machining center ▪ CNC lathe ▪ Turning and milling compound center ▪ Automation line	
Jiangsu Hyundai Wia Co., Ltd. 江苏现代威亚有限公司	2004 Jiangsu Province	100.7 million US dollars	▪ Lathe ▪ Vertical machining center ▪ Horizontal machining center	▪ Automotive ▪ Defense
Hwacheon Machinery (Dongguan) Co., Ltd. 货泉机械（东莞）有限公司	2017 Guangdong Province	3 million RMB (0.4238 million US dollars)	▪ Vertical machining center ▪ Five-axis machining center ▪ CNC lathe (vertical lathe, horizontal lathe) ▪ Turning and milling machine	▪ General machinery manufacturing ▪ Molds ▪ Semiconductors ▪ Automotive ▪ Medical

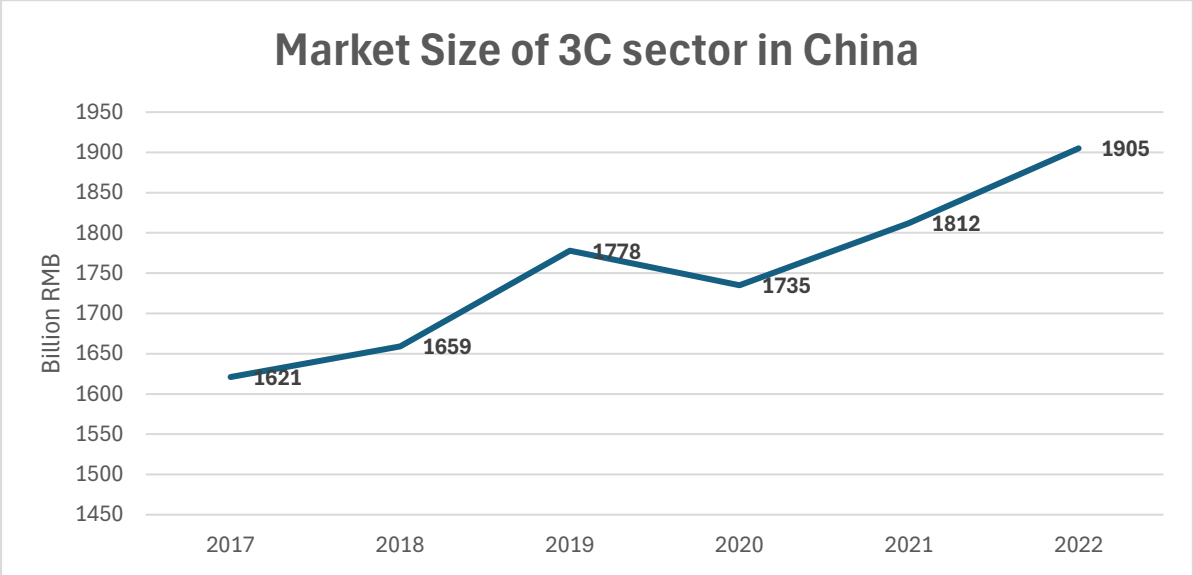
1.3 Overview of the downstream industries, geographical distribution and the demand trends

1.3.1 Major downstream application overview: 3C (computers, communications, and consumer electronics) industry

The 3C sector, which includes consumer electronics, computer, and communication, has been a significant downstream market for (CNC) machine tools with various machining processes, such as:

- Shell processing: CNC machine tools could accurately process the shells of 3C products such as mobile phones and tablet computers, to achieve sophisticated appearances and improved parts properties.
- Structural parts processing: Many structural parts inside 3C products, such as metal frames and brackets, also required precision processing by CNC machine tools to ensure the dimensional accuracy and surface quality.
- Precision parts processing: Precision parts in 3C products (connectors, micro motors, etc.) required micro-level processing by CNC machine tools.

From 2017 to 2022, the scale of China's 3C industry exhibited an overall expansion (increasing from 1,612 billion yuan to 1,905 billion yuan with a CAGR of 11.8%), aside from a slight decline in 2020 due to the adverse impacts of COVID-19. This indicated a steady and orderly development of the domestic 3C industry.



Source: Public data, China IRN, In3act Analysis

1.3.2 Geographical distribution of China’s 3C production

According to SASAC (State-owned Assets Supervision and Administrative Committee of State Council), China manufactured over 70% of 3C products worldwide, with domestic players like Huawei, Xiaomi, and Lenovo, as well as international giants like Apple, Dell, Samsung and Microsoft carving up the market.

3C industries were concentrated in coastal regions, such as East and South China. Meanwhile, inland and western areas are gradually catching up.

- Southern China: especially Guangdong Province, was an important birthplace of the 3C industry. In particular, Shenzhen city is a world-renowned electronic product manufacturing center and had attracted large investments from both domestic and foreign companies.
- Eastern China, including Shanghai, Jiangsu and Zhejiang: another core area of China's 3C industry, with a high degree of economic development and strong market demand. This region also has many well-known 3C companies and a complete industrial chain.
- Northern China, including Beijing, Tianjin and Hebei had a certain number of 3C companies. As one of country's technology and innovation centers, Beijing has attracted many high-tech enterprises and startups.
- Central China, containing provinces such as Hubei and Henan had a been actively developing the 3C industry in recent years, especially in the electronics manufacturing & assembly sector.
- Southwestern regions such as Sichuan and Chongqing are gradually developing 3C industries, especially in the fields of consumer electronics and smart hardware.

The HQ locations of leading 3C manufacturers:

Company	HQ	Main Production Base
Xiaomi	Beijing	Beijing
Huawei	Shenzhen, Guangdong	Guangdong
Lenovo	Beijing	Beijing, Hubei, An'hui ， Guangdong
OPPO	Dongguan, Guangdong	Guangdong
VIVO	Dongguan, Guangdong	Guangdong，Chongqing
ZTE	Shenzhen, Guangdong	Guangdong，Jiangsu
TCL	Huizhou, Guangdong	Guangdong，Sichuan
APPLE	Beijing	Henan, Guangdong

DELL	Xiamen, Fujian	Fujian, Sichuan, Jiangsu
SAMSUNG	Beijing	Shaanxi
Microsoft	Beijing	Fujian, Jiangsu, Chongqing
Haier	Qingdao, Shandong	Shandong
Midea	Foshan, Guangdong	Guangdong
Hisense	Qingdao, Shandong	Shandong

1.3.3 Demand trends of 3C industry

- With the wide adoption of emerging digital technologies such as 5G communications, artificial intelligence (AI), and the Internet of Things (IoT) as well as new materials such as titanium alloys, laser processing materials and composite materials, the intelligence level and quality of 3C products is continuously advancing, which also drove up consumers' expectations on the products.
- It came as no surprise that the application of new technologies and materials in 3C products created a rigid demand for CNC equipment. For instance, the use of titanium alloys in the mobile phone manufacturing process imposed stringent requirements on the performance of machine tools and their accessories, such as cutting tools and spindles.
- It is worth noting that some international 3C producers (i.e. Apple, Dell) had shifted their industrial chains to Southeast Asia due to increased global trade uncertainty, lower labour costs and more flexible supply chain arrangement. However, China still retains the unique advantages with its established manufacturing system, technological advancement and large consumer base.

2. China's energy policy trends

2.1. China's energy transition, carbon neutrality, energy conservation and carbon reduction schemes

Energy transition

In the past 10 years, China's energy transition scheme had been guided by the following principles:

- High-quality economic and social development
- Developing a high-level protection of the ecological system
- Keeping up with the global energy transition trend

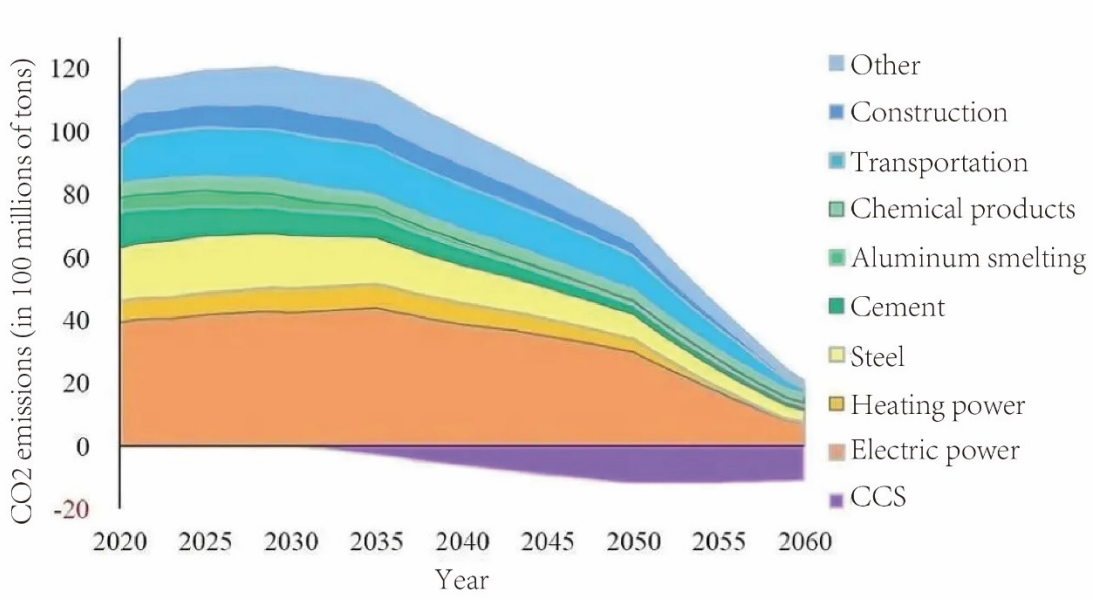
Carbon Neutrality

The Center for Energy and Environmental Policy Research at Beijing Institute of Technology predicted that under a scenario of moderate socio-economic development and a natural carbon sink of 1 billion tons per year, achieving carbon neutrality safely and at low cost would require reducing CO2 emissions, both from energy systems and industrial processes (e.g steel, chemical and transportation), to around 2.1 billion tons per year until 2060. That is to say, the Carbon Capture and Storage (CCS) technology would need to capture over 1.1 billion tons of CO2 per year.

China's Path to Carbon Neutrality

2025-2030: accumulated carbon emissions reached the peak at approximately 12.2 billion tons of CO2.
2030-2050: with the large-scale deployment of CCS technology, emissions were projected to decline at an annual rate of 4% on average.
2050-2060: the carbon emission decline would accelerate, sitting at an annual rate of over 15%. By 2060, the emission should decrease to 0.6-2.2 billion tons.
(CCS technology was projected to function a cumulative capture of over 24 billion tons of CO2 by 2060)

Accumulated carbon emissions by industry (with varying carbon peak times)



Accumulated carbon emissions by industry

Source: Center for Energy and Environmental Policy Research, Beijing Institute of Technology

Energy Conservation & Carbon Reduction

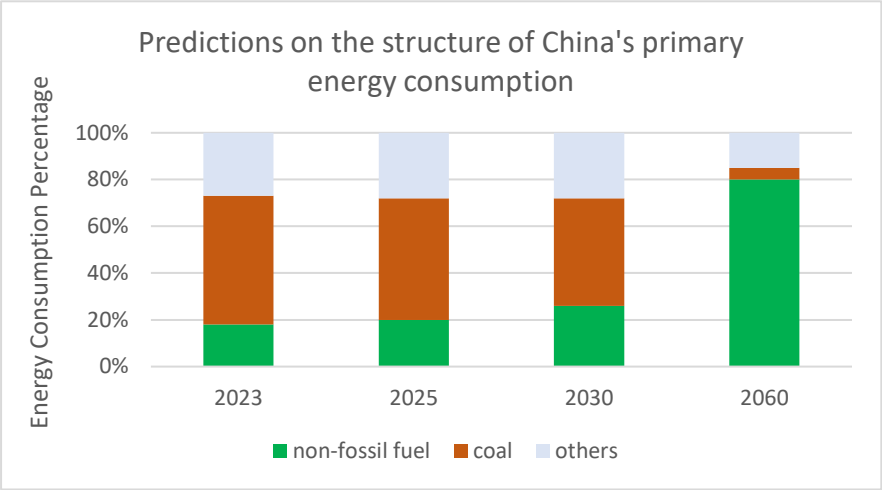
- Background: China's energy landscape

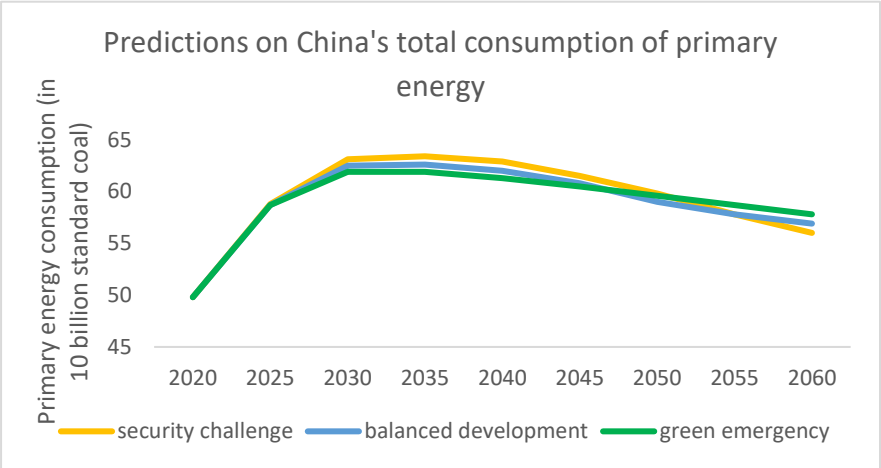
A rebound of oil consumption in China could be observed after the pandemic. The oil consumption reached 760 million tons in 2023 and was expected to peak at 800 millions tons in the middle of the 14th Five-Year-Plan timeframe (2021-2025), before declining to 280 million tons by 2060. The decline would be partly attributed to the rise of new energy vehicles, making oil gradually lose the role as a transportation fuel.

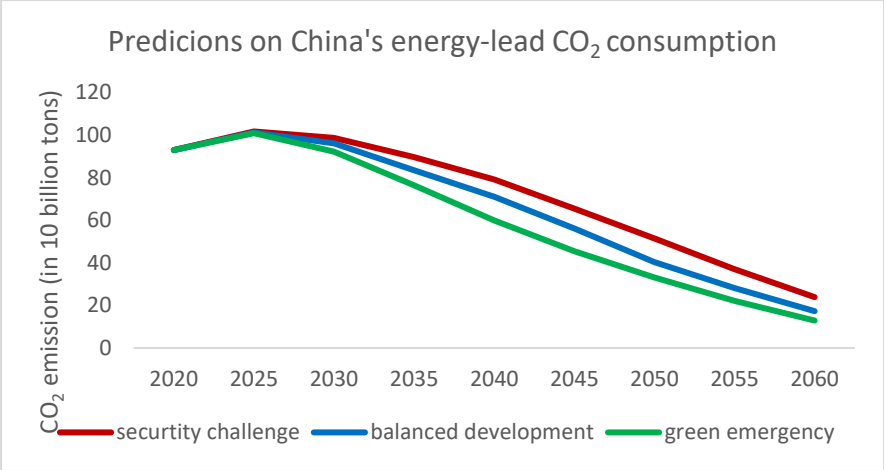
The natural gas consumption was significantly growing in the short term, hitting 394.53 billion cubic meters in 2023. It was expected to peak at 610 billion cubic meters around 2040 (with its market share rising to 13%), before decreasing to 400 billion cubic meters by 2060. As a key transition fuel, the demand of natural gas would depend on the overall energy security and risks in the energy transition.

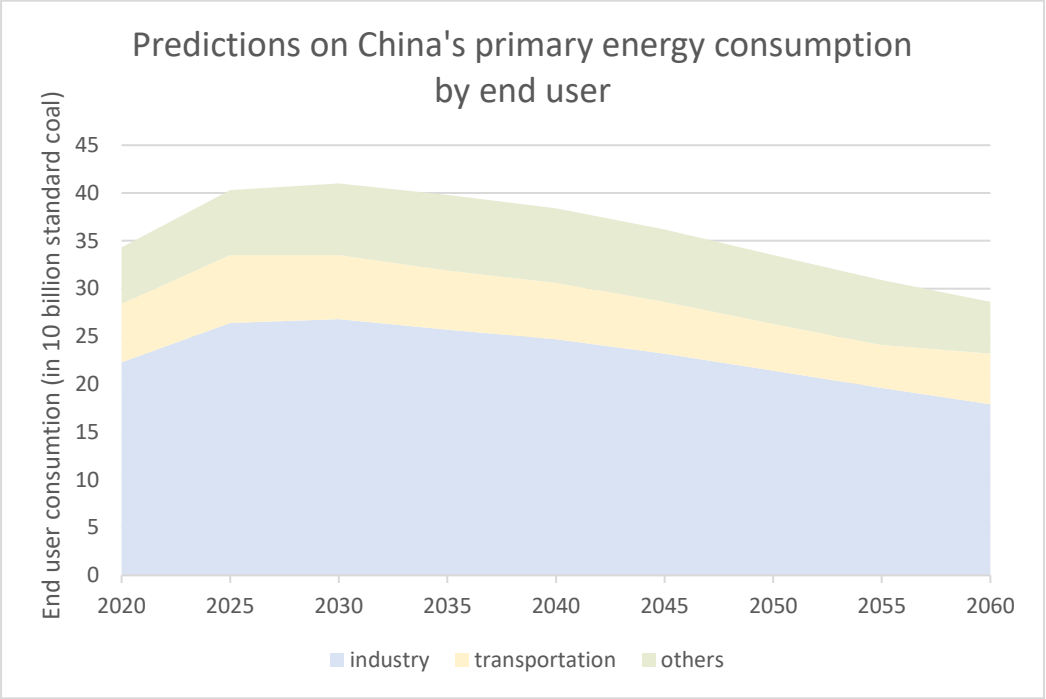
Non-fossil energy consumption was also rapidly increasing, reaching 990 million tons of standard coal equivalent in 2023. By 2045, the consumption was expected to exceed 3 billion tons, becoming the most prevalent type of energy in China. Growth will slow significantly after that, landing at 4.54

billion tons by 2060.









Source: SINOPEC

- Action: Energy Conservation & Carbon Reduction

Driven by new technologies that contributed to green development, China's energy intensity dropped by 26.1% from 2013 to 2023, making it one of the fastest countries in cutting energy intensity. This not only led to energy conservation and reduced emissions domestically, but also facilitated the global energy transition towards sustainability.

The dropping energy intensity mainly stemmed from the integration of electricity and hydrogen power (speeding up the green and low-carbon transformation of end-use energy). It was predicted that electricity would become the largest category of end-use energy at the end of the 14th Five-Year-Plan, with the electrification and hydrogenation rate of end-use energy increasing from 32% up to 37% by 2030 and to 69% by 2060.

- Outcome: Forerunner of renewable energy

China was in the leading role of green technology as well as renewable energy, and also a major exporter of the related equipment. In 2023, China contributed 60% of the electric vehicle sales, 50% of the wind & solar power installations, and 30% of nuclear energy deployments globally.

- Additional note: Concerns on energy security

When it comes to the energy security issue, China must understand that other countries' purchasing decisions were based on real security concerns rather than bias against China. Even though China's sophisticated supply

chain allowed it to produce high-quality green-energy products at competitive prices, many countries were also seeking to diversify their energy sources, by means such as boosting domestic production, to ensure their own energy security.

2.2 Key Energy Goals for 2024

In March 2024, the National Energy Administration issued the "2024 Energy Work Guiding Opinions," outlining **three key energy goals for the year (2024)**.

- Ensuring a stable energy supply

A stable energy supply was crucial for economic stability and continuous society development, which could be learnt from recent global energy scarcity events. For example, several European countries (e.g. Germany) suffered from power outages last year, leading to soaring electricity prices for business and households. As a result, many businesses faced bankruptcy, inflicting tremendous pressure on individuals and the country. To prevent from the potential treat, Chinese authorities had put out the plan that 1) National energy production to reach 4.98 billion tons of standard coal equivalent. 2) An increase in coal, crude oil and natural gas production. 3) Power generation capacity to reach approximately 3.17 billion kilowatts. On top of this, China had made notable progress in clean energy transition, with newly added wind & solar power quantity surpassing newly added traditional coal quantity for the first time, and clean technologies for fossil fuels, such as Carbon Capture, Utilization and Storage (CCUS), were already in the demonstration phase.

- Continuous improvement in the energy structure

Based on the goals set in “2024 Energy Work Guiding Opinions”, in the near future, 1) the share of electricity generation from non-fossil energy sources to reach 55%. 2) wind & solar power to contribute more than 17% of total energy generation. 3) the proportion of non-fossil energy consumption to rise to around 18.9%. 4) increasing the share of natural gas and electricity consumption in end-use applications.
However, it is worth noting that out of energy security concerns and the changing international situations, China’s energy strategy had not greatly deviated from a balanced approach of development between fossil (traditional form of reliable power supply) and non-fossil energy sources (environment-friendly power supply).

- Enhancement in the quality and efficiency of energy use

More than 10% of the industrial components, such as steel, non-ferrous metals, petrochemicals and building materials, currently fell below energy efficiency benchmarks. Over 60% of the existing equipment, including motors, boilers, and transformers, were less efficient than the advanced global standards, and more than a third of the buildings did not meet domestic energy-saving criteria.

To address this challenge, the Chinese government was promoting major technology upgrading and equipment renewal projects, to modernize the traditional industries, including industry, textiles, machinery and building material industries. Therefore, to achieve the target of transitioning towards a high-end & intelligent & green production, the traditional industries, often with a long history and a large market size, would need to grasp the business opportunities for replenishing the existing technologies and equipment.

2.3 Technology and commercial collaboration between Europe and China

China and Europe market could, to a huge extent, complement one another. Europe is now taking the lead in high-end (and environment-friendly) chemical and materials, which was imported by China in a large quantity to produce advanced materials like specialty plastics and surfactants.

On the flip side, China's electric vehicle companies are expanding into the European market. BYD, for instance, opened a new energy vehicle factory in Hungary in 2023, becoming the first Chinese EV plant in the EU. The Industry Minister of Italy is working to attract investments from Chinese carmakers like BYD, Chery and Great Wall Motors into local regions. On top of that, some other European countries adopted an alternative approach by importing solely China's EV technologies into their existing manufacturing process so that the local business would not lose much competence on the international stage.

Therefore, there is a huge potential for strategic partnership between China and Europe, in the areas of green-tech and clean energy. A recent case is the long-term agreement signed between Sinopec (China) and TotalEnergies (France), covering areas including new energy development, natural gas & LNG exploration, and the energy refining process. These two companies would also collaborate on the R&D of low-carbon technologies, such as green hydrogen, carbon capture and sustainable aviation fuel.

2.4 China energy policy impacts on machine tool business in China

- Leading domestic enterprises, particularly state-owned enterprises

1) Subsidies, loans and tax deductions were available for large-scale equipment renewal projects that met "green, efficient, and intelligent' criteria.
2) Companies that adopted "green, efficient, and intelligent' devices could not only receive monetary rewards but also gained corresponding honors.
3) Consumers could receive subsidies for trading in old items for "green and energy-saving" products. This action plan significant boosted sales of electric vehicles and energy-saving home appliances. It also further encouraged enterprises to expand their production lines for "green and energy-saving" products and purchase more relevant machine tools & equipment.

- Foreign enterprises

1）Developing more green equipment that differentiated from inefficient "Made in China" equipment.
2）Innovating more green technology and producing more green products.

3. Machine tool industry exhibitions: Recent highlights

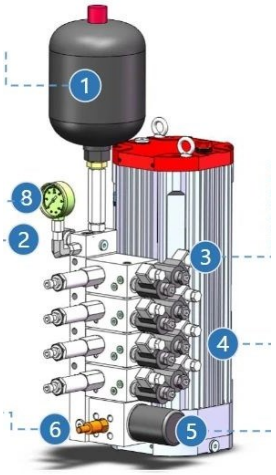
China Machine Tool Exhibition 2024 (CMES 2024, 华机展) was held in Tianjin (one birthplace of China's modern industry) during 27th to 30th August, as part of the regional strategic goal for industrial modernization, digitalization and high-quality development. Spanning 50,000 square meters in the exhibition hall, this event put a focus mainly on four industrial sectors: automobile manufacturing, precision molds, general machinery as well as shipbuilding.

Chinese media reported that over 50,000 visitors visited in the 4-day duration. Over 700 exhibitors were present in the event, mostly from China Mainland, Taiwan, Japan and Europe, displaying their cutting-edge products that entailed the core technology throughout the whole industrial chain.

New machines seen at the exhibition: a brand-new model of the gantry machine tool was showcased in CMES 2024. This model adopted a new-generation design with one-piece base and one-piece door bridge, being able to completely store the machining chips and cutting fluid in the base groove. Also, a manual 90-degree horizontal head could be attached for five-face machining to increase productivity.

With the capability of refining the die-casting parts (which usually had blurs) with high precision in the middle of the manufacturing process, this model of gantry machine tool is well-suited to the electrical vehicle industry by increasing the product power efficiency and battery life.

Traditional hydraulic station was large and high in energy consumption, often leading to a waste of resources. In the face of this issue, new energy-saving type of hydraulic stations made the debut in the exhibition event. Featured by high efficiency, small size, light weight and low temperature rise during operation, innovative hydraulic stations are equipped with aluminum alloy fuel tank (lighter in weight), control valves customized in number and an accumulator between 1.5L to 3L, which reduce the energy consumption by 80% - 90% in comparison to traditional hydraulic stations. Up until now, this product was mostly applied in machine centers.



4. Trade Exchange in the Machine Tool Industry between Italy and China (May 2024)

Italy's machine tool imports and exports with Asian region

(**In millions of Euro**)

	Import			Export		
	Value	YOY change 2023-2024	Percentage share	Value	YOY change 2023-2024	Percentage share
Asia	128.6	-42.3%	30.9%	276.8	+13.0%	17.7%
Oriental Asia	123.9	-42.1%	29.8%	121.9	-4.7%	7.8%
China	26.2	-16.7%	6.3%	90.8	-0.4%	5.8%
Worldwide total	415.8	-42.6%		1565.8	+12.1%	

Italy's machine tool imports and exports with China by category

(In millions of Euro)

Marked blue are the respective indicators for worldwide total

		Value	YOY change	Percentage share of worldwide total
Metal-cutting machine tools	Import	9.6 (291.7)	-14.6% (-38.7%)	3.3%
	Export	66.5 (683.8)	-7.1% (+10.8%)	9.7%
Metal-forming Machine tools	Import	6.5 (68.4)	-19.8% (-47.7%)	9.5%
	Export	18.8 (713.3)	+102.3% (+14.0%)	2.6%
Non-conventional technology machine tools	Imports	10.1 (55.7)	-16.5% (-52.3%)	18.2%
	Exports	5.5 (168.6)	-46.4% (+9.9%)	3.3%

Main takeaways

- According to the official data in May 2024, Italy's import of machine

tools from worldwide decreased by close to a half, similar to the import dynamics from both Asia and Oriental Asia. It's worth noting that Italy's import from China was also dropping, but on a much smaller scale (-16.7%).

- Italy's export of machine tools to Asia was increasing by a certain degree (+13%), while the export to China remained approximately unchanged.
- By category, Italy's import from China was decreasing for all kinds of machine tools. In terms of export, a downward trend could be seen for metal-cutting and non-conventional technology machine tools, but with a significant increase (+102.3%) in metal-forming machine tools.

5. Tenders and Bids in China (Sep 2024)

Announcement of Procurement Project for CNC horizontal lathe Required by China Airlines Hair Harbin Dongan Engine Co.,Ltd. **Action deadline: September 2, 2024**
Announcement of Procurement Project for Panjin Steel Pipe CNC Lathe Required by Shandong Panjin Steel Pipe Manufacturing Co., Ltd **Action deadline: September 4, 2024**
Announcement of Procurement Project for Procurement of lathe accessories, etc Required by Shandong Taishan Steel Group **Action deadline: September 6, 2024**
Announcement of Procurement Project for Procurement Tender Announcement for CNC Lathes Required by Xi'an Changqing Petroleum Tool Manufacturing Co., Ltd **Action deadline: September 9, 2024**

Announcement of Procurement Project for Public auxiliary equipment lathe welding equipment Required by Taizhou Qingfeng Magnetic Motor Co., Ltd **Action deadline: September 9, 2024**
Announcement of Procurement Project for CNC lathe accessories of Jinneng Holding Group Huayue Machinery Huayi Company Required by Jinneng Holdings Group Huayue Machinery Huayi Company **Action deadline: September 9, 2024**
Announcement of Procurement Project for Tender for Lathe Cutter of Jiangxi Luli Wood Industry Co., Ltd Required by Jiangxi Luli Wood Industry Co., Ltd **Action deadline: September 10, 2024**
Announcement of Procurement Project for CNC lathe before and after heating Required by Dongbei Special Steel Group Shandong City Eagle gear wheel Machinery Company Ltd. **Action deadline: September 12, 2024**
Announcement of Procurement Project for Tender of Cutting Tools for Lathe of Ruisheng Heavy Industry of Jincheng Steel Holding Group Required by Shanxi Jincheng Steel Holdings Group Co.Ltd. **Action deadline: September 13, 2024**
Announcement of Procurement Project for Sichuan Hongjian lathe (Second time) Required by Sichuan Hongjian Heavy Machinery Manufacturing Co., Ltd **Action deadline: September 13, 2024**
Announcement of Procurement Project for Procurement of 6140 Lathe

Required by Third Agency of China Coal No.5 Construction Company Limited **Action deadline: September 16, 2024**
Announcement of Procurement Project for Tender Announcement of CNC Lathe Required by SIDA Machinery Buiding Co. Ltd. **Action deadline: September 25, 2024**
Announcement of Procurement Project for Procurement Project of Ultra Precision Single Point Diamond Lathe by China Building Materials Academy Required by China Building Materials Academy **Action deadline: September 26, 2024**
Announcement of Procurement Project for Procurement of Ordinary Lathes for Engineering Training Center Required by Nanjing University of Science and Technology **Action deadline: September 30, 2024**