

Market Survey on

Construction Machinery and Construction
Machinery Component Sectors in China

December 2011

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CHINA CONSTRUCTION MACHINERY INDUSTRY

Market overview

- China is one of the largest manufacturing countries of building construction equipment and also offers a major market for the finished equipment. The Building Construction Equipment Manufacturing Industry in China developed strongly during the five-year current performance period to 2010.
- China's construction machinery industry revenue increased from USD 10.22 billion in 2005 to a forecast USD 45.53 billion in 2010, which represents annualized growth of 34.8%.

The main drivers of this very high industry growth were strong demand from the building construction industry, and the construction of many infrastructure projects by the Chinese government, such as the natural gas pipeline project from China's western areas to East China, and the Qinghai-Tibet railway and expressway.

- There are approximately 890 machinery manufacturers in China, mainly concentrated in concentrated in Hunan, Shandong and Jiangsu and so on.
- In general, segments requiring complicated design and manufacturing techniques are dominated by foreign brands (e.g. *hydraulic excavators, rotary drilling rigs, etc.*).
- Domestic brands are strong in segments with high demand for basic machine types, (e.g. *loaders, fork-lift trucks, etc.*).
- On a whole, while there is a significant technology gap between foreign and domestic manufacturers, these are moving up the value chain with continuous technology improvements.

Competitive landscape

Overview

- The Building Construction Equipment Manufacturing Industry in China has a low industry concentration level. This is due to the large number of small and medium enterprises operating in the industry.
- Many domestic manufactures that operate on a small scale and are privately-owned. The majority of these lack substantial capital, technologies and employees, and only produces single products and spare parts.
- Over 60% of foreign-invested manufacturers are from United States and Europe, the rest are mainly from Japan and South Korea (including also some Italian players such as *OM Fork-lift Truck*).

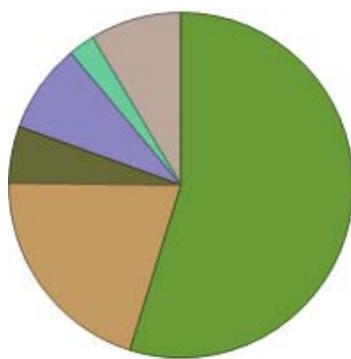


- There is still a large technology gap existing between foreign and domestic players.
- Although the market position varies by segment, some segments are dominated by domestic brands, e.g. *loaders* and *graders*.
- On the other hand, foreign brands usually dominate segments requiring more advanced design and manufacturing techniques, e.g. *hydraulic excavators* and *drilling machines*.
- However, local Chinese manufacturers are improving their technology and design manufacturing techniques, allowing them to move up the value chain.
- In particular, large domestic manufacturers are focusing on enhancing design capabilities and improving their product mix.

Geographic concentration

- In 2010 China registers 893 construction machinery manufacturers, primarily concentrated in the provinces around the Yangtze River Delta.

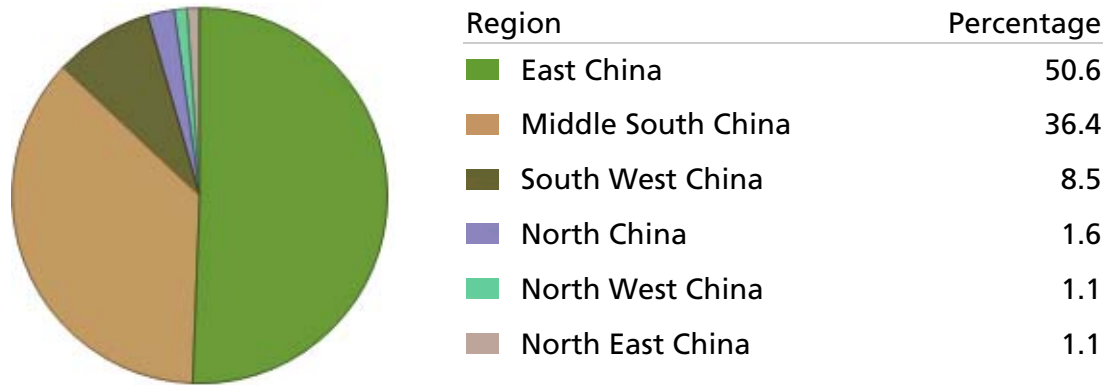
Geographic Spread of Establishments



Region	Percentage
East China	54.8
Middle South China	20.4
South West China	5.3
North China	6.5
North West China	2.5
North East China	8.6

- Key manufacturing bases include *Jiangsu Province, Shandong Province, Fujian Province, Hunan Province, Guangxi Province, Zhejiang Province, Anhui Province and Inner Mongolia Province*.

Geographic Spread of Industry Revenue



- In 2010, industry activity is concentrated in Hunan, Shandong and Jiangsu in terms of industry revenue. These two provinces are expected to make up 61.5% of industry revenue for the year.
- The industry tends to show highest efficiency in Shandong, which accounts for an estimated 17.1% of total industry employment, and about 23.4% of total industry revenue in 2010.
- Jiangsu is expected to make up 11.6% of total industry revenue, 9.5% of total industry employment and 15.3% of total industry establishment in 2010.

Key foreign players of construction machinery

- The market and growth potential in China’s construction machinery industry has been attracting many foreign players.
- Many well-known international construction machinery manufacturers have already established a presence in China, including *Caterpillar*, *Terex*, *BOMAG*, *Komatsu* etc.
- Large and medium-sized foreign players usually choose to enter the China market by establishing a manufacturing presence – either a WFOE or JV.
- Small-sized foreign manufacturers mainly import and distribute their products via agents/distributors.
- The degree of market penetration for foreign brands (including both domestically manufactured and imported) differs by segment.
- The table below shows the key foreign players with a manufacturing presence in China.

Table: Key foreign players with manufacturing presence in China

Company	Country of Origin	Year of entry	Location	Products portfolio	Description
Caterpillar	USA	1996	Beijing	<i>Excavators, compactors, diesel engines, undercarriage, iron castings, graders, tractors, loaders, manufactured products machinery components</i>	<ul style="list-style-type: none"> • Established 11 manufacturing facilities in China • In early 2008 completed acquisition of Shandong SEM Machinery Co. Ltd, a leading wheel loader manufacturer in China
Volvo Construction	Sweden	2002	Shanghai	<i>Backhoe loaders, wheel loaders, excavators, articulated haulers, motor grader, and compact equipment</i>	<ul style="list-style-type: none"> • Established a WFOE in Shanghai in 2002 • Manufacturing base in Shanghai
Terex	USA	1988	Beijing	<i>Articulated dumpers, mining trucks, backhoe loaders, front shovel hydraulic mining excavators, motor scrapers, tractor loaders</i>	<ul style="list-style-type: none"> • Established 4 JV and 3 WFOE in Inner Mongolia, Hebei, Tianjin , Jiangsu, Sichuan
BOMAG	Germany	2002	Shanghai	<i>Tampers, various kinds of plates, various kinds of rollers, multi-purpose compactors, cold milling machines, finisher, spreaders</i>	<ul style="list-style-type: none"> • Established a WFOE in Shanghai in 2002 • Manufacturing base in Shanghai

Komatsu	Japan	1995	Shanghai	<i>Compact excavators, backhoe loaders, skid steer loaders, forklift Trucks</i>	<ul style="list-style-type: none"> Established a JV with a leading domestic bulldozer manufacturer in 1995 Now has five WFOE in China
Hyundai	Korea	1995	Jiangsu	<i>Mini Excavators, Crawler Excavators, Wheel loaders, Forklifts, Skid steer Loader</i>	<ul style="list-style-type: none"> Establish a JV with Changlin Company in Jiangsu in 1995 Establish a JV with Beijing Mechatronics Industry in Beijing in '02

Key domestic players of construction machinery

- In the five years to 2010, the number of enterprises in the industry increased from 471 to a forecast 893, which is an annualized increase of 13.6%. The majority of these increases occurred between 2006 and 2008 as the industry developed rapidly and as industry revenue increased strongly. The total asset reached around USD 39.4 billion in 2010.
- The top 20 companies account for over 50% of the total domestic production value – shown in the table below.

Table: Top 20 Chinese construction machinery manufacturers

Company	Year of establishment	Location	Key Products portfolio
Xuzhou Construction Machinery Group	1989	Jiangsu	<i>Cranes, road construction machinery, road surfacing and maintaining machinery, compaction machinery, earth moving and loading machinery, special purpose vehicles</i>
Changsha Zoomlion Heavy Industry Science & Technology Development Co., Ltd	1992	Hunan	<i>Concrete machinery, cranes, environment & sanitation machinery, construction hoisting machinery, road machinery, foundation construction machinery, special vehicle</i>
Sanyi Group	1989	Hunan	<i>Concrete machinery, road construction machinery, excavating machinery, pile driving machinery, hoisting machinery, harbor machinery, coal machinery</i>
Changlin Group	1961	Jiangsu	<i>Wheel loader, motor grader, road roller, loading crane, backhoe loader, pavers, concrete mixer,</i>
Guangxi Liugong Machinery Co., Ltd	1958	Guangxi	<i>Wheel loaders, hydraulic excavators, road machinery, compact machinery, forklifts, cranes</i>
China Infrastructure Machinery Co., Ltd	1993	Shanghai	<i>Road rollers, forklifts and excavators, wheel loader</i>

<i>Xiamen XGMA Machinery Co., Ltd</i>	1951	Fujian	<i>Loader, excavator, backhoe loader, truck, roller, stone processing machinery, cables.</i>
<i>Shantui Construction Machinery Co., Ltd</i>	1980	Shandong	<i>Bulldozers, road rollers, excavators, road construction machinery, road surfacing and maintaining machinery, forklifts,</i>
<i>Hangcha Imp&Exp Co., Ltd</i>	1956	Zhejiang	<i>Diesel forklift, electric forklift, hoisting Machinery, cranes</i>
<i>Fangyuan Group</i>	1993	Shandong	<i>Concrete mixer, tower crane, concrete batching machine, concrete pump, pump-truck, concrete mixing plant, concrete mixing truck</i>

- Large Chinese conglomerates mainly serve the mid-high end market, and they are capable of competing with foreign manufacturers in some product segments (e.g. *Loaders* and *graders*) in terms of technology level.
- In contrast, there is a large gap in technology levels between foreign manufacturers and small-medium-sized Chinese manufacturers, and the latter compete intensively on price.
- Typically, there are two development trends among large Chinese manufacturers: expanding into more product segments and penetrating deeper into certain specific segments.
- Mergers and acquisitions among domestic players and cooperation with foreign players have become more prevalent.

Key market segments – construction machinery sector

This section gives snapshots of the key market segments of the construction machinery sector which includes:

1. *Cranes*
2. *Fork Lift Trucks*
3. *Loaders*
4. *Excavators*
5. *Lifts & Escalators*
6. *Bulldozers & Angledozer*s
7. *Graders & Levelers*
8. *Scrapers*
9. *Tamping Machines & Road Rollers*

10. Tunneling & Drilling Machines

11. Mixing Machines

12. Spreading Machines

Each section contains a segment overview, lists some key players, and compares technology and price levels. There may be potential opportunities for Italian players in some segments.

1. Cranes

- Example of *cranes* in the China market:



- This segment is expected to stop the decline and restart its growth over the next few years, mainly driven by increasing domestic demand.
- The majority of *crawler cranes* over 200t and *truck cranes* over 100t are imported into China, which suggests that despite the significant growth in the crane segment, there is still a large technology gap between Chinese and foreign manufacturers.
- The market of *cranes* over 100t is still dominated by foreign brands (including both locally produced and imported *cranes*).
- Key foreign manufacturers include *Liebherr, Rerex Demag, Manitowac Crane, Kobelco, Hitachi Sumitomo, etc.*
- Key domestic manufacturers include *Wushun Excavator, Sany Heavy Industry, Zoomlion, etc.*
- Driven by the fast growing market demand and high margin, many large domestic manufacturers have been making efforts to enhance design and production capabilities.
- For example, *Zoomlion* successfully produced the first domestic 600t *crawler crane*, suggesting domestic manufacturers are going to compete in the high-end sector in the near future.
- The average price of domestic brands is anywhere between 30% to 80% lower than foreign brands, depending on the type of crane.

2. Fork-lift trucks

- Example of *fork-lift trucks* in the China market



- China mainly imports electronic motor and large-scaled *fork-lift trucks*, while exporting internal combustion engine *fork-lift trucks*.
- High-mid sectors (about 35% of the *fork-lift truck* segment size) are currently dominated by foreign brands (including both locally produced and imported).
- Key foreign manufacturers include *Linde Fork-lift Truck Corp.*, *Doosan Infracore Corp.*, *Hyundai Construction Equipment*, etc.
- Key domestic manufacturers include *Anhui Heli Fork-lift*, *Hangzhou Forklift*, *Dalian Forklift*, etc.
- About 80% of the domestic demand comes from *internal combustion fork-lift trucks*, while *electronic motor fork-lift trucks* are more prevalent in developed countries.
- Overall the low technology level of the core components (e.g. engine, hydraulic parts) hinders the development of China's *fork-lift truck* industry.
- Regarding price level, the average prices of domestic brands are about 30-60% lower than foreign brands, depending on the type of machine.
- However, competition is intensifying in the low-mid sectors as many foreign *fork-lift truck* brands began entering these sectors.

3. Loaders

- Example of *loaders* in the China market



- China is the No.1 loader manufacturing country in the world.
- This segment experienced significant growth since 2000, and currently domestic *loaders* account for over 90% of the total market in China.
- This segment is expected to continue its fast paced growth over the next few years, mainly driven by domestic infrastructure construction and export demand.
- Imported products are mainly large-scale *loaders*.
- Key foreign manufacturers include *Caterpillar, Volvo, Kamatsu, etc.*
- Key domestic manufacturers include *Xiamen Machinery, China Infrastructure Machinery, Xuzhou Machinery, Changlin Company, etc.*
- Product reliability is still the major technology problem of domestic brands compared with foreign brands.
- The average prices of domestic brands are about 20-80% lower than foreign brands, varying by type of machine.
- Recently, intensifying competition among domestic manufacturers is squeezing the overall profit; thus, many domestic players have been moving from competing on price to competing on after-sale services.

4. Excavators

- Example of *excavators* in the China market



- This segment is expected to keep fast growth in next few years, mainly driven by domestic infrastructure construction; the small sized (6-10t) *excavators* sector is growing fastest.
- China mainly imports crawler excavators, which accounts for about 98% of the total excavator imports.
- Regarding domestic market, foreign brands (including locally produced and imported) dominate the market, especially in the $\geq 13\text{t}$ excavator sector.
- Key foreign manufacturers include *Daewoo, Hyundai, Komatsu, Hitachi, Sumitomo, etc.*
- During the last decade, many foreign excavator manufacturers have entered Chinese excavator market via Joint Venture and have established manufacturing facilities in China.
- Key domestic manufacturers include *Sany Heavy Industry, Liuzhou Machinery, Xuzhou Machinery, Shangdong Lingong Excavator, etc.*
- Excavators are typically high-valued added construction machinery equipment, which have a high technology requirement terms of core components (e.g. hydraulic parts and transmission parts); currently domestic brands still mainly rely on imported core components to manufacture excavators
- The average prices of domestic brands are about 20-80% lower than the foreign brands, differing by machine type.

5. Lifts and escalator¹

- Example of *lifts* and *escalators* in the China market



- China is one of the leading *lifts* and *escalators* manufacturing countries in the world in terms of production volume.
- Small-sized *lifts* and *escalators* are expected to grow fastest, mainly driven by the increasing number of construction projects undertaken by the government in many rural areas.
- Small-sized *lifts* and *escalators* (own weight $\leq 1t$) are the most common types in the China market, accounting for about 40% of the total *lifts* and escalator segment, and dominated by domestic brands.
- However, the overall technology level of domestic manufacturers is still low.
- Key foreign manufacturers include *Terex, Liebherr, Dematic, etc.*
- Key domestic manufacturers include *DMT Hydraulic Machinery, etc.*
- The average prices of domestic brands are about 20-50% lower than the foreign brands (including locally produced and imported), differing by type of machine.

¹ Lifts and escalators in this report only refer to industrial lifts and escalators; passenger lifts and escalators are excluded

6. *Bulldozers and angledozers*

- Example of *bulldozers* and *angledozers* in the China market



- Total domestic demand is expected to maintain stable growth, however, the small-sized *bulldozers* and *angledozers* sectors (≤ 100 hp) will experience fast.
- This segment is highly concentrated, with the top 5 domestic manufacturers controlling 90% of the market share.
- Domestic brands dominate all sectors, including the high-end sector.
- Key foreign manufacturers include *Caterpillar*, *Komatsu*, *Liebherr*, etc.
- Key domestic manufacturers include *Shantui Construction Machinery*, *Xuanhua Construction Machinery*, *Tianjin Yishan Construction Machinery*, *YTO Group*, etc.
- The technology gap mainly lies in hydraulic and large-sized machines.
- The average prices of domestic brands are about 30-50% lower than the foreign brands (including locally produced and imported), differing by type of machine.

7. Graders and levelers

- Example of *graders* and *levelers* in the China market



- Driven by the massive investment the Chinese government is putting into road system construction (especially in the rural area), this segment is expected to grow fast in the next few years.
- Domestic brands dominate low to mid-end sectors.
- Key foreign manufacturers include *Wirtgen, Nikko, Ingersoll Rand, Dynapac, BOMAG, etc.*
- Key domestic manufacturers include *Zoomlion, Sany Heavy Industry, Nanfang Road Machinery, Xuzhou Machinery, etc.*
- Overall quality and reliability of domestic brands are still much lower than foreign brands; for example, domestic standards for mean time between failures (MTBF) is ≥ 150 h, while foreign brands are maintaining developed countries' standards of $MTBF > 500$ h.
- The average prices of domestic brands are about 30-75% lower than foreign brands (including locally produced and imported), differing by type of machine.

8. Scrapers

- Example of *scrapers* in the China market



- This segment is expected to experience growth in next few years, especially *scrapers* with greater power and volume metric size.
- Currently, domestic brands dominate low to mid-end sectors.
- Diesel scraper and multi-functional scraper are the most common types in the China market.
- Key foreign manufacturers include *Caterpillar, Ingersoll Rand, Dynapac, etc.*
- Key domestic manufacturers include *Yutong Group, Xuzhou Machinery, Xiamen Machinery, Liuzhou Machinery, etc.*
- Currently, the three core components – engine, gearbox and axle - are still mainly imported.
- The average prices of domestic brands are about 30-60% lower than the foreign brands (including locally produced and imported), differing by type of machine.

9. Tamping machine and road rollers

- Example of *tamping machine* and *road rollers* in the China market



- This segment is expected to maintain stable growth in next few years, mainly driven by increased investment on infrastructure.
- Currently, domestic brands dominate low to mid-end sectors.
- In contrast, foreign brands are widely used in national-class key construction projects and high-way projects.
- Key foreign manufacturers include *Ingersoll Rand*, *Dynapac*, *BOMAG*, *Sakai*, etc.
- Key domestic manufacturers include *Xuzhou Machinery*, *YTO*, *Zoomlion*, etc.
- 18t static roller and mechanical vibratory rollers are the most common type in the China market.
- Large-scaled (\geq t) rollers and hydraulic-controlled vibratory rollers are mainly imported.
- The average prices of domestic brands are about 20-80% lower than foreign brands (including locally produced and imported), differing by type of machine.

10. Tunneling and drilling machinery²

- Example of *rotary drilling rigs* in the China market



- Currently foreign brands (including locally produced and imported) account for about 60% of the total market.
- Domestic brands focus on machines with a drilling head slewing torque of 200KNm; products of other torque range are mainly imported.
- Key foreign manufacturers include *Soilmec, IMT, Mait, Bauer, etc.*
- Key domestic manufacturers include *Sanyi, Xuzhou Machinery, Yutong Group, Zoomlion, etc.*
- There are two major technology barriers for domestic manufacturers are hydraulic component and drill pipe.
- However, domestic manufacturers are starting to enter the large-scaled *rotary drilling rig* sector; for example, *Sany Group* is able to produce hydraulic rotary *drilling rigs* with a slewing torque of 360KNm.
- The average prices of domestic brands are about 30-80% lower than the foreign brands, differing by type of machine.

² Tunneling and drilling machinery covers many small sub-segments with low volume. In this section, we focus on a major type – rotary drilling rig, which has great potential in China market

11. Mixing machines³

- Example of *mixing machines* in the China market

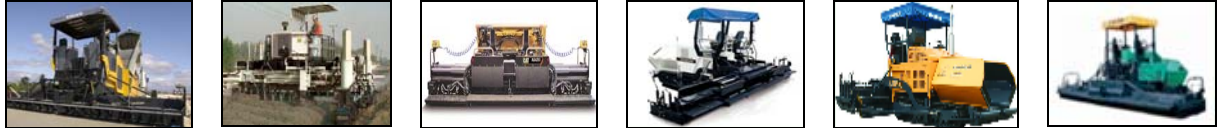


- Overall, this segment is expected to have stable growth over the next few years.
- However, it is expected to experience faster growth in Western China.
- Imported products are mainly large-scaled mixers.
- Domestic brands dominate the market; however, the majority is low to mid-end products.
- Due to intensifying competition in the domestic market and price advantage in the global market, many domestic manufacturers are becoming export-oriented.
- Key foreign manufacturers include *Liebherr, Vogeles, etc.*
- Key domestic manufacturers include *Zoomlion, Liuzhou Machinery, Fangyuan Group, etc.*
- The average prices of domestic brands are about 40-80% lower than the foreign brands, differing by type of machine.

³ Mixing machines cover several sub-segments. In this section, we focus on a major type – concrete or mortar mixer, which has great potential in China market

12. Spreading machines⁴

- Example of *spreading machines* in the China market



- Although domestic production has decreased during from 2006 through 2008, the overall market segment is expected to increase in next few years, driven by domestic infrastructure construction.
- Foreign brands (including locally produced and imported) account for about 14% of the total market.
- Recently, intensifying competition among domestic manufacturers is squeezing the overall profit margins; thus, many domestic players have been moving from competing on price to competing on after-sale services.
- Key foreign manufacturers include *Ingersoll Rand, Dynapac, VogeLe, etc.*
- Key domestic manufacturers include *Shangxi Construction, Xuzhou Machinery, Xi'an Road Construction, Zoomlion, etc.*
- Domestic brands are able to compete with foreign brands; however, the majority of core parts (e.g. hydraulic parts, electronic parts and transmission gearboxes) for high-end products are imported.
- The average prices of domestic brands are about 10-30% lower than the foreign brands, differing by type of machine.

⁴ Spreading machines cover several sub-segments. In this section, we focus on a major type –bituminous concrete spreaders, which is the largest sub-segment in China market

Snapshot of China second-hand construction machinery market

This section gives an overview of China's second-hand construction machinery market, which is experiencing rapid growth. There may be potential opportunities for Italian players to export second-hand construction machinery to China.

Market overview

- China's second-hand construction machinery market has grown rapidly over the last decade, driven by the rising threshold of import volume and growing infrastructure in many Chinese cities.
- In 2010, sales of second-hand equipment through third-parties are estimated to make up 12.1% of industry sales during the year. Some customers purchase second-hand equipment due to the lower price and beneficial depreciation levels.
- Many domestic construction machinery players are beginning to operate the business of second-hand machinery via direct sales or using agents.
- Continued demand will be in line with the development in China's rural areas.
- Local governments in rural areas prefer to use second-hand construction machines rather than the new ones as second-hand machines offer higher price-quality ratio⁵.
- In addition, many construction contractors also prefer second-hand construction machines with foreign or large domestic brands than new machines with small or no brand name.
- However, the second-hand construction machinery market is not without issues.
- There are no standards to evaluate the productivity and safety of second-hand machines (both imported and locally produced) before being sold to the end-customer, as there are with new machines.
- As a result, customers are risking in buying second-hand machine as it may be of poor quality and offer poor after-sales services.
- The government is in the process of developing a technology standard to regulate the second-hand construction machinery market, and enforce a higher quality threshold to limit the entry of low quality imported second-hand machines.

Competitive landscape

- The second-hand construction machinery market is concentrated along the east coast of China, mainly in port cities such as *Shanghai, Tianjin, Guangzhou, Shenzhen, Nanjing*, and *Shandong, Zhejiang* province.

⁵ Price of second-hand construction machines is normally 40 – 60% of that of new machines, depending on the types of machines and the machines' productivity and lifespan (e.g. how many hours already operated)



- *Shanghai, Tianjin, and Guangdong Provinces* together account for nearly 20% of the market.
- The following table shows the key types of second-hand construction machinery and the key brands (foreign and domestic) selling in the Chinese market.

Table: Key types of second-hand construction machinery and brands

Key types	Key brands in the second-hand market*
Second-hand Excavators	<i>Caterpillar, Komatsu, Kato, Hitachi, Sumitomo, Kobelco, Hyundai, Doosan</i>
Second-hand cranes	<i>Xuzhou Construction Machinery, Sichuan Changjiang, Hunan Puyan, Kato, Tadano</i>
Second-hand loaders	<i>Xiamen Machinery, Xuzhou Construction Machinery, Guangxi Liugong, Jiangxi Yigong, Shanghai Longgong</i>
Second-hand road rollers	<i>Yto (Luoyang), Xuzhou Construction Machinery, Xiamen XGMA Machinery, Guangxi Liugong</i>
Second-hand bulldozers	<i>Yto (Luoyang), Kawasaki Construction Machinery, Caterpillar</i>
Second-hand fork-lift trucks	<i>Zhejiang Hangcha, Anhui Heli, Suzhou Heping</i>

*Note: these are not exclusive brands. Source: JLJ analysis based on multiple sources including companies websites

Second hand excavator market is dominated by foreign brands (Japanese, US, South Korean brands)

- Among which, 80 – 90% of imported second-hand *excavators* came from Japan.
- On the other hand, domestic brands dominate other types of second-hand construction machinery, such as *cranes, loaders, road rollers, bulldozers, and fork-lift*.

Key customer segments – Construction machinery industry

The following section gives a snapshot of the current situation of several key customer segments for the construction machinery industry, which will heavily influence the construction machinery market in the near future.

1. *Transportation infrastructure*
2. *Real estate construction*
3. *Heavy manufacturing industries*
4. *Other key segments*

1. *Transportation infrastructure*

- China's transportation infrastructure has improved significantly over the last twenty five years, due to considerable government investment; as a key customer, the Chinese government has contributed significantly to the fast growth of the construction machinery industry.
- Another recent example of the governments continued support is demonstrated in the recently passed stimulus plan that includes measures for massive investment in the transportation system.

a) **Railway construction**

- In the "Eleventh Five-year Plan" (2006 – 2010), China will invest RMB 1.25 trillion to build 17,000 km new railway.
- In 2010, China began to construct high-speed railways and additional public housing on a large scale, which creates great demand for building construction equipment.
- Many segments of construction machinery will benefit from the increasing demand from railway construction, e.g. *tunneling and drilling machines, excavators, loaders, etc.*

b) **Road and highway construction**

- RMB 140 billion in national funds was approved by the central government for village and local road development during the "Eleventh Five-year Plan".
- The major road plan "*National Expressway Network*", also called the "*7-9-18 Highway Network*" is scheduled to be completed by 2020.
- The plan aims to reach more than 1 billion people via a total 85,000 km of high-grade expressways, comprising 7 capital radials, 9 north-south highways,

and 18 east-west corridors.

- Thus, there is good market potential for construction machinery, especially for small-sized machinery which will be widely used in construction of roads in rural area⁶.

c) Other types of transportation infrastructure construction

- Airports – about 40 new airport construction and upgrade projects are underway, which will increase the number of airports to 190 by 2010, with plans to reach 220 airports by 2020.
- Urban rail traffic (subways/light rail) – 11 cities plan to build rail traffic lines before 2010.

2. Real estate construction

- With the development of the real estate market in recent years and the promotion of major events such as the Asian Games, Olympic Games and Shanghai Expo, this industry in Guangdong, Beijing and Shanghai has also developed rapidly in recent year.

3. Heavy manufacturing industry

- Metallurgy – in next few years, about 10 leading domestic iron & steel companies will invest in new construction projects and upgrades.
- Petrochemical – in the next ten years, China plans to complete construction of 30 million-ton ethane production projects and 30 10-million-ton refinery projects.

4. Other key segments

- Electricity network – about RMB 450 billion will be invested in the construction of nuclear electricity plants by 2010; hydro power stations will also maintain fast growth through 2015.
- The South-North Water Transfer Project⁷ – the first stage of eastern and middle-route of the water transfer project started from 2002 and will complete by 2014; the total investment reached RMB 250 billion.

⁶ Roads in rural areas are graded lower than those in urban areas, thus in many segments (e.g. excavator, mixing machinery and grader) small-sized construction machinery can meet the technology requirement

⁷ The South-North Water Transfer Project is a multi decade project being undertaken by China's government for the purpose of diverting water from Southern China to Northern China, where there is a severe water shortage problem

Import and export analysis

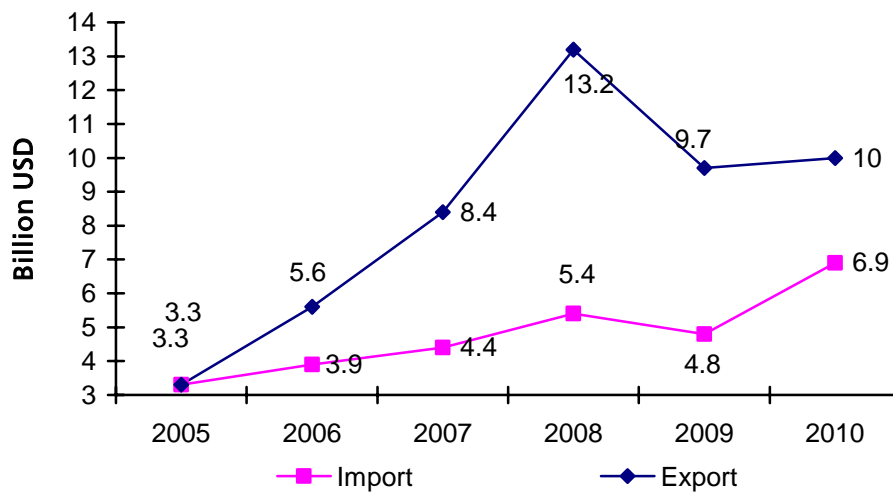
This section analyzes imports and exports of China’s construction machinery industry, with focus on Italy’s position; it includes only and all types of machinery used in the construction industry.

The import export analysis for construction machinery is based on a list of selected HS codes used to define the industry; please refer to appendix A.2.

Overview

- In 2010, China’s exports of construction machinery reached USD 10 billion, representing an increase of 4.2% over 2009.
- On the other hand, total imports in 2010 were USD 6.9 billion, a 43.2% increase from 2009.
- The following chart shows the overall exports and imports from 2005 to 2010.

China Import & Export of Construction Machinery 2005 - 2010



Source: China Customs

Imports of construction machinery

- China total imports of construction machinery has experience the increase in 2010.
- The following table shows the top countries China imported construction machinery equipment from between 2008 – 2010.

Table: China's construction machinery import by country 2008 – 2010

Rank	Country	January - December			% Share			%Change	
		2008	2009	2010	2008	2009	2010	- 10/09	-
0	-- World --	5444.13	4820.10	6904.30	100	100	100	43.24	
1	Japan	2214.97	1832.03	3064.76	40.69	38.01	44.39	67.29	
2	Germany	715.56	848.00	959.46	13.14	17.59	13.9	13.14	
3	Korea, South	417.31	381.19	859.71	7.67	7.91	12.45	125.53	
4	United States	593.68	380.99	396.15	10.91	7.9	5.74	3.98	
5	Norway	140.90	191.58	183.83	2.59	3.98	2.66	-4.05	
6	Italy	124.59	187.67	171.70	2.29	3.89	2.49	-8.51	
7	Australia	66.69	83.24	157.98	1.23	1.73	2.29	89.78	
8	Taiwan	194.40	72.68	156.90	3.57	1.51	2.27	115.86	
9	United Kingdom	83.41	55.16	154.28	1.53	1.14	2.24	179.69	
10	Sweden	148.23	135.86	151.65	2.72	2.82	2.2	11.62	

Source: China Customs

- In 2009, Italy ranked No. 6, accounting for 2.49% of the total imports (or USD 171.7million). It has a -8.15% decrease compare to 2009.
- China mainly imports medium to high-end construction machinery.

Table: China's construction machinery import by country 2009-2011

Rank	Country	January - October			% Share			%Change	
		2009	2010	2011	2009	2010	2011	- 11/10	-
0	-- World --	3883.66	5608.45	6526.81	100	100	100	16.37	
1	Japan	1385.66	2453.43	2440.55	35.68	43.75	37.39	-0.53	
2	Germany	704.51	744.37	1180.67	18.14	13.27	18.09	58.61	
3	Korea, South	314.67	715.34	1124.58	8.1	12.76	17.23	57.21	
4	United States	333.19	340.79	436.83	8.58	6.08	6.69	28.18	
5	Taiwan	58.20	116.38	200.09	1.5	2.08	3.07	71.93	
6	Italy	131.69	145.22	128.05	3.39	2.59	1.96	-11.82	
7	Sweden	115.41	120.66	125.10	2.97	2.15	1.92	3.68	
8	Austria	102.11	107.28	113.35	2.63	1.91	1.74	5.66	
9	United Kingdom	44.78	127.44	95.49	1.15	2.27	1.46	-25.07	
10	France	61.08	96.35	86.64	1.57	1.72	1.33	-10.08	

Source: China Customs

- Italy still ranked No. 6 accounting for 1.96% of the total imports (or USD 128 million) in the first ten months of 2011.
- It has a decrease -11.82% compare to the same period of last year.

Table: China's construction machinery import by HS code 2008-2010

HS	Description	January - December			% Share			%Change
		2008	2009	2010	2008	2009	2010	- 10/09 -
	-- World --	5444.13	4820.10	6904.30	100	100	100	43.24
842952	<i>Shovels And Excavators With A 360 Revolving Supers</i>	1763.96	1516.93	3186.80	32.4	31.47	46.16	110.08
8428	Lifting, Handling, Loading Or Unloading Machinery,	1531.27	1369.19	1743.60	28.13	28.41	25.25	27.35
8430	Moving/Grading/Scraping Or Boring Machinery For Earth;	749.15	695.89	661.80	13.76	14.44	9.59	-4.9
8426	Derricks; Cranes; Straddle Carriers, And Works	677.49	598.72	548.61	12.44	12.42	7.95	-8.37
8427	Fork-Lift Trucks; Other Works Trucks Fitted With L	344.93	291.48	387.49	6.34	6.05	5.61	32.94
84791021	Machines For Spreading Bituminous Concrete	34.78	38.92	79.90	0.64	0.81	1.16	105.28
842951	Front End Shovel Loaders	66.73	55.08	72.73	1.23	1.14	1.05	32.05
847439	Mixing Or Kneading Machines For Earth Or Other	92.94	69.74	69.24	1.71	1.45	1	-0.72
842911	Bulldozers And Angle dozers, Crawler Type	64.47	80.06	64.34	1.18	1.66	0.93	-19.63
842930	Scrapers, Self-Propelled	44.86	34.17	26.60	0.82	0.71	0.39	-22.16
842940	Tamping Machines And Road Rollers, Self- Propelled	26.71	15.98	17.53	0.49	0.33	0.25	9.72
842959	Self-Propelled Excavating Machinery	6.42	0.95	12.60	0.12	0.02	0.18	1231.02
842920	Graders And Levelers, Self-Propelled	8.21	10.05	10.21	0.15	0.21	0.15	1.56
847431	Concrete Or Mortar Mixers	13.94	7.46	9.91	0.26	0.16	0.14	32.7
847432	Machines For Mixing Mineral Substances With Bitumen	10.32	19.64	5.61	0.19	0.41	0.08	-71.42
842919	Bulldozers And Angle dozers, Wheeled	7.57	15.45	4.23	0.14	0.32	0.06	-72.61
84791022	Stabilizer Spreading Machines	0.00	0.00	1.73	0	0	0.03	0
84791029	Other Spreading Machines	0.37	0.38	1.38	0.01	0.01	0.02	258.91

Source: China Customs

- The product category "HS 842952 - Shovels and Excavators with a 360 Revolving Supers" accounting for 46.16% of the total import from the world, (3186.80 millions of USD) and the obvious increase 110.08% compare to 2009.

Table: China's construction machinery import by HS code 2009-2011

HS	Description	January - October			% Share			%Change
		2009	2010	2011	2009	2010	2011	- 11/10 -
	-- World --	3883.66	5608.45	6526.81	100	100	100	16.37
842952	<i>Shovels And Excavators With A 360 Revolving Supers</i>	1136.91	2570.30	2668.35	29.27	45.83	40.88	3.81
8428	Lifting, Handling, Loading Or Unloading Machinery,	1098.02	1396.79	2004.03	28.27	24.91	30.71	43.47
8430	Moving/Grading/Scraping Or Boring Mchy For Earth;	597.94	554.16	570.10	15.4	9.88	8.74	2.88
8426	Derricks; Cranes; Straddle Carriers, And Works Tru	538.39	466.54	565.44	13.86	8.32	8.66	21.2
8427	Fork-Lift Trucks; Other Works Trucks Fitted With L	226.79	316.14	293.21	5.84	5.64	4.49	-7.26
847439	Mixing Or Kneading Machines Nes For Earth Or Other	59.64	54.91	94.27	1.54	0.98	1.44	71.69
84791021	Machines For Spreading Bituminous Concrete	30.66	64.40	90.71	0.79	1.15	1.39	40.85
842911	Bulldozers And Angledozer, Crawler Type	62.63	43.24	64.84	1.61	0.77	0.99	49.97
842930	Scrapers, Self-Propelled	25.04	21.40	42.85	0.65	0.38	0.66	100.2
842951	Front End Shovel Loaders	46.89	66.41	38.20	1.21	1.18	0.59	-42.48
842940	Tamping Machines And Road Rollers, Self-Propelled	13.50	14.35	22.57	0.35	0.26	0.35	57.25
847431	Concrete Or Mortar Mixers	6.89	8.95	15.75	0.18	0.16	0.24	75.93
842920	Graders And Levellers, Self-Propelled	9.41	9.76	15.31	0.24	0.17	0.24	56.85
847432	Machines For Mixing Mineral Substances With Bitume	19.49	4.15	14.88	0.5	0.07	0.23	258.38
842959	Self-Propelled Excavating Machinery Nes	0.83	10.44	13.70	0.02	0.19	0.21	31.24
842919	Bulldozers And Angledozer, Wheeled	10.25	3.38	12.05	0.26	0.06	0.19	256.28
84791029	Other Spreading Machines, Nes	0.38	1.38	0.53	0.01	0.03	0.01	-61.61
84791022	Stabilizer Spreading Machines	0.00	1.73	0.00	0	0.03	0	-99.94

Source: China Customs

- The product category "HS 842952 - Shovels and Excavators with a 360 Revolving Supers" accounting for 40.88% of the total import from the world in the first ten months of 2010, (2668.35 millions of USD) and the increase 3.81% compare to the same period in 2010.

Table: China's construction machinery import from Italy by HS code 2008-2010

HS	Description	January - December			% Share			%Change
		2008	2009	2010	2008	2009	2010	- 10/09 -
	Italy	124.59	187.67	171.70	2.29	3.89	2.49	-8.51
8428	Lifting, Handling, Loading Or Unloading Machinery,	80.15	146.14	121.25	64.33	77.87	70.61	-17.04
8430	Moving/Grading/Scraping Or Boring Machinery For Earth;	4.99	9.16	19.58	4.01	4.88	11.41	113.85
8426	Derricks; Cranes; Straddle Carriers, And Works	10.40	12.49	15.31	8.35	6.65	8.91	22.59
8427	Fork-Lift Trucks; Other Works Trucks Fitted With L	23.73	11.23	11.37	19.04	5.98	6.62	1.24
847439	Mixing Or Kneading Machines For Earth Or Other	1.39	3.08	1.55	1.11	1.64	0.9	-49.58
847432	Machines For Mixing Mineral Substances With Bitumen	0.68	2.47	1.08	0.55	1.32	0.63	-56.29
84791021	Machines For Spreading Bituminous Concrete	0.00	1.33	1.05	0	0.71	0.61	-21.01
847431	Concrete Or Mortar Mixers	2.73	1.31	0.32	2.19	0.7	0.19	-75.58
842952	Shovels And Excavators With A 360 Revolving Supers	0.00	0.24	0.20	0	0.13	0.12	-17.7
842959	Self-Propelled Excavating Machinery	0.00	0.11	0.00	0	0.06	0	-100
84791022	Stabilizer Spreading Machines	0.00	0.00	0.00	0	0	0	0
84791029	Other Spreading Machines	0.00	0.00	0.00	0	0	0	0
842911	Bulldozers And Angle dozers, Crawler Type	0.00	0.00	0.00	0	0	0	0
842920	Graders And Levelers, Self-Propelled	0.45	0.01	0.00	0.36	0.01	0	-100
842930	Scrapers, Self-Propelled	0.00	0.00	0.00	0	0	0	0
842940	Tamping Machines And Road Rollers, Self-Propelled	0.00	0.00	0.00	0	0	0	0
842951	Front End Shovel Loaders	0.07	0.10	0.00	0.06	0.06	0	-100

Source: China Customs

The product category "HS -8428 Lifting, Handling, Loading or Unloading Machinery" has the biggest percentage 70.61% among all the construction machinery in 2010. China imported 121.25 millions of USD from Italy, but it has a -17.04% decrease compare to 2009.

Table: China's construction machinery import from Italy by HS code 2009-2011

HS	Description	January - October			% Share			%Change
		2009	2010	2011	2009	2010	2011	- 11/10 -
	Italy	131.69	145.22	128.05	3.39	2.59	1.96	-11.82
8428	Lifting, Handling, Loading Or Unloading Machinery,	98.11	105.32	85.81	74.5	72.52	67.02	-18.52
8430	Moving/Grading/Scraping Or Boring Machinery For Earth;	6.17	12.49	20.06	4.69	8.6	15.67	60.66
8427	Fork-Lift Trucks; Other Works Trucks Fitted With L	10.92	9.92	11.14	8.29	6.83	8.7	12.34
8426	Derricks; Cranes; Straddle Carriers, And Works	8.03	13.76	8.35	6.1	9.47	6.52	-39.26
847439	Mixing Or Kneading Machines For Earth Or Other	3.00	1.42	1.43	2.28	0.98	1.12	1.06
847431	Concrete Or Mortar Mixers	1.31	0.25	0.53	0.99	0.17	0.41	112.76
84791021	Machines For Spreading Bituminous Concrete	1.33	0.80	0.48	1.01	0.55	0.38	-39.39
842952	Shovels And Excavators With A 360 Revolving Supers	0.24	0.20	0.11	0.18	0.14	0.09	-43.24
84791029	Other Spreading Machines	0.00	0.00	0.09	0	0	0.07	0
847432	Machines For Mixing Mineral Substances With Bitumen	2.47	1.08	0.02	1.87	0.74	0.02	-98.24
842920	Graders And Levelers, Self-Propelled	0.01	0.00	0.02	0.01	0	0.01	0
842911	Bulldozers And Angle dozers, Crawler Type	0.00	0.00	0.00	0	0	0	0
842930	Scrapers, Self-Propelled	0.00	0.00	0.00	0	0	0	0
842940	Tamping Machines And Road Rollers, Self-Propelled	0.00	0.00	0.00	0	0	0	0
842951	Front End Shovel Loaders	0.10	0.00	0.00	0.08	0	0	0
842959	Self-Propelled Excavating Machinery	0.00	0.00	0.00	0	0	0	0
84791022	Stabilizer Spreading Machines	0.00	0.00	0.00	0	0	0	0

Source: China Customs

The product category "HS -8428 Lifting, Handling, Loading or Unloading Machinery" has the biggest percentage 70.61% among all the construction machinery in 2010. China imported 121.25 millions of USD from Italy, but it has a -17.04% decrease compare to 2009.

Exports of construction machinery

- In 2010, China's exports of construction machinery reached USD 10 billion (4.22% increase from 2009), with majority being low to medium-end products.

China Export to the World by country 2008 – 2010

Rank	Country	January - December			% Share			%Change
		2008	2009	2010	2008	2009	2010	- 10/09 -
0	-- World --	13239.32	9683.20	10092.16	100	100	100	4.22
1	India	715.02	564.78	678.56	5.4	5.83	6.72	20.15
2	United States	642.04	306.32	545.56	4.85	3.16	5.41	78.1
3	Russia	1131.72	381.81	507.51	8.55	3.94	5.03	32.92
4	Brazil	250.52	304.71	427.18	1.89	3.15	4.23	40.19
5	Indonesia	364.15	194.34	382.31	2.75	2.01	3.79	96.73
6	Vietnam	309.04	337.41	350.64	2.33	3.48	3.47	3.92
7	Singapore	477.39	334.72	274.28	3.61	3.46	2.72	-18.06
8	Iran	290.93	390.79	271.88	2.2	4.04	2.69	-30.43
9	Kazakhstan	273.55	196.92	258.32	2.07	2.03	2.56	31.18
51	Italy	110.35	47.25	49.74	0.83	0.49	0.49	5.28

Source: China Customs

China Export to the World by country 2009-2011

Rank	Country	January - October			% Share			%Change
		2009	2010	2011	2009	2010	2011	- 11/10 -
0	-- World --	8030.36	8294.28	11319.37	100	100	100	36.47
1	Russia	337.02	406.44	738.78	4.2	4.9	6.53	81.77
2	India	472.23	550.11	661.74	5.88	6.63	5.85	20.29
3	Brazil	264.39	350.36	660.17	3.29	4.22	5.83	88.43
4	United States	262.94	406.84	529.32	3.27	4.91	4.68	30.11
5	Indonesia	167.12	315.87	436.60	2.08	3.81	3.86	38.22
6	Iran	316.09	229.99	365.17	3.94	2.77	3.23	58.78
7	Vietnam	281.08	255.19	342.19	3.5	3.08	3.02	34.09
8	Korea, South	509.73	168.45	329.69	6.35	2.03	2.91	95.73
9	Singapore	209.36	242.27	320.26	2.61	2.92	2.83	32.19
49	Italy	39.42	40.51	51.85	0.49	0.49	0.46	27.99

Source: China Customs

- In the first ten months of 2011, Italy ranked from 51st to 49th position as the demand countries to China. China total export to the world 11 million of USD in the first ten months of 2011.
- China's construction machinery is exported to over 200 countries and regions; the major export destinations are Asian countries (about 40% of total) and South America, Europe and Middle East.
- Exports are expected to stop the decline as domestic manufacturers are making technology improvement and continue to have a price advantage.



- During the past few years, exports of construction machinery have grown faster than that of construction machinery components, mainly due to higher profit margins in the machinery sector.

Key trends and market dynamics – construction machinery sector

- ***Domestic manufacturers moving up the value chain***
 - Large domestic manufacturers are moving away from competing purely on price and moving to compete more on value-added products.
 - Large domestic manufacturers are making efforts to improve design and manufacturing capabilities, technology levels, etc; resulting in more R&D investment.
 - The government supports upgrading the industry and improving technology.
- ***Trend toward merger and acquisition among large players***
 - Since 2003, there has been a horizontal integration trend inside the industry among large domestic and international players.
 - Large domestic players usually target medium-sized companies for acquisition and expect to supplement their product mix and expand production capacity.
 - Foreign players can leverage the business channels of domestic companies and gain faster time to market via M&A.
 - Recently, large domestic players are also seeking possibilities of M&A with foreign companies in order to gain access to new markets and increase technology levels.
- ***Diversification of distribution channels***
 - Direct sales and sales via agents are still the major distribution channels for construction machinery.
 - However, with increasing demand there has been a diversification of distribution channels and an emergence of more distribution channels, such as financial leasing and financing options for purchases.
 - Online sales and 4S stores also appear with the purpose of offering more convenient and better services.

- ***Potential opportunities in some segments***
 - The small-sized construction machinery segment is expected to grow fast, mainly driven by the demand in rural areas which has recently become the focus of China's high-level infrastructure construction plan.
 - Moreover, research to improve technology levels of high-end and small-sized construction machinery is also a key focus for domestic players.
 - As a result of the government putting more emphasis on environmental protection, opportunities may exist in more environmentally-friendly construction machinery equipment.
- ***Challenges facing the industry***
 - Domestic labor costs and raw material prices have significantly increased over recent years.
 - Potential challenges could exist if there is slow down in real estate development as a result of the current world financial crisis.
 - Exports under pressure caused by RMB appreciation.

CHINA CONSTRUCTION MACHINERY COMPONENTS INDUSTRY

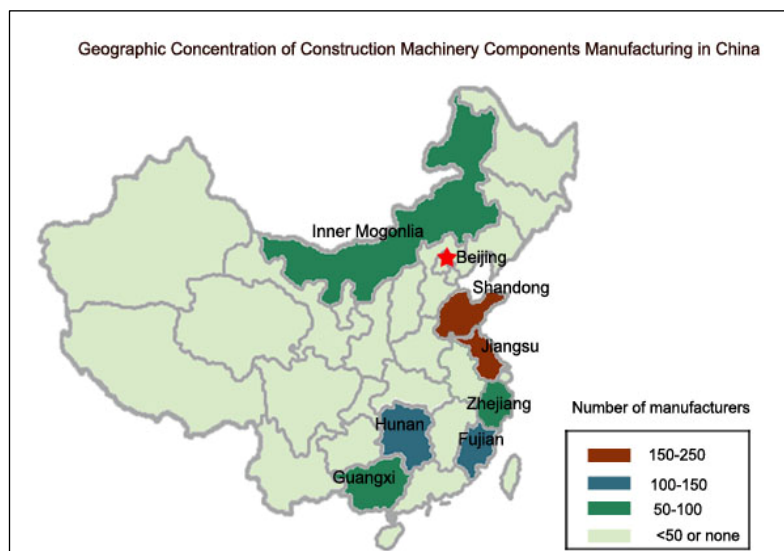
Market overview

- Industry is highly fragmented; 60% of players are small private Chinese companies, which mainly serve the low-end market and compete on price.
- The mid to high-end segments are dominated by foreign brands (both imported products and produced locally by foreign-invested companies).
- Nevertheless, consolidation and technology improvement are underway, especially among large State-Owned Enterprises (currently making up ~20% of the players).
- Market penetration for domestic and foreign players varies by different component sectors; for example, ~90% of *key components for hydraulic excavators* are imported, while ~90% of *key components for loaders* are produced by domestic Chinese players.
- Overall, the components sector is expected to continue growing in conjunction with the growth of the construction machinery industry.

Competitive landscape - China's Construction Machinery Components industry

Geographic concentration

- There are about 800 – 1,000 manufacturers in the construction machinery components industry in China.
- The key production bases of construction machinery components are very similar to those of construction machinery.





- As shown in the map below, these manufacturers are mainly concentrated along the East coast provinces such as *Shandong, Jiangsu, Zhejiang, Fujian*, and other areas such as *Hunan, Guangxi and Inner Mongolia*.
- The industry is highly fragmented; about 60% of the players are small and medium-sized private Chinese manufacturers with limited product portfolio and poor technology levels.
- The remaining 40% of the players are either large state-owned enterprises or foreign-invested companies.
- There are mainly two types of components manufacturers:
 1. Subsidiaries of domestic construction machinery conglomerates (which mainly produce components for their own brand machines);
 2. Manufacturers specialize in certain product segments.

Key foreign players of construction machinery components

- There are about 150 – 200 foreign manufacturers in the industry; mainly from the *US, Germany, Japan, Italy and South Korea*.
- Most of these foreign players produce both construction machinery and construction machinery components and dominate the mid to high-end segments of the market.
- Some foreign players have established manufacturing facilities in China, e.g. *Bonfiglioli (Italy), ArvinMeritor (US), Linde (Germany)*, etc.
- The following table shows the key foreign players that have a manufacturing presence in China.

Table: Key foreign players with manufacturing presence in China

Company	Country of origin	Year of entry	Location	Products portfolio	Description
<i>Linde</i>	German	1993	Fujian	<i>Electronic controls, peripheral equipment, directional control valves, swing drives and hydraulic axles.</i>	<ul style="list-style-type: none"> • Established a WFOE in Fujian in 1993 • Manufacturing base is in Fujian
<i>Bosch</i>	German	1909	Shanghai	<i>Automotive technology, industrial technology and consumer goods and building technology</i>	<ul style="list-style-type: none"> • Totally 38 subsidiaries in China • Total sales reached Euro 1.8 billion in 2007

Rothe Erde	German	2002	Zhejiang	<i>Slewing bearings steel balls, and other related products</i>	<ul style="list-style-type: none"> Established a JV in Jiangsu in 2002 The biggest manufacturer specialized in large diameter slewing bearings in China
Volvo Construction	Sweden	2002	Shanghai	<i>Expansible bolt Filter element, bottom dipper teeth system</i>	<ul style="list-style-type: none"> Established a WFOE in Shanghai in 2002 The manufacturing base in Shanghai
Cummins	USA	1979	Beijing	<i>Engine, dynamo, alternator and fuel system</i>	<ul style="list-style-type: none"> Established 14 JV and WFOE in China Total investment reached USD 0.24 billion in China
Eaton	USA	1993	Shanghai	<i>Hydraulic dynamical components and system</i>	<ul style="list-style-type: none"> Established 15 JV and WFOE in China
ArvinMeritor	USA	1983	Shanghai	<i>Axle and vehicle accessory</i>	<ul style="list-style-type: none"> Established 3 JV and 7 WFOE in China
Cascade Corporation	USA	1987	Fujian	<i>Forklift truck attachment, construction attachment</i>	<ul style="list-style-type: none"> Establish 5 WFOE in Hebei and Fujian Provinces
Bonfiglioli	Italy	2003	Shanghai	<i>Speed reducers and speed aviators, electric motors, electric drives, accessory, gearboxes for mobile machinery & wind</i>	<ul style="list-style-type: none"> Established a WFOE in Shanghai in 2003 Manufacturing base is in Shanghai

Key domestic players of construction machinery components

- In general, there is a gap between domestic and foreign components manufacturers in terms of production capabilities and technology level.
- Domestic components manufacturers have limited capabilities in producing some core components such as *hydraulics, transmissions* and *electronic parts*; the majority of domestic machinery manufacturers are relying on foreign brands.
- This has resulted in a “bottleneck” for the development of the domestic construction machinery industry.
- The low value-added components sectors are dominated by domestic products; and increasing competition in the low-end market is squeezing the profits of domestic component manufacturers.
- As a result of the intense price competition in the low-end markets, many domestic manufacturers are upgrading their technology levels by increasing investment in R&D or absorbing advanced technology via cooperation with foreign players.
- In addition, many domestic components manufacturers are seeking potential partnerships with downstream construction machinery manufacturers.
- The table on the next page shows the top 10 domestic players of the construction machinery components industry

Table: Key domestic manufacturers of construction machinery components in China

Company	Year of establishment	Location	Key Products portfolio	Description
Hangzhou Advance Gearbox Group Co., Ltd.	1960	Zhejiang	<i>Designing and manufacturing transmission and powder metallurgical products</i>	<ul style="list-style-type: none"> Company owns 2,800 employees, 9 plants and 18 affiliated companies Sales revenue reached RMB 1.8 billion
Yinlun Co., Ltd	1958	Zhejiang	<i>Oil coolers, intercoolers and modules</i>	<ul style="list-style-type: none"> Sales revenue achieved RMB 0.83 billion in 2007
Yuci Hydraulics Co., Ltd	1965	Shanxi	<i>High performance hydraulic components such as vane pumps, gear and accumulators, various hydraulic power packages and hydraulic castings with complex chambers</i>	<ul style="list-style-type: none"> Has 2,300 employees Sales revenue reached RMB 410 million
Xuzhou hydraulic component factory CO.,Ltd.	1975	Zhejiang	<i>Hydraulic cylinder, valve and hydraulic system</i>	<ul style="list-style-type: none"> Has 800 employees Sales revenue reached RMB 0.35 billion
Zhongnan Transmission Machinery Co., Ltd	1965	Hunan	<i>Gearbox, engine gearbox accessory, gear, steel wire rolling machine, tobacco machine, railway locomotives etc.</i>	<ul style="list-style-type: none"> Has 2,900 employees Sales revenue reached RMB 450 million
Zhejiang Linhai Haihong Group	1970	Zhejiang	<i>Valve and hydraulic components</i>	<ul style="list-style-type: none"> Sales revenue reached RMB 0.3 Billion in 2007 Has 400 employees
Sichuan Changjiang hydraulic components Co. Ltd	1937	Sichuan	<i>Hydraulic cylinders, gear pumps, gear motors, multiple directional valves, hydraulic tools and hydraulic systems</i>	<ul style="list-style-type: none"> One of the largest 500 mechanical industry enterprises in China
Jinan Hydraulic Pump Co., Ltd	1954	Shandong	<i>Mid-high voltage gear pump and high voltage gear motor</i>	<ul style="list-style-type: none"> Sales revenue reached RMB 0.1 billion in 2007
Maanshan Fangyuan Slewing Ring Co., Ltd	1984	Anhui	<i>Three-row roller slewing ring, cross-rolling slewing ring and two-row roller slewing rings, altogether 8 types of slewing rings</i>	<ul style="list-style-type: none"> Sales revenue reached RMB 0.2 billion in 2007

(table continued)

Yantai Fuye Machinery Co., Ltd	1960	Shandong	<i>101—228mm various distance series and matching products with carrier roller, track roller, idler roller and driving roller</i>	<ul style="list-style-type: none"> Annual output of 20,000 pedals, 80,000 track roller and carrier rollers in 2007
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Key market segments

The following section focuses on four types of core components for all types of construction machinery which are:

1. *Hydraulic components*
2. *Transmission components*
3. *Engines*
4. *Electrical components*

In line with specialized component manufacturers, these core components are segmented by function⁸

1. Hydraulic components

- There are about 100 – 150 domestic hydraulic component manufacturers.
- Key foreign manufacturers include *Nabtesco, Eaton, Rexroth, Linde, etc.*
- Key domestic manufacturers include *Yuci Hydraulics, Xuzhou Hydraulics, Sichuan Changjiang Hydraulics, etc.*
- Due to lack of advanced technology and manufacturing techniques, domestic products are regarded as having low quality and not being reliable.
- Domestic hydraulic component manufacturers serve the low-end of the market; the mid to high-end hydraulic components are mostly served by imports.
- Major types of construction machinery, including *graders, excavators, scrapers, cranes, lifts* and *rotary drilling rigs*, are reliant on imported hydraulic components – 90% of hydraulic parts for domestic *excavators* are imported.
- Domestically produced *loaders* and *fork-lift trucks* (considered to be the low-end of the market) mainly use domestically produced hydraulic parts.

⁸ In the section "Import and export analysis", construction machinery components are categorized based on HS code, not by function.

- Domestically produced *loaders* and *fork-lift trucks* use a hydrodynamic transmission system which is considered to be a fairly basic level of technology for hydraulic parts.

2. Transmission components

- There are about 80 – 120 domestic transmission components manufacturers.
- Key foreign manufacturers include *Bonfiglioli, Brevini, Rexroth, etc.*
- Key domestic manufacturers include *Hangzhou Gearbox, Zhongnan Transmission, Fuye Machinery, etc.*
- Mid to high-end transmission components are dominated by foreign brands; in particular, *decelerators, multi-way valves, high-end driving axles* and *gearboxes*.
- Domestic transmission components serve the low-end market; in particular, domestic *loaders* and *fork-lift trucks* use domestic transmission parts.
- Large domestic manufacturers are seeking technology improvement in transmission parts for large-scaled *loaders* and static transmission system.

3. Engines⁹

- There are about 150 – 200 domestic engine manufacturers (not necessarily only for construction machinery).
- Key foreign manufacturers include *Cummins, Deutz, etc.*
- Key domestic manufacturers include *Shanghai Diesel, Dongfeng Automotive, etc.*
- High-end engine segment is dominated by foreign brands; in particular, heavy-duty engines and engines for special environments (e.g. desert).
- Domestic engine components are used in the low to mid-end markets; in particular, domestic engines are mainly used in domestic brand *loaders* and *bulldozers*.
- Many domestic manufacturers are focusing on the development of heavy-duty engines and environmentally-friendly engines (e.g. engines with electronic fuel injection).

4. Electrical component

- There are many domestic electrical components manufacturers (not necessarily only for construction machinery).
- Key foreign manufacturers include *Schneider, Siemens, etc.*
- Key domestic manufacturers include *People Electric, Baiyun Group, etc.*

⁹ Engines are not included in the import and export analysis because it is a general component for many other types of machines that are not construction-related; the same for Electrical components

- Mid to high-end electrical components are dominated by foreign brands.
- Domestic companies are committed in the R&D of *mechanical electrical hydraulic Integration technology*, which is used for electrical monitoring, computer-controlled transmission systems, automatic lubrication systems and automatic weighing systems.

Import and export analysis

Overview

- In 2010, China's imports of construction machinery components reached USD 3261 million of USD representing increase of 63.22% from 2009.

Table: China import from the world by country 2008-2010

Rank	Country	January - December			% Share			%Change - 10/09 -
		2008	2009	2010	2008	2009	2010	
0	-- World --	2536.60	1998.46	3261.84	100	100	100	63.22
1	Japan	758.20	530.42	1236.27	29.89	26.54	37.9	133.08
2	Korea, South	546.06	509.92	910.91	21.53	25.52	27.93	78.64
3	United States	289.30	235.31	316.65	11.41	11.77	9.71	34.57
4	Germany	300.01	195.78	286.68	11.83	9.8	8.79	46.43
5	Sweden	74.80	44.69	71.59	2.95	2.24	2.2	60.19
6	Italy	45.92	34.95	61.18	1.81	1.75	1.88	75.06
7	Singapore	69.28	38.90	44.25	2.73	1.95	1.36	13.76
8	France	63.45	48.90	41.46	2.5	2.45	1.27	-15.21
9	Malaysia	65.90	50.41	30.00	2.6	2.52	0.92	-40.49
10	United Kingdom	39.72	36.22	29.85	1.57	1.81	0.92	-17.58

Source: China Customs

- Italy ranked 6th position as the supplier countries. It export 61.18 million of USD with 1.88% market shares and an increase of 75.06% compare to 2009.

Table: China import from the world by country 2009-2011

Rank	Country	January - October			% Share			%Change - 11/10 -
		2009	2010	2011	2009	2010	2011	
0	-- World --	1599.87	2610.64	3329.75	100	100	100	27.55
1	Japan	390.58	974.97	1305.13	24.41	37.35	39.2	33.86
2	Korea, South	397.45	768.16	862.15	24.84	29.42	25.89	12.24
3	Germany	159.86	222.48	307.69	9.99	8.52	9.24	38.3
4	United States	202.20	246.08	244.28	12.64	9.43	7.34	-0.73
5	Sweden	38.54	54.91	83.89	2.41	2.1	2.52	52.77
6	Italy	27.85	48.15	75.82	1.74	1.84	2.28	57.46
7	Norway	55.77	16.22	45.64	3.49	0.62	1.37	181.36
8	France	44.61	35.67	43.62	2.79	1.37	1.31	22.28
9	Malaysia	46.40	26.25	41.98	2.9	1.01	1.26	59.93
10	Taiwan	5.72	9.68	34.50	0.36	0.37	1.04	256.36

Source: China Customs

- Italy keeps ranking the 6th position as the supplier country in the China import from world in the first ten months of 2011.
- China total import from the world 3329.75 million of USD with an increase of 27.55 compare to the same period of previous year.
- Italy achieved 75.82 million of USD and a 57.46% increase compare to 2010.

Table: China import from the world by HS code 2008 – 2010

HS	Description	January - December			% Share			%Change
		2008	2009	2010	2008	2009	2010	- 10/09 -
	-- World --	2536.60	1998.46	3261.84	100	100	100	63.22
843149	Parts Of Cranes, Work-Trucks, Shovels, And Others	1812.66	1388.55	2562.16	71.46	69.48	78.55	84.52
843143	Parts Of Boring Or Sinking Machinery	293.01	310.39	301.89	11.55	15.53	9.26	-2.74
843139	Parts Of Lifting, Handling, Loading Or Unloading Machinery	165.97	102.01	123.21	6.54	5.1	3.78	20.78
843120	Parts Of Fork-Lift And Other Works Trucks	132.84	71.36	116.77	5.24	3.57	3.58	63.63
843131	Parts Of Lifts, Skip Hoist Or Escalators	117.39	97.68	103.82	4.63	4.89	3.18	6.29
843141	Buckets, Shovels, Grabs And Grips Of Excavating Ma	13.65	27.99	51.09	0.54	1.4	1.57	82.57
843142	Bulldozer And Angle dozer Blades	1.07	0.48	2.90	0.04	0.02	0.09	500.97

Source: China Customs

- The product category “HS 843149 Parts of Cranes, Work-Trucks, Shovels, And Others” have the biggest market percentage 78.55% among all the construction components.
- China imported this product category 2562.16 million of USD in 2010 with an 84.52% increase compares to 2009.

Table: China import from the world by HS code 2009-2011

HS	Description	January - October			% Share			%Change
		2009	2010	2011	2009	2010	2011	- 11/10 -
	-- World --	1599.87	2610.64	3329.75	100	100	100	27.55
843149	Parts Of Cranes, Work-Trucks, Shovels	1090.19	2069.45	2628.00	68.14	79.27	78.93	26.99
843143	Parts Of Boring Or Sinking Machinery	266.56	231.65	244.37	16.66	8.87	7.34	5.49
843139	Parts Of Lifting, Handling, Loading Or Unloading Machinery	85.00	95.31	179.62	5.31	3.65	5.39	88.47
843120	Parts Of Fork-Lift And Other Works Trucks	56.10	89.40	137.79	3.51	3.43	4.14	54.12
843131	Parts Of Lifts, Skip Hoist Or Escalators	79.20	83.80	99.17	4.95	3.21	2.98	18.35

843141	Buckets, Shovels, Grabs And Grips Of Excavating Machinery	22.44	40.19	39.61	1.4	1.54	1.19	-1.44
843142	Bulldozer And Angle dozer Blades	0.36	0.85	1.19	0.02	0.03	0.04	39.43

Source: China Customs

- In the first ten months of 2011, the most construction components China imported is the product category "HS 843149 Parts of Cranes, Work-Trucks, Shovels, And Others".
- It was imported 2628 million of USD with 78.93% market percentage and a increase of 26.99% compare to the same period of previous year.

Key trends and market dynamics – construction machinery components sector

- ***Fast growth expected within next few years***
 - The rapidly growing construction machinery industry the major driving force for development of China's construction machinery components sector
 - Domestic demand mainly comes from machinery manufacturing and the spare parts & after-sale services markets
 - In addition, export demand is also expected to grow as China's construction machinery components have improved in quality and still maintain some price advantage
- ***Intensifying competition in low to mid-end markets***
 - Due to the overall low technology level, the majority of domestic manufacturers have homogenous product mixes in key segments, which results in intense price competition
 - In addition, there are new foreign entrants, some of whom are targeting the mid-end market
- ***Trend of vertical and horizontal integration***
 - Similar to the machinery industry, large domestic components manufacturers are involved in M&A activities targeting medium-sized players to gain an advantage in economies of scale and an improved product mix
 - One result of the intensifying competition is that component manufacturers are seeking opportunities to cooperate with downstream machinery manufacturers
 - This kind of integration is expected to help the industry upgrade; both the machinery and machinery components sectors



- *Continuous upgrading of technology*
 - Upgrading technology levels is crucial for China's construction components industry because of the development imbalance between the machinery and machinery components sectors
 - With government support, domestic components manufacturers are focusing on R&D and the production of key components (hydraulic parts, transmission parts, engines and electrical parts)

SALES AND DISTRIBUTION CHANNELS

The following section discuss sales and distribution channels for both construction machinery and construction machinery component sectors

Overview

- Sales and distribution channels differ depending on manufacturer's industry (construction machinery or components), company type, business size and product segment.
- Direct sales and the use of agents are the two major distribution channels for both domestic construction machinery and domestic components players; foreign players normally use agents.
- 4S stores for construction machinery are appearing as a new sales channel to provide more value-added services.
- There is an emergence of more distribution and sales channels appearing in the construction machinery industry such as financial leasing and financing option on sales.
- Volume of online sales is also increasing and is an additional distribution channel for construction component sales.

Key types of distribution channels

The following sections explain the key types of distribution channels in greater detail

Direct sales

- In the construction machinery industry, direct sales are a common sales model for product segments with small market size and high unit price (e.g. *cranes*).
- Manufacturers in segments with a small market size and high unit price usually only start production after receiving an order from the customer.
- In addition, direct sales are usually adopted by small to medium-sized machinery or components manufacturers.
- Large SOE machinery and component manufacturers usually adopt a combination of direct sales and sales via agents, while large foreign-invested enterprises usually prefer to only use agents.
- Manufacturers are also seeking new areas to generate revenue in the after-sales service sector, such as opening 4S service stores.

- The risk of direct sales is that it requires more capital and the expenditure of greater effort in terms of channel development compared to using agents.

Sales via agents

- In the construction machinery industry, sales via agent are common in product segments with a large market size (e.g. *loaders, small excavators*).
- There are about 1,500-2,000 domestic agents serving the construction machinery and components sectors; the majority is small companies with few employees.
- Compared with foreign agents, local agents are less sophisticated in terms of brand management and scope of services.
- It is important to find a qualified agent, although this will become increasingly difficult as many have contracts with companies already established in China
- It is expected that sales via agents will become the dominant sales model as the market is becoming more segmented and the competition is intensifying.
- Some large agents started testing the idea of 4S stores for construction machinery manufactures and online sales to provide better service.

Financial leasing and financing options for sales

- Financial leasing and financing options for sales are only applicable to the construction machinery industry.
- Financial leasing and financing options for sales are still underdeveloped in China, but is developing fast for products with high price and low turnover rate (e.g. *large cranes* and *excavators*).
- Financial leasing benefits manufactures as it may make it more economical for companies to acquire machinery, thereby and improving revenue and helping new product entry into the market.
- Large manufacturers (e.g. *Caterpillar, Hyundai*) have set up their own financial leasing departments in China.
- Financial leasing benefits customers with limited financial resources or those who only need specialized equipment for a short period of time.
- The lack of clear regulations and the undeveloped financial services sector in China are the main barriers to financial leasing and financing options for sales.
- Financial leasing is also impacted by the second-hand machinery market; the lease price of new machinery can be the same as the purchase price for used machinery.
- As China's financial services sector becomes more advanced, leasing and financing options for sales will provide opportunities to construction machinery manufacturers as it will allow more companies to have access to the equipment.
- It has yet to be seen how the current financial crisis will affect the leasing and financing options in the construction machinery industry.

REGULATORY ENVIRONMENT FOR CONSTRUCTION MACHINERY AND COMPONENTS SECTORS

Overview of key laws and regulations

- There are many laws and regulations relevant to the construction machinery and construction machinery component sectors.
- They primarily cover safety, legal usage, productivity and technical standards of machines and equipment, or the import and export tariff of certain types of machines and equipment.
- The following table lists several important laws and regulations that are relevant and should be considered by the Italian players – mostly related to import and export of construction machinery and equipment.

Table: Key laws and regulations related to the construction machinery and components sectors

Regulation	Description	Effective date	Issuing government body
<i>Catalogue of Products and Technology Encouraged to Import</i>	<ul style="list-style-type: none"> • The catalogue lists advanced technology or important equipment that the Chinese government encourages to be imported • Favorable tax reductions will be given to this technology and equipment when imported • It covers several types of construction machinery and components, detailed in the next page 	Sept 2007	National Development and Reform Commission
<i>Catalogue of Non-Duty-Free Commodities Imported for Foreign-Funded Projects</i>	<ul style="list-style-type: none"> • This catalogue contains a list of production equipment imported to be used for foreign-funded projects and are NOT exempt from import duties • This list includes several types of construction machinery, detailed in the next page 	March 2007	Ministry of Finance
<i>Notice Regarding the Adjustment in Export Reform Rate for Certain Commodities</i>	<ul style="list-style-type: none"> • This notice reduces or completely eliminates the export VAT refund rates for a broad range of commodities • Profits of exporters in many industries may fall significantly • It affects 3 types of construction machinery, detailed in the next page 	July 2007	National Development and Reform Commission
<i>Measures Governing Inspection and Supervision of Importation of Old Machinery and Electronic Products</i>	<ul style="list-style-type: none"> • To inspect and supervise old machinery and electronic products allowed to be imported into, sold and used within China • Imported old machinery and electronic products should conform to the standards concerning safety, sanitation and environment 	May 2003	General Administration of Quality Supervision, Inspection and Quarantine
<i>Regulations on Inspecting Imported Second-hand Excavators</i>	<ul style="list-style-type: none"> • To regulate the inspection of imported second-hand excavators, focusing on safety, productivity, and weather they conform with environmental standards • This is only applicable to imported "second-hand excavators" 	Jan 2008	National Development and Reform Commission

(table continued)

Regulations on Supervising and Managing the Safety of Crane	<ul style="list-style-type: none"> To regulate the leasing, disassembling, and usage of <i>cranes</i> To supervise the safety of using <i>cranes</i>, in order to avoid injuries often incurred by crane operators 	June 2008	Ministry of Housing and Urban-Rural Development
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Policies related to import & export of construction machinery and components

Some of the policies regarding import and export of construction machinery and components by foreign companies (including Italian players) are discussed in greater details below

For general reference, it is important to note that policies and regulations change and evolve quickly in China so it is always important to stay up to date.

1. Catalogue of Products and Technology Encouraged to Import

- The objective is to encourage the importation of advanced technology or important equipment that domestic companies are not capable of producing and to strengthen domestic independent-innovation.
- The importation of two advanced technologies for construction machinery are encouraged:
 - Design and manufacturing technology of *shield hauler, hard rock mole*
 - Design and manufacturing technology of *large-scaled bucket wheel excavator* (e.g. production capacity of 200,000 – 300,000 tons per day)
- The importation of five types of important construction machinery are encouraged:
 - Full facer* with the cutter diameter > 13m
 - Continuous soil mixing plant* with mixing width > 3m
 - Crawling crane* with load of lifting > 300 tons
 - High-graded *expressway slurry-sealing machine* with hopper > 10 m³ and the slurry > 3 tons
 - Asphalt pavement planers* with milling width > 2.5m and milling depth > 3cm

- Design and manufacture of large-scaled construction machinery and key components are also encouraged
- 2. *Catalogue of Non-Duty-Free Commodities Imported for Foreign-funded Projects***
- The catalogue is for foreign companies located in China wishing to import equipment for local production; the equipment listed are no longer duty-free.
 - The objective is to promote the domestic industries and encourage companies to purchase construction machinery and components from domestic manufacturers.
 - Domestic companies already have the production capability or technology to produce the equipment listed in the catalogue.
 - Several types of construction machinery are included: *cranes, forklift trucks, road rollers and graders, loaders, excavators, drilling machines, mortar or concrete mixers.*
- 3. *Notice Regarding the Adjustment in Export Refund Rate for Certain Commodities***
- The objective is to lower the VAT refund rates for a broad range of products – mostly those that are socially or environmentally harmful (e.g. pollution-causing, high energy or natural resource consuming) and products from low value-added industries (e.g. *clothing and shoes*).
 - The export refund rates for 3 types of construction machinery and components were adjusted:
 - *Portable rotary pneumatic tool*: from 17% to 9%
 - *Other kinds of portable pneumatic tool*: from 17% to 9%
 - *Pneumatic tools and components*: from 13% to 9%

CONSIDERATIONS FOR ITALIAN COMPANIES

The following section introduces potential opportunities and potential barriers for Italian players in both construction machinery and construction machinery component sectors

Potential opportunities for Italian companies

- ***Rapid market growth, especially in some segments***
 - Despite the world economic crisis, China construction machinery and component sectors are expected to maintain fast growth, mainly driven by massive investment in domestic infrastructure construction which is one of the focus of China's stimulus plan.
 - Regarding export demand, to some extent the increasing exports to Asian countries (e.g. *Japan* and *India*) will make up for the reduction exports to European countries and the USA.
 - In particular, strong growth in some segments (e.g. *hydraulic excavators, drilling machinery*) representing good opportunities.
- ***Good potential for foreign manufacturers in some sectors***
 - Italian suppliers may have better opportunities in areas that require more advanced technology and manufacturing processes, which are not easily available to Chinese suppliers.
 - In particular, regarding construction machinery there are opportunities in segments requiring high-level design and manufacturing capabilities, e.g. *hydraulic excavators, large-scale cranes*, etc.
 - Regarding the component sector, potential mainly lies in the core components (*hydraulic parts, transmission parts, engines* and *electrical parts*); majority of high-end components with high value-added are still relying on import.
 - There may also be potential in alternative areas, such as *environment-friendly machinery, small-sized machinery, and second-hand machinery*.
- ***Strong perception of foreign brands – including some Italian brands***
 - Reliability, duration, after-sales service and purchase method are some key factors when Chinese customers choose construction machinery and component suppliers.

- In general, foreign brands (including locally manufactured or imported) are perceived to be high-level, reliable products with better after-sale services than domestic brands.
- In addition, foreign brands usually provide more flexibility regarding purchase methods; they are more mature in financial sale or leasing practice.

Potential barriers for Italian companies

- ***Higher price and longer lead time of imported products***
 - In general, domestic machinery and components cost much less than imported products; for example, imported *cranes* cost two to three times that of domestic ones, and the price gap is significant as there is already a high unit price.
 - In addition, longer lead time is a disadvantage compared with domestic machinery and component manufactures, due to a complicated import process and geographic distance.
 - The same applies for imported second-hand machinery.
- ***Brand awareness and track record in China***
 - Brand and track record is another key factor for Chinese customers to consider when making purchase decision, especially for those products with high unit price.
 - Currently large international and domestic players dominate the industry.
 - Hence, it would be challenging for Italian SMEs without a previous track record in China to enter and compete with well-established brands.
- ***Availability of spare parts & after sales service***
 - Construction machinery relies heavily on the easy availability of spare parts, imported products take more time and cost more money.
 - Difficult to offer prompt maintenance services without a local presence.
 - Competition is also from some good local distributors who are capable to offer spare parts and after-sales service as well.



- ***Challenge in finding good, committed agents / distributors***
 - Compared with foreign agents, majority of domestic agents still lack of brand management knowledge and can only provide limited range of services.
 - In addition, most of the good distributors are already representing foreign brands, and some of them have exclusive rights for certain brands.
 - Thus it will be challenging to find well-qualified distributors, especially for new entrants.

- ***Government regulations***
 - Due to manufacturing hazards, materials, and waste that firms in this industry produce, local and provincial governments require environmental approvals to operate in the industry. Requirements to comply with environmental legislation and regulations are important legal barriers facing a new manufacturer to the industry.

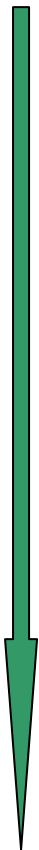
Practical options for Italian players approaching China market

- The table below shows possible ways for Italian construction machinery and components manufacturers to approach or enter the Chinese market; the level of investment and commitment normally increases from option 1 to option 5, but so should the potential return.

Table: Practical options for Italian machinery suppliers approaching China

Option	Description	Pros	Cons
1. Use Distributors/ agents	<ul style="list-style-type: none"> Distributors will import and sell machinery or components in China; need one with strong network No legal entity needed 	<ul style="list-style-type: none"> Requires no direct investment in China Relatively low risk Good way to test the market Make use of distributors' network to develop brand awareness 	<ul style="list-style-type: none"> May be challenging to identify a committed distributor Results are uncertain Establish China track record may take time
2. Set up a Rep. Office (RO)	<ul style="list-style-type: none"> Manage distributors Network and liaison Able to conduct sales and marketing activities 	<ul style="list-style-type: none"> Simplest way of establishing direct China presence Relatively low investment Allows company to learn local market conditions May develop business/ client network and some after-sales support 	<ul style="list-style-type: none"> Results are not certain, but better than just relying on distributors Having limited authority to make decision
3. Establish a Joint Venture with a local partner	<ul style="list-style-type: none"> Joint venture with a local machinery or components manufacturer; cooperative or equity JV Manufacture and sell domestically and internationally 	<ul style="list-style-type: none"> May provide cost advantage from manufacturing or assembling locally Faster time to market Benefit from partners' market knowledge and distribution network Lower initial investment than WFOE Be able to offer better after-sales service and technical support 	<ul style="list-style-type: none"> Generally risky It takes time and effort to find an appropriate partner Chinese partner have little to offer in terms of technology, but may provide market access Difficult to manage relationship with partner
4. Set up a WFOE (Manufacturing or FICE¹⁰)	<ul style="list-style-type: none"> 1) Manufacturing WFOE, or 2) FICE The increasingly popular choice for many foreign companies 	<ul style="list-style-type: none"> Full control and ownership of the company Be able to offer better after-sales service and technical support Highest return and most sustainable in the long run 	<ul style="list-style-type: none"> Higher investment and commitment required Significant time to setup / develop the business
5. Acquisition of local company	Alternative to WFOE or JV	<ul style="list-style-type: none"> Enjoy the benefits associated with JVs Avoid the problems associated with having a JV partner Access to distribution network of local company 	<ul style="list-style-type: none"> Potentially highest investment required Due diligence necessary Existing distribution network not suitable for distributing high-end products

Lower risk / commitment / returns



Higher risk / commitment / returns

¹⁰ See Appendix A.1 "Glossary of key acronyms and terms"

- *Important note:* these options represent the average scenario and should be viewed as a general reference; the recommended option for each company will differ depending on company specific considerations like size, product range, strategy, etc.
- Each of the above options are described in greater details in the next sections.

Use distributors/ agents or set up Rep. Office

- Using distributors or setting up representative offices are the most common ways to enter the Chinese market with relatively low levels of risk and capital involved
- This is a potentially viable option for machinery exporters, due to high product value, and low volume.
- On other hand, there are still disadvantages over domestically manufactured machinery and components in terms of price and lead time.
- Establishing a RO, however, is a good way to test the market and gauge market opportunity.
- It also allows the foreign company to offer better after-sales service than just a pure import strategy.

Establish a JV with a local partner

- Establishing a joint venture with a local partner, if successful, can represent a faster time to market, and the foreign company also benefits from the local knowledge of the Chinese partner.
- There is also an existing customer base and sales network and is a good start to tap into the domestic market.
- However, when looking for JV partners, Italian companies should be very cautious and conduct proper due diligence on potential partners – JVs are in general considered risky and as many as 50% may fail over time.
- It is notable therefore that this has been a relatively popular strategy in construction machinery and components sectors.

Set up a Wholly Foreign-Owned Enterprise (WFOE)

- WFOEs are the increasingly popular entity of choice for many foreign companies, including construction machinery and construction machinery components manufacturers.

- A WFOE can take many forms; the two most common in this case are Manufacturing WFOE or FICE (Foreign Invested Commercial Enterprise).
- A Manufacturing WFOE allows the foreign company to manufacture and sell its manufactured products locally, while FICE allows the foreign company to import machinery and components, sell it locally¹¹ and also offer after-sales service and repairs.
- Companies establishing WFOE have full control over the development strategies and business processes, however the risk and investment required is potentially higher than having a JV partner.
- Thus, this option is largely taken by some international players(e.g. *Terex, Hyundai*) who already have significant China experience through setting up JV with Chinese counterparts in the previous stage.

Acquisition of a local company

- Over the past few years, there has been a trend of acquisition of a local company among large international players (both vertical and horizontal acquisition).
- In practice, acquisition of a local company usually requires large commitment of capital and time, and the results may be influenced by some key factors, e.g. the background of the target local company and transaction value.
- M&A activity typically doesn't apply to Italian SME's entering China, but it is worth mentioning as one of the option theoretically viable for companies approaching the market.

¹¹ Note there are many forms of FICE with different types of business scope, e.g. wholesale, retail, etc.

SUMMARY AND CONCLUSION

- Ultimately, China's continued investment in infrastructure development will drive demand for both construction machinery and construction machinery components.
- The economic stimulus plan recently enacted by the central government will assist in the continued infrastructure development, despite the world economic crisis.
- Domestic Chinese players, in both construction machinery and construction machinery components, are improving their technology levels and manufacturing processes; future competition in the medium to high end segments of both industries will likely become fiercer.
- Because of the eventual technological development of Chinese competitors, it is important for Italian companies to take advantage of the current technological gaps that exist.
- Opportunities exist and vary depending on the specific segment; for an Italian player considering entry in the market, it is important to understand the specific risks and opportunities associated with the target segment.
- Individual company strategy should determine the market entry option for Italian players; however, regardless of entry option, considering the geographic location is important in terms of being near suppliers or customers.
- Italian players will have to focus on the medium to high end of the market segments while the technology gap exists, and focus on construction machinery or construction machinery components that require a high level of technology or advanced manufacturing techniques.
- Choosing appropriate sales agents is essential for successful market entry into China in order to reach the most suitable customers and suppliers.
- Entering China's market may be challenging for Italian SMEs without a previous track record in China as they would be competing with well established foreign and local brands.
- However, whenever possible, SME's should try to "follow" their customers in China if already present.



APPENDIX

A.1 Glossary of terms

A.2 HS code, customs duties and VAT for construction machinery and construction machinery components

A.1 Glossary of key acronyms and terms

Terms	Full name	Definition / Explanation
CAGR	Compound Annual Growth Rate	An interest rate calculated as $CAGR = (FV/PV)^{1/n} - 1$, where FV is the future value, PV is the present value, and n is the number of years
FDI	Foreign Direct Investment	Investment made to acquire lasting interest in enterprises operating outside of the economy of the investor
FICE	Foreign Invested Commercial Enterprise	A variant of a WFOE that allows foreign companies in China to engage in commercial activities within China
JV	Joint-venture	Private company and local government enter into a JV and share all responsibility related to investment and management
MEP	Ministry of Environmental Protection	The Ministry of Environmental Protection is charged with the task of protecting China's air, water, and land from pollution and contamination
MOC	Ministry of Commerce	The Ministry of Commerce of the People's Republic of China is an executive agency responsible for formulating foreign trade, export and import regulations, foreign direct investments, consumer protection, market competition and negotiating bilateral and multilateral trade agreements
MOF	Ministry of Finance	The Ministry of Finance of the People's Republic of China is the national executive agency of the government which administers macro economic policies and annual budget; also handles fiscal policy economic regulations and government expenditures for the state
MHRC	Ministry of Housing & Rural-Urban Construction	The Ministry of Housing and Urban-Rural Construction is a ministry of the government of the People's Republic of China which provides housing and regulates the state construction activities in the country
NDRC	National Development and Reform Commission	Mainly responsible for overall economic development policy; its main function is to guide China in the transition to a market economy
NPC	National People's Congress	The National People's Congress is the highest organ of State power of the People's Republic of China. Its main functions and powers include formulation of laws, delegating authority, policy formulation, and supervision of other governing organs.
SME	Small and Medium Enterprises	Companies with fewer than 100 employees are considered to be small; companies with fewer than 250 employees are considered to be medium (500 in the USA). Globally, SMEs account for 99% of all businesses
SOE	State-owned Enterprise	Legal entity created and owned by the government to undertake commercial or business activities; SOEs can be fully or partially owned by the government
WFOE	Wholly Foreign Owned Enterprise	An enterprise in China which is 100% owned by a foreign company or companies. Establishment as a WFOE allows the foreign firm to retain complete control and direction of the operation
4S	-	Sale, Spare part, Service, and Survey

A.2 HS code, custom duties and VAT for construction machinery and construction machinery components

- Import of construction machinery and components are subject to an import tariff rate and an import VAT of 17%.
- The VAT is calculated as follows:

$$\text{TAX Payable} = \text{VAT Rate} \times [\text{Dutiable Value} + \text{Customs Duty}]$$

- The dutiable value of imported goods includes the purchase price and the transport and insurance cost.

HS code, customs duties and VAT for construction machinery

- The following table shows the tariff and VAT rates applicable for construction machinery.
- These selected HS Codes include only and all types of machinery used in the construction industry; machines that are not construction-related are not included.
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Table: Tariff and VAT information for imports of construction machinery

Category	HS Code	Description	Tariff	VAT Rate
Cranes	8426	Ship derricks, cranes, mobile lifting frames, straddle carriers and works trucks fitted	3-13%	17%
Fork-lift trucks	8427	Fork-lift trucks; other works trucks fitted with lifting or handling equipment	9%	17%
Lifts and escalators	8428	lifts, escalators, conveyors	4-10%	17%
Bulldozers and angledozers	842911	Track laying bulldozers and angledozers	7%	17%
	842919	Other kinds of bulldozers and angledozers	7%	17%
Graders and levelers	842920	Graders and levelers	5%	17%
Scrapers	842930	Scrapers	3-5%	17%
Tamping machines and	842940	Tamping machines and road rollers	6-8%	17%
Loaders and excavators	842951	Front-end shovel loaders	5%	17%
	842952	Excavators	8%	17%
	842959	Other kinds of loaders and excavators	8%	17%

(table continued)

Tunneling and drilling	8430	pile-drivers and pile-extractors, tunnelling machinery, drilling machinery	3-10%	17%
Mixing machines	847431	Concrete or mortar mixers	7%	17%
	847432	Machines for mixing mineral substances with bitumen	7%	17%
	847439	Other kinds of mixing machines	5%	17%
Spreading machines	84791021	Machines for spreading bituminous concrete	8%	17%
	84791022	Stabilizer spreading machines	8%	17%
	84791029	Other kinds of spreading machines	8%	17%

Source: China Customs

HS Code, customs duties and VAT for construction machinery components

- The following table shows the tariff and VAT rates applicable for construction machinery components
- These selected HS Codes include 2 kinds of construction machinery components:
 1. components used only or mainly in construction machinery;
 2. components not necessarily used only in construction machinery, but possibly also for other type of machines that are not construction-related.

Table: Tariff and VAT information for imports of construction machinery components

Category	HS Code	Description	Tariff	VAT Rate
Parts of fork-lift trucks and similar	843120	Parts of machinery of heading No.8427	3%	17%
Parts of escalators and similar machines	843131	Parts of lifts, skip hoists or escalators	1-3%	17%
	843139	Parts of other machines of heading No. 8428	5%	17%
Parts of cranes, bulldozers, graders, scrapers, excavators, tamping machines, and drilling machinery	843141	Buckets, shovels, grabs and grips	3%	17%
	843142	Bulldozer or angledozer blades	6%	17%
	843143	Parts of drilling and sinking machinery	4-5%	17%
	843149	Other parts of machinery of heading No. 8426, 8429 and 8430	5%	17%

Source: China Customs