INTRODUCTION

The construction machinery industry is an important segment in most global economies. Construction machinery includes many different types of equipment, including concrete machinery, excavators, hoisting machinery, road machinery and pile driving machinery. These types of machinery are used in a wide range of applications, including building construction, surface mining and infrastructure projects, which include transportation and energy infrastructure construction.

OVERVIEW OF THE GLOBAL CONSTRUCTION MACHINERY INDUSTRY

According to Yengst Associates, a market research firm, global sales of construction machinery exceeded US$142 billion in 2010. The construction machinery industry experienced strong growth between 2003 and 2007, increasing to US$174 billion in sales in 2007 before declining in 2008 and 2009 due to the global economic downturn. Sales in construction machinery experienced an upturn in 2010, and is expected to continue increasing in the following five years through 2015 according to Yengst Associates. The following chart illustrates the global sales of construction machinery between the years 2001 and 2010, as well as the estimated sales revenue for 2011 through 2015.

Global Sales Revenue of Construction Machinery

The market characteristics for the construction machinery industry are different in developed and developing markets. The developed market includes those countries that are thought to be the most developed based on their economic size, wealth, and the quality, depth and breadth of their markets, such as the United States, Japan, the United Kingdom, Germany, France and Canada. The developing market includes those emerging countries with social or business activity in the process of rapid growth, urbanization and industrialization, such as China, India, Brazil, Mexico and South Africa. The demand for construction machinery in developing markets is generally fueled by new construction and government spending on public infrastructure whereas the demand for construction machinery in developed countries is typically driven by maintaining and improving existing infrastructure.
In 2005, China accounted for approximately 9% of the total global sales of construction machinery and has increased its consumption each year since 2005. In 2010, China’s demand for construction machinery was approximately 40% of the global construction machinery market. North America, Europe and Asia Pacific (excluding China) accounted for approximately 20%, 18% and 15% of global consumption, respectively. Although the demand for construction machinery was heavily affected by a decrease in demand in developed markets following the economic financial crisis beginning in September 2008, China continued to drive demand in the construction machinery industry. In 2010, due to the recent upturn in the global economy, the demand in developed markets stabilized and increased along with continued growth in demand from China. The following chart illustrates the global sales of construction machinery by region in 2005 and in 2010.

Global Sales of Construction Machinery by Region, 2005 and 2010

According to Yengst Associates, in 2010 the top ten construction machinery manufacturers in the world based on sales revenue were as follows:

Ranking of Global Top 10 Construction Machinery Manufacturers, 2010(1)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Enterprise Name</th>
<th>Nation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Caterpillar</td>
<td>United States</td>
</tr>
<tr>
<td>2</td>
<td>Komatsu</td>
<td>Japan</td>
</tr>
<tr>
<td>3</td>
<td>Hitachi</td>
<td>Japan</td>
</tr>
<tr>
<td>4</td>
<td>Liebherr</td>
<td>Germany</td>
</tr>
<tr>
<td>5</td>
<td>Volvo Construction Equipment (“Volvo”)</td>
<td>Sweden</td>
</tr>
<tr>
<td>6</td>
<td>Sany Heavy Industry</td>
<td>China</td>
</tr>
<tr>
<td>7</td>
<td>Doosan Infracore</td>
<td>South Korea</td>
</tr>
<tr>
<td>8</td>
<td>Sandvik</td>
<td>Sweden</td>
</tr>
<tr>
<td>9</td>
<td>Zoomlion</td>
<td>China</td>
</tr>
<tr>
<td>10</td>
<td>Terex</td>
<td>United States</td>
</tr>
</tbody>
</table>

Source: Yengst Associates

(1) Sales of mining machinery are included for certain manufacturers. Sany Heavy Industry does not manufacture mining machinery, and therefore its results do not include such sales. Revenue for several private companies has been estimated.
OVERVIEW OF THE CHINESE CONSTRUCTION MACHINERY INDUSTRY

China is an important global player in both the manufacturing and consumption of construction machinery. According to the China Construction Machinery Industry Yearbook, in terms of sales revenue, China’s construction machinery industry ranked fourth overall among China’s machinery industries, following the automobile, electrical appliances and petrochemical machinery industries in 2009.

Sales revenue for construction machinery in China exceeded RMB365 billion in 2010, representing growth of 55.2% from 2009. Sales revenue of concrete machinery, excavators, hoisting machinery, road machinery and pile driving machinery by construction machinery manufacturers in China in 2010 was approximately RMB90.0 billion, RMB80.0 billion, RMB40.0 billion, RMB15.0 billion and RMB6.0 billion, respectively.

The following chart illustrates sales revenue of construction machinery in China for the periods indicated below.

Sales Revenue of the PRC Construction Machinery Industry, 2005 to 2010

Source: China Construction Machinery Business Online
The following chart illustrates the sales revenue in 2010 of construction machinery manufacturers in China for the construction machinery industry in China by type of equipment.

Sales Revenue of the PRC Construction Machinery Industry by Type of Equipment, 2010

- **Excavator**: 22%
- **Concrete Machinery**: 25%
- **Hoisting Machinery**: 11%
- **Road Machinery**: 4%
- **Pile Driving Machinery**: 2%
- **Others**: 36%

**Source**: China Construction Machinery Business Online

In China, the demand for construction machinery is the highest in the infrastructure, real estate and mining industries. In 2010, the infrastructure, real estate and mining industries comprised approximately 40%, 17% and 15%, respectively, of the total demand for construction machinery in China. The following chart illustrates the demand in 2010 for construction machinery by industry in China.

Domestic Demand of the PRC Construction Machinery by Industry in Year 2010 (in terms of Sales Revenue)

- **Infrastructure**: 40%
- **Real Estate**: 17%
- **Construction**: 8%
- **Mining**: 15%
- **Other**: 20%

**Source**: China Construction Machinery Business Online

(1) Real Estate industry only refers to the construction of residential and commercial buildings and Construction industry refers to the construction of industrial buildings.
Factors Driving the Growth of the Construction Machinery Industry in China

China has achieved significant economic growth since the PRC Government’s “open door” economic reforms of 1978. After China’s accession to the World Trade Organization in 2001, China’s economy entered a new phase of growth and its GDP has grown continuously. In 2010, according to the World Bank, China became the world’s second largest economy. China’s nominal GDP grew at a CAGR of 15.0% from 2000 to 2010, according to the National Bureau of Statistics of China.

The following chart illustrates China’s nominal GDP for the periods indicated below.

![China's nominal GDP from 2000 to 2010](chart)

*Source: National Bureau of Statistics of China*

China’s economic development has led to rapid expansion in fixed asset investment. According to the National Bureau of Statistics of China, total fixed asset investments in China grew at a CAGR of 23.8% from 2000 to 2010.

The following chart illustrates the total fixed asset investment in China for the periods indicated below.

![China’s Fixed Asset Investment, 2000 to 2010](chart)

*Source: National Bureau of Statistics of China*
Infrastructure construction, including the construction of railways, highways, power plants and water engineering projects, is expected to play an important role in facilitating the development of the Chinese economy. Infrastructure construction was a key part of the PRC Government’s RMB4.0 trillion stimulus package announced in the fourth quarter of 2008, which resulted in increases in the year-over-year growth of infrastructure fixed asset investment, including railways, highways and urban transportation, particularly in 2009 and 2010. The PRC Government will likely continue to invest in developing China’s infrastructure. Specifically, the PRC Government is expected to continue investing in constructing railways and nuclear power plants in order to solve the shortage of transportation capacity and electricity supplies. According to the Ministry of Railways, China approved railway projects totaling over RMB2,000 billion between 2004 and 2008, of which 70 projects, valued at approximately RMB1,500 billion, commenced in 2009. Considering the typical construction period of three to five years for railway projects, this railway infrastructure investment will likely be sustained over the coming years. According to the National Bureau of Statistics of China, the Ministry of Railways invested RMB707 billion in 2010 on railway infrastructure construction (an increase from approximately RMB600 billion in 2009), and intends to invest approximately RMB2,800 billion during the Twelfth Five-Year Period (2011-2015). The continuous investment in infrastructure construction will likely sustain demand for construction machinery in China.

The PRC Government has also prioritized water engineering projects as an important aspect of its investment in infrastructure. The State Council issued the Decision on the Acceleration of Water Resources Reform and Development (中共中央國務院關於加快水利改革發展的決定) on December 31, 2010, indicating the intent of the PRC Government to increase investment in water engineering projects by an average of approximately 100% of the amount invested in water engineering projects in 2010 for each year during the ten-year period from 2011 to 2020. According to China Construction Machinery Business Online, the PRC Government invested RMB200 billion in water engineering projects in 2010, and is expected to make investments in water engineering projects of approximately RMB400 billion annually, or RMB4 trillion in aggregate for the ten years starting from 2011. In
addition, the PRC Government indicated its plan to provide financial assistance in order to accelerate the development of water engineering and ensure sustainable use of water resources. Under the Decision on the Acceleration of Water Resources Reform and Development, local and municipal governments are also expected to significantly increase investment and increase financial assistance in the area of water engineering.

In addition to government investment in infrastructure, the PRC Government issued in 2010 a notice, the “36 Articles”, defining the tasks and responsibilities of the central and local governments in China in order to encourage private investment. These policies are focused on promoting private investment in certain industries, including basic industries and infrastructure, urban public utilities and social welfare housing. The promotion of private investment in infrastructure development by increasing the development of public utilities in urban areas and social welfare housing may fuel demand for construction machinery.

Investment in the Real Estate Industry

The real estate industry can also affect the demand for construction machinery. China’s accelerated urbanization has led to significant increases in real estate investment. According to the National Bureau of Statistics of China, total real estate investment in China grew at a CAGR of approximately 25.5% from 2000 to 2010. The investment in real estate development in China totaled RMB3,620 billion in 2009. According to the National Bureau of Statistics of China, investment in real estate in China increased by 32.6% to approximately RMB4,800 billion by the end of 2010, which was expected to further increase the demand for construction machinery products. The following chart illustrates the total real estate investments in China for the periods indicated.

China’s Real Estate Investment, 2000 to 2010

In addition, the PRC Government has also announced plans to increase units of residential housing, including social welfare housing. According to the Ministry of Housing and Urban-Rural Development, the PRC Government intends to invest RMB1.3 trillion to complete 36 million units of social housing during the Twelfth Five-Year Plan.

Investment in Mining Industry

The growth of the mining industry in China is also expected to increase demand for construction machinery, particularly excavators. According to BP Statistical Review of World Energy 2009, China is the world’s largest producer and consumer of coal. Coal accounts for 70% of domestic primary energy consumption and is expected to continue to be the main source to meet China’s growing demand for power generation. However, the mechanization rate for mining machinery in China still...
remains relatively low. Currently, the mechanization rate of coal mines in China is approximately 45%, with large and midsized Chinese coal mines, at the most, attaining an approximately 80% mechanization rate. In addition to the current coal mine consolidation policy, this increased focus on will further stimulate demand from the mining industry. Rising labor costs may also contribute to an increase in mechanization. Furthermore, China invested approximately RMB965.3 billion in the mining industry in 2010 and is expected to continue investment in the mining industry to increase access to natural resources, thereby leading to an expected increase in demand for excavators, according to China Construction Machinery Business Online.

Investment in Mining Industry, 2000 to 2010

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Investment in Energy Infrastructure

The growth of the energy industry in China will also increase demand for construction machinery, as construction machinery is widely used in the construction of energy projects such as nuclear power, biomass energy, solar power, and in particular, wind power fields and hydro power plants. For example, an increase in the construction of wind power facilities may lead to an increased demand for crawler cranes which are used in the installation of wind power facilities. Similarly, hydropower projects require earth-moving machinery in their initial phases of construction and cranes in the later phases of construction during equipment installation, and an increase in hydropower projects may also result in an increased demand for construction machinery.

According to China Construction Machinery Business Online, investment in the construction of energy projects, particularly renewable energy projects, is projected to exceed RMB2,000 billion during the period from 2006 to 2020. China is also expected to increase the total capacity of its existing nuclear power plants from 9.1 million kW to 60.0 million kW by 2020, representing an increase of 559.0%. These factors are expected to further increase the demand for construction machinery.

Urbanization

Urbanization, or the average rate of change in the size of the urban population over a given of time, in China is another key driver for the continuous growth of the construction machinery industry. According to the National Bureau of Statistics of China, the urbanization rate in China increased from 36.2% in 2000 to [49.8]% in 2010.
The urbanization rate in China is 20-30 percentage points lower than that of developed countries. According to China Construction Machinery Business Online, it is projected that the urbanization rate in China will increase to 60% by 2020. At these projections and assuming China’s population of approximately 1.3 billion people, approximately 169 million people are expected to migrate to cities by 2020. In addition, it is estimated that a 1% increase in urbanization will require an investment of RMB6,600 billion, according to China Construction Machinery Business Online. The following chart illustrates the urbanization rate in China from 2000 to 2010 and the expected urbanization target rate in 2020.

Since 2008, the State Council of the PRC has approved a number of regional planning initiatives affecting 19 key metropolitan areas in central, western and northeastern China. Under these initiatives the PRC Government plans to commit resources to fund infrastructure projects, including developing highways, high-speed railways, ports, airports and other transportation initiatives as well as investing in the development of energy resources to expand these key metropolitan areas to be on par with Beijing, Shanghai and Guangzhou. These plans to stimulate the economy are expected to generate continued demand for advanced construction machinery in China. The 19 key metropolitan areas are set forth in the table below.

<table>
<thead>
<tr>
<th>Metropolitan Area</th>
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<tbody>
<tr>
<td>Western Coast of the Taiwan Strait Economic Zone</td>
</tr>
<tr>
<td>Hengqin Island Development Plan</td>
</tr>
<tr>
<td>Guanzhong - Tianshui Economic Zone</td>
</tr>
<tr>
<td>Development Plan for Coastal Areas in Liaoning Province</td>
</tr>
<tr>
<td>Development Plan for Coastal Areas in Jiangsu Province</td>
</tr>
<tr>
<td>Tumen River Area Cooperation Development Plan</td>
</tr>
<tr>
<td>Central China District Advancement Plan</td>
</tr>
<tr>
<td>Yellow River Delta Efficient Ecological Economic Zone</td>
</tr>
<tr>
<td>Poyang Lake Ecological Economic Zone</td>
</tr>
<tr>
<td>Gansu Province Recycling Economy Master Plan</td>
</tr>
<tr>
<td>Hainan International Travel Island</td>
</tr>
<tr>
<td>Industrial Cooperation Model District for the Metropolitan Area along Changjiang River in Anhui Province</td>
</tr>
</tbody>
</table>

Source: National Bureau of Statistics of China
In addition, the PRC Government has also decided to increase development in the Xinjiang region. The regional planning initiatives for the Xinjiang Regional Economic Zone is expected to be published in the near future.

**Increased Mechanization in the Construction Machinery Industry**

Recent developments in the construction machinery industry combined with changing social trends in China have resulted in increased mechanization in the industry and industrial upgrades. For example, construction machinery manufacturers are increasingly providing solutions that meet growing customer demand for energy conservation and emissions reduction. Specifically, the PRC Government has prohibited traditional concrete batching practices at construction sites to reduce pollution, thereby leading to increased demand for mechanized solutions that provide pre-mixed concrete, such as concrete batching plants and concrete mixers. See “— Analysis of Construction Machinery Segments — Concrete Machinery — Overview.” In addition, an increase in large energy infrastructure project investment by the PRC Government in recent years has resulted in an increase in the demand for the upgrade and manufacture of larger, more efficient construction machinery. See “— Investment in Infrastructure Industry.” Another factor resulting in the industrial upgrade of construction machinery is the general development and advancement of technologies used in the manufacture of construction machinery. As a result of the above factors, the increasing mechanization trend in the construction machinery industry provides an opportunity for corresponding growth in demand for construction machinery products.

**Government Policies Facilitating the Growth of China’s Construction Machinery Industry**

Since 2008, China has announced a series of policies to promote the development of the construction machinery industry. The following policies may facilitate the growth of the construction machinery industry in China:

- In January 2009, the Ministry of Commerce required that second-hand imported excavators meet its “imported second-hand excavator inspection criteria,” which included, among other things, a product life of not more than five years and a warranty period of not less than three months, or 500 hours.
- In May 2009, the State Council announced the 2009 - 2011 Outline for the Development of Construction Machinery Industry, which promotes the development of certain large-scale construction machinery to meet domestic demand, including the following: (1) hydraulic excavators with the capacity to dig and move over 32 tonnes and motor graders with power of over 206 kW; (2) truck cranes with the capacity to lift over 50 tonnes, all-terrain truck
cranes with the capacity to lift over 160 tonnes and crawler cranes with the capacity to lift over 200 tonnes; and (3) large-scale full set concrete machinery including truck-mounted concrete pumps, trailer-mounted concrete pumps and concrete batching plants.

- In April 2010, the PRC Government issued the Notice Regarding the Adjustment of the Import Tariff on Important Technology and Equipment. This policy provides, in applicable part, that the VAT on certain imported spare parts and components used to manufacture technologically advanced products, such as trailer-mounted concrete pumps, truck-mounted concrete pumps, graders and rotary drilling rigs, be exempted from VAT. This policy has been beneficial to companies like Sany, which uses such imported spare parts and components. Companies that use these VAT exempt imported spare parts and components will consequently reduce their production costs.

In addition to the above rules and regulations that are relevant to the PRC construction machinery industry in China, the Ministry of Commerce has indicated its broad support of overseas investment efforts by PRC companies. Under the “Guiding Opinions of the Ministry of Commerce on the National Work of Overseas Investment and Cooperation for 2010” (the “Guiding Opinion”), the Ministry of Commerce established a guideline of attaining US$46 billion of overseas direct investment by PRC companies that are not engaged in the finance industry for 2010. The Ministry of Commerce and its local branches have planned to take supportive measures to, among other things, strengthen the policy making, improve the services, enhance the training, improve external propaganda work, enhance overseas safety protection and standardize the overseas operational actions. The Guiding Opinion has provided support to PRC companies that were executing overseas expansion plans.

**Competitive Landscape**

Domestic construction machinery makers have become more competitive in the Chinese market in recent years. Aside from excavators, Chinese companies hold a sizeable market share in all major segments of construction machinery, including concrete pumps, cranes and wheel loaders. In some segments, like concrete pumps, Chinese companies had a market share of approximately 93.4% in China in 2010.

**Trade**

The import and export trade revenue for construction machinery in China has steadily increased since 2002, until the recent economic downturn since the latter half of 2008. However, as a result of the recent gradual economic recovery, import and export trade revenue increased recently in 2010. The import and export trade revenue of construction machinery has increased overall by a CAGR 19.3% and 38.9%, respectively, from 2002 to 2010.

From 2002 to 2008, the import trade revenue increased by a CAGR of 19.7% before decreasing by 14.5% from 2008 to 2009 due to the global economic downturn, and recently experienced an upturn from 2009 to 2010, when the import trade revenue increased by 63.1%, due to the upturn in the global economy. From 2002 to 2010, according to China Construction Machinery Business Online, import trade volume has generally decreased compared to export trade volume, largely due to technological advancements and improvements in construction machinery manufactured in China. As the quality of construction machinery manufactured in China has improved, customers in China are increasingly purchasing products from domestic Chinese manufacturers, thus decreasing their reliance on construction machinery imports. The overall growth in imports of construction machinery to China from 2002 to 2010 was primarily due to imports of spare parts and excavators, as well as large bulldozers, motor graders, asphalt pavers, truck cranes, stowing machine, forklift trucks and pneumatic tools.
Exports of construction machinery increased by a CAGR of 61.8% from 2002 to 2008, followed by a decrease from 2008 to 2009 of 42.5%, primarily due to decreased global demand as a result of the global economic downturn. However, due to the gradual recovery of the global economy, export trade revenue of construction machinery experienced an increase of 34.1% from 2009 to 2010. The overall growth in exports in recent years is a result of strong demand from emerging nations in Asia, the Middle East, Africa and South America.

The following chart illustrates the import and export trade volume of Chinese construction machinery industry for the periods indicated below.

**Import and Export Trade Volume of Chinese Construction Machinery Industry, 2002 to 2010**

Source: China Customs

**ANALYSIS OF CONSTRUCTION MACHINERY SEGMENTS**

**Concrete Machinery**

*Overview*

Concrete machinery is used in many different construction projects, including the construction of residential and office buildings, bridges, tunnels, and power plants. Concrete machinery primarily consists of truck-mounted concrete pumps, trailer-mounted concrete pumps, concrete batching plants, truck mixers and placing booms.

China is the largest manufacturer of cement in the world. China produced more than 1.63 billion tonnes, or 50.0% of total global cement production, in 2009. The demand for concrete machinery is also affected by PRC governmental policies relating to the construction industry. In 2004, the PRC Government required contractors to eliminate the traditional practice of batching concrete on construction sites in large and medium-sized cities, which led to significant demand for concrete batching plants, followed by increased demand for other concrete machinery such as concrete mixers, trailer-mounted concrete pumps and truck-mounted concrete pumps. In July 2009, the PRC Government has required contractors to completely eliminate the traditional practice of batching concrete at construction sites in all cities, resulting in increased demand for these products.

According to Chinese Construction Machinery Business Online, concrete machinery sales totaled RMB90.0 billion in China for the year ended December 31, 2010, an increase of 64.2% from the year ended December 31, 2009.
The following chart illustrates the sales revenue of concrete machinery produced in China by both domestic and international manufacturers for the periods indicated below.

### Sales Revenue of Concrete Machinery\(^{(1)}\) in China, 2005 to 2010

\[
\begin{array}{ccccccc}
\text{RMB Billions} & 15.0 & 22.0 & 31.6 & 43.8 & 54.8 & 90.0 \\
\end{array}
\]

**Source:** China Construction Machinery Business Online

\(^{(1)}\) Includes trailer-mounted concrete pumps, truck-mounted concrete pumps, truck-mounted stationary concrete pumps, concrete batching plants and concrete mixers.

The average selling price of truck-mounted concrete pumps is generally higher than other concrete machinery. Truck-mounted concrete pumps can be used for a broad range of applications. The primary function of truck-mounted concrete pumps is to pour concrete mix into the foundation of construction projects. They are also commonly used in large construction projects that require a large amount of cement casting, such as railways, highways, subways, hydro power stations, metallurgical construction and urban property developments.

Trailer-mounted pumps are generally used for smaller projects or projects which require long pumping distance or height capabilities. Liquid concrete is pumped at a certain level of pressure with the trailer-mounted concrete pump and then placed at a work site through additional steel or rubber placing booms. The booms are manually attached to the trailers and can be positioned wherever liquid concrete is needed. Trailer-mounted concrete pumps are fitted with [pipes], which allow them to send concrete to areas that are difficult to access, particularly due to high altitude.
**Competitive Landscape**

China’s truck-mounted concrete pump segment is highly concentrated, with Sany and Changsha Zoomlion Heavy Industry Science and Technology Development Co., Ltd. (“Zoomlion”) sharing over 93.3% of the market in 2010, each with a market share of 55.7% and 37.6%, respectively. China’s trailer-mounted concrete pump segment, together with truck-mounted stationary concrete pump segment, is also highly concentrated, with Sany and Zoomlion accounting for 79.2% of the market in 2010, each with a market share of 43.8% and 35.4%, respectively.

The following charts illustrate the market share of truck-mounted concrete pump and trailer-mounted concrete pump manufacturers in China in 2010 based on sales volume.

**Market Share of Truck-mounted Concrete Pump Manufacturers in China, 2010**

![Pie chart showing market share of truck-mounted concrete pump manufacturers in China, 2010.](Image)

*Source: China Construction Machinery Business Online*

**Market Share of Trailer-mounted Concrete Pump Manufacturers(1) in China, 2010**

![Pie chart showing market share of trailer-mounted concrete pump manufacturers in China, 2010.](Image)

*Source: China Construction Machinery Business Online*

*(1) Market Share includes sales of truck-mounted stationary concrete pumps.*
Excavators

Overview

Excavators are highly versatile. They are primarily used in earth moving applications such as foundation building and trench digging. By attaching different tools, however, excavators can be transformed for other uses including hoisting, pile driving, ramming, casting, assembly, crushing and demolition. They can also be used to lift heavy materials and objects when cranes are not available. Excavators are available in several designs, the most popular being hydraulic excavators.

China is both the largest manufacturer and the largest consumer of excavators in the world with sales revenue of RMB80.0 billion in 2010. In recent years, as the technology used in the manufacture of domestic excavators has improved, excavators made in China have developed rapidly. Market share of Chinese excavators is continuously increasing, resulting in the rapid rise of domestic excavator manufacturers such as Sany, Guangxi Liugong Machinery Co., Ltd. (“Liugong”), and Lonking Holdings Limited (“Lonking”).

The demand for excavators in China has outpaced supply in China since 1999. China’s excavator industry has not been able to meet market demand because of China’s rapid development and large scale infrastructure projects. According to China Construction Machinery Business Online, the supply shortage is expected to continue.

The following chart illustrates the domestic sales revenue for excavators for the periods indicated below.

Sales Revenue of Excavators in China, 2005 to 2010

(RMB Billions)

Source: China Construction Machinery Business Online

Excavators are used in a variety of industries, including infrastructure, road construction, surface mining, railway construction and power plant construction.
The following chart illustrates the domestic sales volume of excavators by industry in 2010.

**Sales Volume of Excavators by End Market in China, 2010**

- Highway and Roadway: 18.7%
- Municipal Construction (including real estate): 28.9%
- Mining: 18.4%
- Railway: 15.0%
- Water and Hydropower: 10.0%
- Other: 9.0%

Source: China Construction Machinery Business Online

**Competitive Landscape**

The excavator market is the most fragmented and competitive segment of the construction machinery industry in China. Since the 1990s, China’s excavator industry has been dominated by foreign companies, in particular Korean and Japanese companies such as Doosan, Komatsu, Hitachi and Hyundai Heavy Industry. In recent years, however, a number of domestic brands have entered the excavator market and have gained market share due to the improved technology and performance of domestically produced excavators. There are more than 30 excavator manufacturers in China with the top five manufacturers holding a market share of 58.8% in 2010. In 2010, Sany held a 7.4% share of excavator market based on sales volume, the highest among domestic manufacturers.
The following chart illustrates the market share of excavators by manufacturer in China based on sales volume in 2010.

**Market Share of Top Excavator Manufacturers in China, 2010**

- Komatsu 14.7%
- Doosan 13.1%
- Volvo 4.7%
- Caterpillar 6.4%
- Sany 7.4%
- Hyundai Heavy Industry 10.9%
- Kobelco 9.2%
- Other 22.7%

**Source:** *China Construction Machinery Business Online*

As the market for excavators continues to grow, domestic manufacturers of excavators have become increasingly competitive. For the four months ended April 30, 2011, the leading excavator manufacturers in China based on sales volume were Komatsu with 12.8%, Sany with 11.3%, Hyundai Heavy Industry with 11.0%, Doosan with 10.4% and Hitachi with 9.5% of the market according to China Construction Machinery Business Online.

The domestic market share held by foreign companies has decreased from 86.1% in 2005 to 72.1% in 2010 according to China Construction Machinery Business Online. The following chart illustrates the market share of foreign and joint venture manufacturers as well as domestic manufacturers in China’s excavator industry.

**Market Share of Foreign and Joint Venture Manufacturers and Domestic Manufacturers, 2005 to 2010**

**Source:** *China Construction Machinery Business Online*
Hoisting Machinery

Overview

Hoisting machinery consists of stationary cranes and mobile cranes that are used to lift and position large objects. By attaching clamshells, dragline buckets and magnets, cranes can be also used to move earth and maneuver and handle materials. Unlike stationary cranes whose main structures do not move when in use, mobile cranes are mounted on a mobile platform. Mobile cranes include crawler cranes and wheeled cranes. Truck cranes, trailer cranes, all-terrain cranes, rough terrain cranes and industrial hydraulic yard cranes are different types of wheeled cranes.

Truck cranes are widely used in real estate and infrastructure construction, including the building of railways and highways.

Crawler cranes are used in large-scale operations in industries such as the metallurgy, oil and chemical industries, as well as in the construction of nuclear and wind power plants. Compared to the overseas market, crawler cranes in China still represent a small percentage of the mobile crane market share. An increase in planned projects to build nuclear and wind power plants, however, may lead to an increase in the use of crawler cranes in China.

The following chart illustrates the sales volume of mobile cranes produced in China for the periods indicated below.

Sales Volume of Mobile Cranes in China, 2005 to 2010

![Bar chart showing sales volume of mobile cranes in China from 2005 to 2010]

Source: China Construction Machinery Business Online
In 2010, a total of 43,659 units of mobile cranes produced in China were sold in China. Sales of truck cranes represented a majority, or 81.2%, of all mobile cranes sold in China in 2010. Other types of mobile cranes sold in 2010 included 6,380 units of trailer-mounted cranes, 1,708 units of crawler cranes and 148 units of tire cranes. The chart below illustrates the market share of sales volume of mobile cranes produced in China by crane type in 2010.

Sales Volume of Mobile Cranes in China by Crane Type, 2010

Truck Cranes 81.2%
Crawler Cranes 3.9%
Trailer-mounted Cranes 14.6%
Tire Cranes 0.3%

Source: China Construction Machinery Business Online

Competitive Landscape

China’s crawler crane market is dominated by Chinese manufacturers with Sany, FuWa Heavy Industry Machinery Co., Ltd (“FuWa”) and XCMG Construction Machinery Co., Ltd. (“XCMG”) sharing approximately 77.0% of the market in 2010. According to China Construction Machinery Business Online, Sany was the largest crawler crane manufacturer in China based on sales volume in 2010. The following chart illustrates the market share of crawler crane manufacturers in China in 2010 based on sales volume.

Market Share of Top Crawler Crane Manufacturers in China, 2010

Sany 27.8%
FuWa 25.9%
XCMG 23.3%
Zoomlion 14.3%
Other 8.7%

Source: China Construction Machinery Business Online
China’s truck crane market is highly concentrated, with XCMG and Zoomlion and Sany sharing over 84.3% of the market in 2010. According to China Construction Machinery Business Online, Sany was the third largest truck crane manufacturer in China based on sales volume in 2010. The following chart illustrates the market share of truck crane manufacturers in China in 2010 based on sales volume.

**Market Share of Top Truck Crane Manufacturers in China, 2010**

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>XCMG</td>
<td>51.2%</td>
</tr>
<tr>
<td>Zoomlion</td>
<td>25.2%</td>
</tr>
<tr>
<td>Anhui Liugong</td>
<td>6.2%</td>
</tr>
<tr>
<td>Sany</td>
<td>7.9%</td>
</tr>
<tr>
<td>Other</td>
<td>9.5%</td>
</tr>
</tbody>
</table>

Source: China Construction Machinery Business Online

(1) Anhui Liugong Crane Co., Ltd (“Anhui Liugong”).

**Pile Driving Machinery**

**Overview**

Pile driving machinery consists of rotary drilling rigs, multi-function electro-hydraulic track piles, hydraulic diaphragm wall grabs, horizontal directional drilling rigs, down-the-hole drilling rigs and pile-top air-lift reverse circulation drilling rigs. Pile driving machinery drill holes, boreholes, and shafts in the ground. Rotary drilling rigs offer high-power, highly efficient yet flexible and environmentally friendly drilling capability. In China, drilling rigs are used in infrastructure projects such as railways, subways, large buildings and airports.

Sales revenue of rotary drilling rigs accounted for less than 37% of the pile driving machinery industry in 2005, but has increased significantly since then and accounted for over 75% of the pile driving machinery industry in 2010. In 2010, sales revenue of rotary drilling rigs was approximately RMB4.5 billion, an increase of 12.5% from 2009.

There are high barriers to entry in the rotary drilling rig industry. New market entrants must have sufficient capital, technical expertise and experienced and knowledgeable management in the pile driving machinery industry to compete with established manufacturing companies.
The following chart illustrates the sales volume of pile driving machinery produced in
China by both domestic and international manufacturers for the periods indicated below.

**Sales Volume of Pile Driving Machinery in China, 2005 to 2010**

![Graph showing sales volume](image)

*Source: China Construction Machinery Business Online*

The following chart illustrates the sales volume of rotary drilling rigs produced in China by both
domestic and international manufacturers for the periods indicated below.

**Sales Volume of Rotary Drilling Rigs in China, 2005 to 2010**

![Graph showing sales volume](image)

*Source: China Construction Machinery Business Online*
Competitive Landscape

China’s rotary drilling rig market is dominated by Chinese manufacturers. For 2010, Sany, Zoomlion, Hunan Sunward Intelligent Machinery Co., Ltd (“Sunward”) and Yutong Heavy Industries Co., Ltd (“Yutong”) cumulatively held 69.6% of the market share. Sany was the leader in market share for rotary drilling rigs with a market share of 39.2% for 2010.

The following chart illustrates the market share of rotary drilling rig manufacturers in China for 2010 based on sales volume.

![Market Share of Top Rotary Drilling Rig Manufacturers in China, 2010]

Source: China Construction Machinery Business Online

Road Machinery

Overview

Road machinery, including graders, rollers, pavers and millers, are used principally in the construction of roads, bridges, parking structures and other paved surfaces. Concrete pavers are also used in canal and water engineering.

At the end of 2010, China’s expansive network of roadways extended to more than 4.0 million kilometers, including more than 74,100 kilometers of high-speed highways. The PRC Government’s total investment in motorway construction was approximately RMB1,148 billion in 2010.

According to China Construction Machinery Business Online, the PRC Government plans to invest more than RMB800 billion each year in total motorway construction throughout China from [2010 to 2013] and also plans to construct an average of 3,490 kilometers of new highways per year until 2020. Specifically, the average annual investment in highway construction is expected to be approximately RMB500 billion each year from 2010 to 2015. By 2020, China is expected to have more than 100,000 kilometers of highways. In addition, the demand for road machinery, particularly rollers and pavers, is expected to grow as a result of this increase in new road construction fueled by China’s increase in urbanization.
The following chart illustrates the sales volume of road machinery produced in China by both domestic and international manufacturers for the periods indicated below.

Sales Volume of Road Machinery (Excluding Graders) in China, 2005 to 2010

![Sales Volume Chart]

*Source: China Construction Machinery Business Online*

**Competitive Landscape**

A substantial portion of road machinery sales in China consist of asphalt rollers and asphalt pavers according to China Construction Machinery Business Online. Within the asphalt roller market in China, XCMG, Liugong and Luoyang Lutong Heavy Industry Machinery Co. Ltd. (“Lutong”) were the top manufacturers in 2010. The following chart illustrates the market share of asphalt roller manufacturers in China based on sales volume in 2010.

Market Share of Top Asphalt Roller Manufacturers in China, 2010

![Market Share Chart]

*Source: China Construction Machinery Business Online*

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(1) Shantui Construction Machinery Co., Ltd (“Shantui”).
(2) Xiamen XGMA Machinery Co., Ltd. (“XGMA”).
(3) YTO Group Corporation (“YTO”).
(4) Changlin Company Limited (“Changlin”).
The following chart illustrates the market share of asphalt paver manufacturers in China based on sales volume in 2010.

Market Share of Top Asphalt Paver\(^{(1)}\) Manufacturers in China, 2010

![Market Share Chart]

Source: China Construction Machinery Business Online

\(^{(1)}\) Includes asphalt pavers [with a minimum paving width of six meters in length]

\(^{(2)}\) Wirtgen (China) Machinery Co., Ltd. (“Wirtgen”)

\(^{(3)}\) Jiangsu Huatong Kinetics Co., Ltd. (“Huatong”)

INFORMATION SOURCES

Yantai Jie Rui Network and Trading Co., Ltd. (China Construction Machinery Business Online)

We commissioned Yantai Jie Rui Network and Trading Co., Ltd. to analyze data from its proprietary database, China Construction Machinery Business Online, to conduct a market survey of the construction machinery market in China. China Construction Machinery Business Online is one of the leading electronic commerce service providers and information solution providers for the PRC construction machinery industry. We were charged a total of RMB[104,000] for services provided by Yantai Jie Rui Network and Trading Co., Ltd. The amount of fees payable to Yantai Jie Rui Network and Trading Co., Ltd. is not contingent on our approval of its work.

Yengst Associates

We commissioned Yengst Associates to prepare an overview of the global construction machinery industry. Yengst Associates has over 30 years of experience providing market research services in the machinery industry. In addition to providing publications, reports and data subscription services relating to machinery industry data, Yengst Associates also offers consulting services and private research studies to equipment manufacturers and financial institutions on a global basis. We were charged a total of [US$65,000] for services provided by Yengst Associates. The amount of fees payable to Yengst Associates is not contingent on our approval of its work.