

<u>CONTENTS</u>	<u>PAGE</u>
<u>A REVIEW OF 2007 AND A FORECAST TO 2012</u>	1
SUMMARY	2
ECONOMIC BACKGROUND	4
CONSTRUCTION AND MINING ACTIVITY	5
<u>EQUIPMENT ANALYSES</u>	
• ASPHALT FINISHERS	11
• BACKHOE LOADERS	12
• COMPACTION EQUIPMENT	12
• CRAWLER DOZERS	14
• CRAWLER EXCAVATORS	14
• CRAWLER LOADERS	15
• DUMP TRUCKS	16
• MINI EXCAVATORS	17
• MOBILE CRANES	17
• MOTOR GRADERS	19
• SKID-STEER LOADERS	20
• TELESCOPIC HANDLERS	20
• WHEELED EXCAVATORS	20
• WHEELED LOADERS	21
<u>EXPORTS</u>	23
<u>INTERNATIONAL PERSPECTIVES</u>	25
DEERE PURCHASES XCG, A CHINESE MANUFACTURER OF HYDRAULIC EXCAVATORS	28

A REVIEW OF 2007 AND A FORECAST TO 2012

Table 1. China: Sales of Construction Equipment, by Type, 2003-2007

(Units)

	2003	2004	2005	2006	2007	% Change 2006-2007
Articulated Dump Trucks	10	3	20	68	91	+34
Asphalt Finishers	1,493	1,512	966	1,081	1,027	-5
Backhoe Loaders	347	364	352	295	583	+98
Compaction Equipment	13,957	12,243	8,083	8,488	7,509	-12
Crawler Dozers	7,427	5,832	4,580	4,968	5,273	+6
Crawler Excavators	31,393	26,050	23,180	33,685	49,167	+46
Crawler Loaders	11	10	10	10	10	-
Mini Excavators	3,185	3,730	7,500	11,939	16,850	+41
Mobile Cranes	9,976	12,021	10,951	14,060	18,250	+30
Motor Graders	1,630	1,648	1,224	1,515	1,766	+17
Motor Scrapers	20	3	3	2	2	-
Rigid Dump Trucks	417	464	476	505	687	+36
Skid-Steer Loaders	103	127	225	206	250	+21
Telescopic Handlers	9	15	16	20	20	-
Wheeled Excavators	829	554	600	547	806	+47
Wheeled Loaders	83,200	102,660	109,100	125,300	149,730	+19
Total Construction Equipment	154,007	167,236	167,286	202,689	252,021	+24
% Annual Change	+58	+9	-	+21	+24	+24

Source: Off-Highway Research

Table 2. China: Forecast Sales of Construction Equipment, by Type, 2008-2012

(Units)

	2008	2009	2010	2011	2012	% Change 2008-2012
Articulated Dump Trucks	100	90	90	100	110	+10
Asphalt Finishers	1,100	1,300	1,350	1,200	1,250	+14
Backhoe Loaders	800	1,000	1,200	1,400	1,600	+100
Compaction Equipment	7,300	7,000	7,000	7,500	8,000	+10
Crawler Dozers	5,400	5,200	5,000	5,200	5,500	+2
Crawler Excavators	60,000	54,000	56,000	58,000	60,000	-
Crawler Loaders	10	10	10	10	10	-
Mini Excavators	22,000	25,000	28,000	31,000	35,000	+59
Mobile Cranes	19,000	17,500	15,500	15,000	16,000	-16
Motor Graders	1,850	1,800	1,700	1,700	1,800	-3
Motor Scrapers	3	2	2	2	3	-
Rigid Dump Trucks	750	800	800	780	750	-
Skid-Steer Loaders	300	350	500	700	900	+200
Telescopic Handlers	20	25	30	40	50	+150
Wheeled Excavators	1,000	1,200	1,300	1,400	1,500	+50
Wheeled Loaders	165,000	175,000	170,000	180,000	190,000	+15
Total Construction Equipment	284,633	290,277	288,482	304,032	322,473	+13
% Annual Change	+13	+2	-1	+5	+6	+13

Source: Off-Highway Research

SUMMARY

The Market in 2007

Buoyant growth has returned to the construction equipment market in China since 2006. In 2007, the total sales grew further by 24 per cent, totalling 252,021 units. Although government policy has focussed on controlling investment activities, the market was driven to new record sales volumes by the large number of new projects begun in 2007 as part of the 11th Five-year Plan (2006-2010).

Since 2006 the government has begun a new round of economic regulation to address concerns about an overheated economy, although the impact of these measures is unclear. While concerned about overheating, the government did not want to act as a brake on economic growth and opted for only moderate regulatory measures. Rather than total growth, the focus was on improving the structure of the economy. Infrastructure development was given consistent support: housing projects were encouraged to help improve living standards, while mining and quarrying activities continued to thrive to support construction and industrial production. Not every region grew equally. Construction activities boosted the central and western provinces as a result of the government's desire to help them catch up with more developed eastern areas. The abundant supply of finance enhanced the confidence of buyers and also increased their purchasing power.

The health of the construction equipment industry market also improved, as reflected by the growing role of international suppliers and the trend towards industry consolidation. International manufacturers increased their investment and underlined their long-term commitment to this fast growing market, notably by making considerable efforts to support local customers. The major Chinese manufacturers, on the other hand, began to give more emphasis to operating income and improving their financial position. The competitiveness of these domestic companies was further improved through consolidation and was demonstrated by surging exports.

The Winners: Most product sectors witnessed growth. The **crawler excavator** market doubled compared to only two years ago. **Wheeled loaders** continued to grow rapidly and set a new record for sales; their share of the total market reduced slightly, however, to 59 per cent, with even faster growth in other product types. **Crawler dozers** sales grew by six per cent while **dump trucks**, both articulated and rigid, recorded their highest sales for 10 years, mainly due to strong demand from the mining industry.

In compact equipment, while **mini excavators** continued to lead the way with a widely anticipated surge of 41 per cent, **backhoe loaders** and **skid-steer loaders** also showed signs of becoming more popular. Sales of **compact loaders**, which were combined into the statistics of **wheeled loaders**, carried on growing. **Telescopic handlers** remained a niche product and most local production was exported.

The Losers: With the slowdown in road investment and the reduced number of new road projects begun last year, **compaction equipment** and **asphalt finishers** were bound to suffer. However, even though the market for new asphalt finishers dropped five per cent, demand in the paving market is still reasonably strong.

Outlook to 2012

Following two years of growth, the market is forecast to continue to expand in 2008, and then tend to become flat by 2010; thereafter demand is expected to increase again at the beginning of a new economic cycle. In general terms, market growth will be moderate in the next five years, given the large existing population of machines and the intention of the authorities to regulate the entire economy more strongly.

Most of the major projects launched in the previous year will continue in 2008, including the Beijing-Shanghai High Speed Railway, the second West-to-East Gas Transmission pipeline, and the South-to-North Water Diversion, which will help to stimulate the market. The serious impact on the transport and power networks of the heavy snow at the beginning of 2008 also served as a reminder of the need for improvements to infrastructure.

The economy is now entering a critical period. Consecutive years of rapid expansion have brought it to the verge of overheating, if it is not overheated already. At the same time, the slowdown of the global economy may reduce export opportunities. The prevailing wisdom is that growth will be sustained, and that domestic demand should be encouraged to support the national economy. Meanwhile, the consumption of natural resources is set to become more closely controlled in a bid to mitigate the impact on the environment. Substantial construction investment is anticipated to continue for the next 10-15 years, in an attempt to keep pace with the process of industrialisation and urbanisation and also to ensure balanced development across the country. The Olympic Games were also a positive incentive to the construction equipment market, although it will not necessarily suffer a decline once the Games have finished as new demand will be generated by other projects, i.e. the West-to-East Gas Transmission Pipeline, which is of a similar scale in terms of investment but covers a much wider area.

The main reason for anticipating a slowdown in the rate of expansion of the market is the rapid increase in the total machine population. Following the fast growth in sales over the last two years, the total number of active machines was estimated to be in the region of 1.4-1.5 million units at the end of 2007, about half as much again as the volume of only two years ago. In other words, about 30 per cent of existing machines were purchased in the past two years. This large population of machines, in particular hydraulic excavators and wheeled loaders, will act as a deterrent to sales of new machines should demand from construction be curbed. Therefore, on the assumption that the government continues to tighten the money supply and regulate investment activities, the domestic demand for construction equipment may flatten, although it will remain at a very high level.

ECONOMIC TRENDS

Table 3. China: Key Economic Indicators, 2003-2007
(Annual % Change)

	2003	2004	2005	2006	2007
Real GDP Growth	10.0	10.1	10.4	11.1	11.4
Industrial Output	12.8	11.5	11.6	12.9	13.5
Construction Output	12.1	8.1	12.6	13.7	12.6
Gross Fixed Investment	27.7	26.6	26.0	23.9	24.8
Exports	34.6	35.4	28.4	27.2	25.7
Imports	39.9	36.0	17.6	20.0	20.8
Consumer Price Index	1.2	3.9	1.8	1.5	4.8

Source: National Bureau of Statistics (NBS)

Although at the beginning of 2007 most economists forecast a slowdown in GDP growth rates, in the event it accelerated to 11.4 per cent, the fastest rate of growth since 1995. This extraordinarily high rate of growth has once again put the Chinese economy in danger of overheating, as reflected by the significant escalation of the Consumer Price Index (CPI). Industrial output remained the most important contributor to GDP growth, recording an increase of 13.5 per cent while construction output remained very high. The expansion of domestic consumption saw acceleration in investment growth, and accounted for the greatest portion of economic growth among the three major driving factors of consumption, investment and exports.

Fixed investment grew by 24.8 per cent and amounted to RMB13,723.9 billion, or 55.6 per cent of total GDP. This has been accompanied by resumption of major new projects, from a negative growth rate at the beginning of the year to 28.7 per cent increase for the 12 months ending December 2007.

Foreign trade, which continued its huge growth, was characterised by a slowdown in export growth but greater imports. The strengthening of the RMB/USD exchange rate might have contributed to this slow down, although it is believed that the government's efforts to restrict export growth, coupled with increased costs of production, played more important roles.

The rapid growth of the economy has led to a significant increase in the CPI, an unwelcome feature of the economy that is continuing in the first quarter of 2008, particularly in food prices. It has now become the top priority of the government to control inflation and maintain economic stability.

In the light of the downturn in export growth due to the slowdown of the global economy, and the concern about possible inflation, for which the central government in December 2007 announced the need to tighten money supply, economic growth is expected to have peaked in 2007 and there should be a reduced growth rate in 2008. In fact, growth appeared to have already slowed down in the fourth quarter of 2007. Economists forecast that the GDP growth rate may fall to around 10 per cent in 2008, while the CPI would continue to be in the region of four to six per cent. Policy makers are now faced with a dilemma: although a policy of fiscal tightening is necessary for controlling the risk of inflation and preventing the economy from overheating (if it is not already), the government does not want to see the economy stagnate due to excessive controls. With the huge production capacity that has built up over the recent years, any drop in demand would be an economic disaster. As a result, current policy is to attempt to regulate the structure of the economy without putting a brake on growth.

CONSTRUCTION AND MINING ACTIVITIES

In 2007, the second year of the current 11th Five Year Plan, construction and mining activity continued at a very high level, as reflected by the resumption in growth of total fixed investment. Although the central government has expressed serious concern about the overheating of the economy as a whole, the plans for construction expenditure at various administrative levels appear to be even more ambitious than before. In fact, the total investment in new projects launched in the 12 months ending December 2007 was 28.7 per cent higher than the same period in 2006, and has continued to accelerate since the fourth quarter of 2007. The increased demands from industry and construction, along with the continually growing aspirations of the people, have pushed the output of mining and quarrying to unprecedented levels.

Roads

Table 4. China: Investment in Road Construction, 2003-2007*

	2003	2004	2005	2006	2007*
RMB Bns	371	470	548	623	640
% Growth	+16	+27	+17	+14	+3

* Estimate

Source: Ministry of Communications

Road investment has continued to grow and has reached the highest level on record. However, as most major projects have relied heavily on bank loans, and many highway projects have seen financial returns after being opened as toll roads, the banks have become cautious in financing road projects. The road sector has therefore intentionally limited investment growth in a bid to reduce the future risk of bad debts. After continued growth over the last decade, road investment now appears to have stabilised at a level with which the sector can cope, given its existing resources.

Nevertheless, motivated by the policy to support the rural economy, investment in rural road improvement continued to grow by 13 per cent to RMB180 billion in 2007, and central government added further financial aid with revenues from the automobile purchase tax.

Table 5. China: Road System Development, 2003-2007

('000 Kilometres)

	2003	2004	2005	2006*	2007
Total Length	1,810	1,871	1,930	3,457	3,601
– Expressways	30	34	41	45	53

* In 2006 the length of village roads, totalling 1,532,000 kilometres, was included in the statistics for the first time.

Source: Ministry of Communications

In 2007 the nation's road network was extended by 143,595 kilometres and reached 3,600,595 kilometres. The expressway network was extended by 8,059 kilometres, and its total length had reached 53,360 kilometres by the end of the year. The main spines of the National Trunk Highway System, which totals about 35,000 kilometres, have now been completed, and a number of major bridges were finished during the course of the year. In the countryside, with the

support of government financing, 423,000 kilometres of rural roads were either built or upgraded, a 63 per cent growth over the length completed in 2006.

In the next few years, the construction of main highways will continue at a similar rate, with the new plans for the National Expressway Network being implemented. Road development in remote areas is now a central government priority, while in developed areas local governments are continuing to increase the road network with their own financial resources. Rural road improvement will continue to receive financial aid from central government. In addition, with increasing concerns about safety, around 6,000 suspect bridges across the country will be upgraded in the next three years. Therefore, road construction is anticipated to remain a very strong sector, and with the increase in road length and the need to upgrade the existing network, demand for road machinery will remain at very high levels.

Railways

Table 6. China: Capital Investment in Railway Construction, 2003-2008

	2003	2004	2005	2006	2007	2008*
RMB Bns	53.4	51.6	88.9	155.3	172.8	300
% Change	-14	-3	+72	+75	+11	+74

* Government Plan

Source: Ministry of Railways

Railway construction has accelerated since 2005, with 2007 seeing twice the level of investment compared with two years earlier. To raise the funds needed for speeding up the progress of railway development, the government has proposed to introduce non-state investments from a variety of sources.

In 2007 the railway network was extended by 1,156 kilometres, resulting in a nationwide network of 78,000 kilometres. In spite of this expansion, progress is thought to have lagged behind the original plan for the year. Nevertheless, there are now 5,600 kilometres under construction and another 4,100 kilometres, including the Beijing-Shanghai High Speed Railway which is to absorb a total investment of RMB220 billions, will be implemented in 2008.

Capital investment in railway construction is anticipated to rise to RMB300 billion in 2008, or 1.7 times the amount in 2007. According to the 11th Five-year Plan of the Ministry of Railways, in the period 2006-2010 a total of 17,000 kilometres of new lines will be constructed, consisting of 7,000 kilometres of passenger lines, and 8,000 kilometres that will be converted into double

tracks. Total investment is expected to be RMB1,250 billion, representing an unprecedented level of investment, with much of the funds being used for significant improvements in the speed of passenger lines. According to the latest plan, the total railway length is to reach 120,000 kilometres by 2020, in a bid to meet the rapidly growing demands of public transport and freight movement.

Water Conservancy

Table 7. China: Capital Investment in Water Conservancy, 2003-2010

(RMB Billions)

	2003	2004	2005	2006	2006-2010*
RMB Bns	74.3	78.4	74.7	79.4	462.8
% Change	-9	+6	-5	+6	

* Government plan.

Source: Ministry of Water Resources

Water conservancy projects represent another major source of demand for construction equipment, and this sector has received much greater investment over the last two years. The capital investment in water conservancy is co-funded between central and local governments, and in 2007 central investment increased by 14 per cent to over RMB34 billion.

The current priorities for these investments are to upgrade flood defences in the main rivers, and to ensure the water supply in the drier northern areas via the south-to-north water diversion projects. In the countryside, the government is continuing to give financial support to provide drinking water, and to improve the efficiency of irrigation systems. In western areas, where most of the main rivers originate, hydro-electric power facilities are to be further developed, with greater emphasis given to environmental protection.

Real Estate Development and Urban Construction

Table 8. China: Real Estate Development, 2003-2007

	2003	2004	2005	2006	2007
RMB Bns	1,010.6	1,315.8	1,591.3	1,938.2	2,528
% Change	+30	+28	+21	+22	+30

Source: National Bureau of Statistics

Real estate development, which has become a focus of economic regulation, registered a high rate of growth in 2007, and accounted for 18 per cent of total gross fixed investment. Housing projects made up over 70 per cent of total investment in real estate development. Due to concern about surging house prices and the excessive acquisition of farmland, priority is to be given to the supply of affordable housing projects to meet the needs of those on low incomes, while luxury developments are to be strictly controlled. Given the consistent trend of urbanisation, real estate development is expected to grow gradually over the mid to long term, for this also constitutes an important part of the policy for increasing domestic consumption.

Table 9. China: Key Statistics of Urban Utilities, 2002-2006

	Developed Area (Km²)	Length of Urban Roads ('000 Kms)	Area of Urban Roads (Mn m²)	Length of Gas Pipelines ('000 Kms)	Length of Sewer Pipelines ('000 Kms)
2002	25,973	191	2,770	114	173
2003	28,308	208	3,156	130	199
2004	30,406	223	3,530	148	219
2005	32,520	247	3,922	162	241
2006	33,660	241*	4,114*	189	261

* There was a change in the road statistical accounting in 2006.

Source: National Bureau of Statistics

The boom in real estate has been accompanied by the construction of urban infrastructure, including roads, bridges, water supply, sewage systems, telecom conduits and energy pipelines, as well the underground railways that are being developed in the central cities. Developed urban area expanded by 50 per cent from 2000 to 2006. With the strong trend towards urbanisation and the pursuit of better living conditions, there will be an increasing emphasis on the development of urban utilities in future. The unprecedented heavy snows that occurred in the southern provinces at the beginning of 2008 highlighted the need for improvement in the quality and disaster handling capabilities of these urban infrastructures.

Mining and Quarrying

Mining and quarrying activities have kept up a fast rate of growth over the last decade, as demand for energy and raw materials have continued to expand rapidly. However, the focus of the 11th Five-year Plan for the energy and raw material industries has shifted from an increase in production to the optimisation of the industrial structure, in a bid to protect natural resources and improve safety and productivity.

Table 10. China: Production of Coal, Iron Ore and Cement, 2003-2007

(Million Tonnes)

	2003	2004	2005	2006	2007
Coal	1,722	1,992	2,205	2,373	2,523
Iron Ore	253	310	420	580	710
Cement	862	967	1,069	1,237	1,380

Source: National Bureau of Statistics

Coal makes up the bulk of China's energy supplies, and the country is now both the largest consumer and largest producer in the world. Power generation and heating supply now consume 55-60 per cent of the domestic coal production and will continue to push the demand for coal mining. By 2007, coal production was double the volume achieved in 2000 and annual coal output is set to be in the region of 2,900-3,000 million tonnes by 2010. Nevertheless, as a result of the government's policy to consolidate the coal mining industry and make it more efficient, the major coalmines have struggled to increase their production capacity.

China now has the world's largest production capacity for iron and steel. Domestic iron ore mining activity has seen substantial growth in the last decade and is to be further intensified in a bid to minimise the impact of higher import prices. The production of iron ore has more than trebled since 2001, and this has led to much improved profits in the mining industry, largely as a result of the escalation of steel prices. The major iron ore mines are being encouraged to enhance their production efficiency, and to increase their role in supplying the iron and steel making sector.

China's cement production has been the largest in the world since 1985, and has been given great impetus by the booming construction market. In 2006 production increased markedly and in 2007 it grew by another 12 per cent. The continued growth of cement production and the consolidation of the industry have stimulated demand for large capacity equipment for limestone quarrying.

West-to-East Natural Gas Transmission

After the completion of the first pipeline, the construction of the second natural gas line which will deliver natural gas from Central Asia to Southeast China is to be started in 2008. The pipeline project comprises a 4,945 kilometre trunk line from Xinjiang to Guangzhou and eight branch lines totalling 3,849 kilometres. Total investment is expected to be in the region of

RMB150-200 billion. The facility is set to come into operation by 2010 and is expected to be another important driver in the demand for construction equipment.

EQUIPMENT ANALYSES

Asphalt Finishers: Following a recovery in 2006, the market was stagnant in 2007, with a slight drop of five per cent. There were fewer new road projects but existing work underpinned a basically strong demand for asphalt finishers.

The drop in the market took place in the **12-13 metre** class, which five years ago used to be the most important portion of the market but has now reduced to 15 per cent of domestic sales. A proportion of locally produced machines in this class were actually used for laying base course material rather than for surfacing. Preference has now shifted to **8-9.5 metre** machines, due partly to concerns about the undependable paving results of the largest machines and also to the rise in the demand for urban roads: 40 per cent of total sales are now accounted for by 9 metre machines. Sales of smaller machines – **4.5 to 7.5 metres** – continued the growth of the last three years, with paving works on secondary roads creating a consistent demand, along with road reconstruction and maintenance.

XCMG remained as the top supplier, with a 20 per cent market share, followed by **Zhenjiang Huatong**. The other two Chinese manufacturers, **DTCM** and **Chengdu Xinzhu**, saw sales stagnate. **Shaanxi Construction Machinery** focused on supplying machines to Volvo and gave up marketing its own products. There was a remarkable rise in sales by **Sany** and **Zoomlion**, each of which claimed over 10 per cent market share and had particular success in the more sophisticated paving market.

Nevertheless, European manufacturers continued to dominate the supply of high-spec asphalt finishers for major road projects. All three key manufacturers, **ABG**, **Wirtgen Vögele** and **Dynapac**, had a six per cent market share. ABG products now sell with the name of Volvo, the machines being built by Shaanxi Construction Machinery.

The future annual demand for asphalt finishers is anticipated to be in the region of 1,000-1,300 units. This demand will be maintained by major, on-going intercity road projects and is expected to last for another decade. Furthermore, urban road development and rural road improvement will create new demands. With such consistent markets, there will be a growing need to replace fleets while the increasing growth in the maintenance sector will create a demand

for machines around 6 metre working width, a sector that has already shown remarkable growth in 2007.

Backhoe Loaders: After an improvement in 2003, this market had been stagnant for four years until renewed growth in 2007. Total domestic sales in 2007 doubled to 583 units, although this is still a niche market compared to the soaring demand for mini excavators. Increased demand came from utility contractors while their traditional applications such as oilfields continued to be important destinations for backhoes.

The conventional perception of backhoe loaders in China is that an imported machine costs the same as a mini excavator and a medium-sized wheeled loader together. The extra cost of an extra operator to operate two machines is not significant, while it is difficult to find an operator who can use a backhoe effectively. The situation is changing, however. With an increasing number of manufacturers beginning to push backhoes in China, there is a growing awareness of the machine's capabilities. As a result, private contractors have begun to emulate buyers from the municipal sector and show an interest in backhoes.

Articulated backhoe loaders that used to account for half of the sales have seen their share of the market shrink to less than 30 per cent of the total market. The market is now dominated by more powerful, rigid chassis machines. **JCB**, in the first full year of operation of its Shanghai factory, led the way with a 19 per cent market share; **Case** followed with 14 per cent. Most of the major Chinese manufacturers already produce a backhoe or plan to do so. They have made considerable efforts to emulate leading designs, while some continued to exploit the market for cheaper, articulated machines. Among Chinese manufacturers, **XCMG Compact** remained the largest supplier. Other established suppliers include **Changlin**, **Chaogong** and **Yangong**, while **Lingong** and **Xiagong** have made good progress. **Foton Lovol** recorded considerable export sales.

It is still too early to anticipate a substantial surge in this niche market. With an increasing number of suppliers, the domestic market may increase to over 1,500 units in the next five years. However, the price of a backhoe loader will prevent it from making a significant impression on sales of the various types of machines used in its stead. There remains a long way to go in terms of educating the market and in increasing the number of competent operators who can really use the machine efficiently.

Compaction Equipment: The market in 2007 witnessed a drop of 12 per cent, with sales in the region of 7,500 units. Although at the beginning of the year the industry expected the market to

continue the growth seen in 2006, domestic demand had been held back due to the slower rate of road investment. After the huge volume of sales made in 2002-2004 a large population of new machines is still available for earth compaction works.

Sales of **static rollers** continued to fall to the region of 8-9 per cent of the total domestic market. **Self-propelled rollers**, which accounted for 60 per cent of the total market, also fell to below 4,600 units in 2007. Their popularity suffered not only due to the reduced number of new road projects, but also to the inability of existing, inefficient machines with mechanical drives to meet the increasingly sophisticated requirements and the demand for higher specifications.

On the other hand, demand for **tandem rollers** and **PTRs** remained buoyant. A large number of existing road projects reached the surfacing stage and there was considerable reconstruction of existing roads, both of old roads in urban areas and main highways. The maintenance sector continued to increase the demand for light compactors under four tonnes.

The increasing number of manufacturers in this industry has resulted in the erosion of the pre-eminence of the traditional market leader. **XCMG** remained the biggest producer but saw its market share fall to 25 per cent. **Yituo**, thanks to the integration of Lutong which had previously expanded rapidly through its competitive pricing policy, retained its market share of 20 per cent. Next came **Sanming** and **Liugong** which progressed well in both domestic sales and exports. **Sany** and **Zoomlion** continued to grow in the more sophisticated end of the paving market. Among new manufacturers, **Longgong** and **Shantui** struggled to increase market share while all Chinese manufacturers increased their export efforts, in a bid to offload excess capacity.

International suppliers continued their important role in the tandem roller sector, which has a tradition of using international brands to secure paving quality. They also progressed well in the light compactors sector used for maintenance purposes. In the earth compacting market, they targeted sales on the more sophisticated customers, like railway and dam builders, who have a greater appreciation of machine efficiency and reliability. **Bomag**, after opening its new factory in Shanghai, achieved a growth in domestic sales as well as healthy exports of light compactors. **Caterpillar** launched the production of tandem rollers in Xuzhou in 2006 and had a modest success in the market. **Volvo** closed the I-R plant in Wuxi and moved the production of compaction equipment to Lingong in Shandong. It will be some time before production with a new team can begin.

Although the demand for compaction equipment stagnated due to the slowdown in major new road projects, the market is not expected to return to the low level seen at the beginning of the

decade. The large quantity of intercity and urban roads will maintain a consistent demand for reconstruction and maintenance equipment, while new railways and other infrastructure projects will generate new demand. The market is forecast to remain in the region of 7,000-8,000 units, with a growing emphasis on more sophisticated products.

Crawler Dozers: Domestic demand grew at six per cent in 2007, to a total of 5,273 units. This was the second consecutive year of growth after a substantial fall in 2005. The market was driven by the growth in construction projects such as railways, roads and water conservancy, but also the booming activity levels in coal and other mines and oil field development.

The demand for small dozers below 120 horsepower remained dormant and now accounts for only 12 per cent of the total market. The 140 horsepower machines, which used to be the most popular size, witnessed a drop of 17 per cent. The majority of growth in the market came in larger models above 160 horsepower. The 160 horsepower sector itself became the most important market, accounting for 31 per cent of total sales. Substantial growth was also seen in the 220 and 320 horsepower classes.

Shantui further enhanced its market leadership with market share increasing to 44 per cent, while the second largest supplier, Xuanhua, saw its share fall to 20 per cent. **Tianjin Construction Machinery** maintained a market share of 11 per cent, and has recently been purchased by Liugong in a bid to expand its product range. **Yituo** continued its niche focus on small dozers under 110 horsepower. Both **Caterpillar** and **Komatsu** saw healthy sales increases, although their market shares in China were still modest. Caterpillar increased production in Xuzhou to 270 units, with half of its output being exported.

With such major infrastructure projects as the west-to-east gas transmission line and Beijing-Shanghai High Speed Railway being put into implementation, the demand for crawler dozers is anticipated to remain strong in 2008. It is anticipated that the market will be stable in the region of 5,000-5,500 units a year, with higher proportion of sales accounted for by more powerful and more sophisticated machines. In addition, export sales will remain buoyant.

Crawler Excavators: The demand for crawler excavators can only be described as surprising with sales of new machines in 2007 creating a historical high of almost 50,000 units, up 46 per cent on the previous year, beyond the expectations of all suppliers. In fact the total demand for crawler excavators in 2007 exceeded 70,000 units when imported, second hand machines are taken into account.

The dominating position of the **19-25 tonne** range continued to decline from its peak of 82 per cent in 2003, reducing from 67 per cent in 2006 to 62 per cent in 2007. This change indicates not only the maturing nature of the market but also reflects the diversification of demand. The growing number of mining and quarrying applications as well as small and medium projects is the major drivers for the increase in sales of other sizes.

Sales of midi machines in the **6-15 tonne** range reached almost 10,000 units, growing 70 per cent over the previous year and accounting for 20 per cent of the total market. This is attributable to the efforts of mini excavator suppliers such as Yuchai and Sunward to expand their product ranges as well as some new entrants including Foton Lovol and Dalian Blackcat. The larger machines **over 30 tonnes** operating weight, principally the 33 tonne class, accounted for 11 per cent of total demand with volume increasing to over 5,400 units, primarily sold to the northern and western regions as well as other mountainous areas with abundant mining resources such as Hebei, Inner Mongolia, Shanxi, Ningxia, Liaoning, Fujian, Guangdong, Henan and Yunnan.

After a decade of fast growth, the crawler excavator manufacturers can now be classified into four groups according to level of sales in 2007. **Group 1** comprises the traditional six leading international manufacturers: Komatsu, Hitachi, Doosan, Hyundai, Caterpillar and Kobelco, which sold more than 4,000 units each and together controlled 75 per cent of total market. Of these, Komatsu was the market leader in 2007 by selling 8,900 units, followed by Hitachi (7,726 units) and Doosan (7,015 units).

Group 2 consists of Liugong, Volvo, Sany etc, each having sales of 1,000-2,000 units, and a combined market share of 10 per cent. **Group 3** had another 10 cent of the market, and includes those suppliers selling around 500 units a year, such as Sumitomo, Kato, Case, Yuchai, Sunward, Shandong Joyo, XCG, Guizhou Jonyong and Foton Lovol. In **Group 4** there are more than 30 suppliers each selling fewer than 400 units a year.

Demand in 2008 is expected to stay at a high level although growth is expected to begin to slow down, perhaps to 20 per cent, with sales reaching 60,000 units. This should be the peak point and in the following three to four years demand should decline slightly and fluctuate between 50,000-60,000 units a year.

Crawler Loaders: This is a very specialist machine that has never found favour with contractors in China, and has only found applications in iron and steel works, and the army. There are only two suppliers, **Xuanhua** and **Xin Huanggong**, together selling fewer than 10 units a year, to which one can add some uncounted army orders.

Dump Trucks: Domestic sales for **rigid** dump trucks saw strong growth of 35 per cent to 682 units in 2007, partly due to the delivery to open cast mines of machines ordered throughout the previous three years. The main driver for sales came from coal mines, metal and metalloid ore exploration and limestone quarrying activities for cement plants. As a result of the consolidation taking place in the mining and raw material industries, the leading companies are now increasing capital investment to upgrade their capacity. In the construction sector, hydropower projects in West China also created steady demand.

The 31-50 tonne payload range, specifically the 32, 42 and 45 tonne classes, made up 40 per cent of total sales and remained the most important sector, due to the consistent demands of limestone and iron ore quarrying. Sales of machines in the 51-100 tonne range continued to increase, accounting for 12 per cent of the market and reflecting the trend towards larger machines in the pursuit of increased productivity. Sales of electric drive machines over 100 tonnes grew considerably to the region of 100 units in 2007, due to orders from opencast coal mines. The largest machine sold was the 326-tonne MT5500 from Terex-Unit Rig. After a fall in 2005, sales of smaller trucks in the 20-30 tonne range rebounded to over 200 units, in response to both construction demand and for lighter jobs in quarrying sites.

NHL led the domestic market with a 40 per cent share, which included the delivery of Unit Rig heavy trucks, and it also saw significant export growth principally to neighbouring countries. Its production capacity has been saturated by the surging demand and the factory is struggling to catch up with the increased orders. **Beijing Zhonghuan Kinetics – BZK**, on the other hand, saw a drop in production due to the falling sales of its 25 tonne machines and difficulty in penetrating the market for machines up to 50 tonne payload. **Belaz** achieved substantial sales of its 130 tonne electric drive trucks, which helped increase its market share to 15 per cent. **Beijing Shougang** restored its sales to 53 units, after a restructuring of the company. **Komatsu** and **Hitachi** continued to import large trucks to coal and copper mines, while Komatsu is assembling smaller models in its Changzhou factory.

In view of the ongoing efforts by major mines to increase their capacity and their need to replace old machines, as well as the substantial orders already placed with suppliers, the market is forecast to continue its growth to the region of 800 units a year in the near future, of which a growing percentage will be accounted for by machines over 50 tonnes and smaller machines under 30 tonnes.

Articulated dump trucks: Still seen as expensive product, compared to plentiful and cheap on-highway trucks, they suffer from a lack of understanding on the part of the market as to their real

virtues. As a result, growth has relied on demand from the mining industry, and the market preference has moved towards the larger, 35-40 tonne payload machines. **Volvo** continued its success in 2007 and occupied the whole market; **BZK** continued to develop its more sophisticated products. The outlook for the market remains positive. However, as a result of a shift in government import tax policy it will become increasingly difficult to obtain import tax exemption. This is likely to lead to locally produced rigid machines enhancing their price advantage over imported ADT's and eating into part of the market.

Mini Excavators: Sales in 2007 rose 41 per cent to 16,850 units, in line with the expectations of most of the market and is largely attributable to the aggressive promotion of several new entrants such as **Foton Lovol**, **Guangxi Kaiyuan** and **Hitachi**. In contrast, the three leading manufacturers experienced lower growth rates: **Beijing Hyundai** up 32 per cent, **Doosan** 35 per cent and **Yuchai** only six per cent. Demand was highly concentrated on the four provinces of Jiangsu, Sichuan, Shandong and Anhui, which together accounted for 40 per cent of total sales.

The structure of the market changed again in 2007 with the 5-6 tonne range becoming even more popular, accounting for 79 per cent of the market, up two percentage points compared with 2006. In contrast, the market share of 3-4 tonne machines declined from 11 per cent in 2006 to six per cent in 2007, while the 4-5 tonne range rose from eight per cent in 2006 to 12 per cent in 2007.

Exports have been an increasingly important feature of the sector. In 2007 they totalled 3,100 units, up 10 per cent compared with the 2,800 units sold abroad in 2006. Sunward almost doubled its export volume from 440 units in 2006 to 850 units in 2007 and outdid Yuchai and Doosan to become the top exporter in 2007, while these two suppliers saw sharply reduced exports. The three other local manufacturers Nante, Shandong Carter and Hefei Zhenyu also contributed greatly to the growth of exports, together accounting for 30 per cent of the total. Export models are principally in the 1-3 tonne range, a size that is not popular in the domestic market.

There is little doubt that demand will continue to grow, but the growth rate will not be as high as the previous two years. Off-Highway Research believes that the market will further increase by 30 per cent to 22,000 units in 2008, and then grow about 10 per cent each year to peak at 35,000 units in 2012.

Mobile Cranes: The market has continued the surge begun in 2006, and grew 30 per cent to 18,250 units in 2007, a total growth of 67 per cent over 2005. Due to the almost universal use of mobile cranes for everything from construction to logistics, demand has become closely linked to

general economic conditions: the current scale of economic growth has pushed demand to record levels.

Truck-mounted cranes made up 94 per cent of total sales, although the sector expanded at a slightly slower rate than the total market. China is the world's largest market for truck-mounted cranes. Recently there has been a trend towards larger machines. In 2007, all size ranges witnessed growth, but it was the over 20 tonne market that grew most. Machines below 20 tonne lift capacity still made up 63 per cent of the market, but the 25 tonne machine, which accounted for a quarter of the market, has made rapid strides, taking market share from 16 tonne machines. Demand for 35-50 tonne machines rose 64 per cent, while sales in the 65-130 tonne range nearly doubled to over 150 units.

The increased demand for large lift capacity machines and the development of the manufacturing capabilities of Chinese manufacturers resulted in a substantial growth in the **all terrain crane** market which witnessed total sales of 68 units, of which 37 units came from XCMG. There were, however, no domestic sales of **rough terrain** cranes. **Industrial crane** sales grew rapidly to 272 units in 2007.

The market for **crawler cranes** continued to expand rapidly, with sales totalling 706 units, which made China the largest single market for crawler cranes. While sales in the under 100 tonne range continued to increase due to demand from construction and cargo handling, the over 100 tonne range saw even faster growth and made up 20 per cent of the market. The rise of Chinese manufacturers was also remarkable and they increased their penetration in the over 300 tonne range to 43 per cent.

XCMG led the domestic market and occupied 46 per cent of sales, thanks to its domination in truck-mounted cranes and in particular in the rapidly expanding heavier range. **Zoomlion's** market share rose to 19 per cent, and it performed much better in truck-mounted cranes of over 80 tonne lift capacity. **Changjiang**, in which Terex holds a 50 per cent stake, remained stagnant overall but progressed well in large truck-mounted cranes. **Tai'an Crane** and **Bengbu** also saw buoyant growth, but they continued to focus on the smaller range under 50 tonnes; both companies have completed their restructuring with new shareholders in the first quarter of 2008: Manitowoc for Tai'an Crane and Liugong for Bengbu. **Fushun Excavator** increased its share in the crawler crane market to 35 per cent, and also saw buoyant exports. **Sany** made significant progress in crawler cranes, with a remarkable rise in the over 100 tonne range, and it also intends a substantial increase the production of truck-mounted cranes in 2008.

Among importers, **Manitowoc** saw sales of all-terrain cranes rise to 21 units, an increase of 75 per cent over 2006, and also remained important in the crawler sector. **Kobelco** and **Hitachi-Sumitomo**, two Japanese suppliers of crawler cranes, faced strong competition from Chinese manufacturers, although they attributed their stagnation in China to strong demand for their machines in other countries. **Liebherr** witnessed a drop in sales in 2007, while **Demag** saw only a modest growth over the previous year.

Although the market recorded its highest sales to date in 2007, it is expected to see a further rise in 2008. The major infrastructure projects such as high speed railways and power stations will continue to create strong demand, while urban construction remains at a consistently high level. The reconstruction of infrastructure after the heavy snow at the beginning of 2008 will add further demand for mobile cranes. Although in the mid-term the market is forecast to slow down due to the rapid accumulation of new machines, the increasing demand for large cranes will remain undiminished.

Motor Graders: The market grew by 17 per cent in 2007, to 1,766 units, another record high. Demand was boosted by on-going road projects and the need to renew old fleets; in addition, the levelling of unpaved roads in mining and quarrying sites also increased demand for graders.

The domestic market is now divided into three horsepower ranges: 160-175 horsepower (29 per cent), 180-195 horsepower (47 per cent) and 200-220 horsepower (23 per cent), while smaller machines of 120-135 horsepower also saw modest sales. There has been a consistent trend to move to the larger range of over 200 horsepower, as indicated by the drop in sales of 160 horsepower machines.

In 2007 **XCMG** replaced **DTCM** and became the market leader, and the two respectively took 31 and 27 per cent of market share. They were followed by **Dahua**, **Sany** and **Changlin**. **Liugong** and **Yituo** rose substantially and also achieved good exports. **Caterpillar** enhanced its position with eight per cent of the domestic market and substantially increased exports.

The market for motor graders is expected to see further growth in 2008 and to grow to the region of 1,700-1,800 units in the mid-term. However, given the limited applications of a grader, buyers have always been cautious about direct ownership. Therefore, the industry should not assume continuous growth of the domestic market and expanding production capacity is increasingly accounted for by the export market.

Skid-Steer Loaders: This niche market recorded a growth of 20 per cent, and total domestic sales amounted to 250 units in 2007. Over the previous three years, the market had already improved to more than 200 units as the maintenance sector began to realise the value of the machine's versatility, and suppliers also tried to promote this. However, the marketing of this concept in China remains a challenge for suppliers. On the other hand, Chinese manufacturers have increased production and their export volume exceeded domestic sales eight-fold.

The most popular applications for skid-steer loaders in China are now road maintenance and utility works; as a result, larger capacity machines are preferred and machines over 900 kilogrammes accounted for nearly 60 per cent of the market. The smaller machines under 700 kilogrammes accounted for about 10 per cent, and there was no demand for under 450 kilogramme machines.

Bobcat sold only 75 units in 2007. Its falling sales over the last two years have really held back the development of the total market. **Case**, on the other hand, has seen sales grow steadily and is now the market leader, with nearly 40 per cent market share. **Caterpillar** sales remained stagnant, despite of its considerable promotion activities. Among Chinese manufacturers, **Liugong** and **Sunward** made progress in the domestic market, while an increasing number of Chinese companies, lead by **Hero Times**, have developed skid-steers for the sole purpose of exporting them.

The development of this market will to a large extent be dependent on the consistent marketing efforts of manufacturers in an effort to exploit the potential demand in the road and municipal sectors as well as industrial applications. A reasonable pricing structure would also help sales to Chinese customers. With growing demands from the maintenance sector, the market has the potential to increase rapidly in the next few years, but it will still remain a niche sector compared to the overall off-highway market.

Telescopic Handlers: These have never been popular in China, as they face competition from a host of cheap alternatives, especially mobile cranes and wheeled loaders. Growth in recent years has been largely from foreign customers doing business in the country, and they may well be in a position to promote the concept. The domestic market could grow modestly, with more Chinese manufacturers developing versions of the product.

Wheeled Excavators: The sales of wheeled excavators rose 47 per cent from 547 units in 2006 to 806 units in 2007, a growth rate which exceeded that of both crawler excavators (46 per cent) and mini excavators (41 per cent). The main demand for wheeled excavators comes from urban

utility works, disaster relief and agricultural irrigation that require rapid mobility. However, the relatively high price compared with that of an equivalent crawler product has hindered its popularity. Most importantly, sales of wheeled excavators are concentrated in only a few areas such as Beijing, Jiangsu, Sichuan, Chongqing and Xinjiang, each of which accounted for around 100 units. This indicates that there is considerable potential for suppliers to promote this type of machine in other areas if they can convince customers of the merits of the mobility of wheeled machines. In this context, the extreme weather experienced in southern China in January and February 2008 might be a turning point for demand for wheeled machines due to their important contribution to relief efforts.

Beijing Hyundai, Doosan Infracore and Guizhou Jonyang remained the three major suppliers in this sector and together provided 91 per cent of the total market in 2007. Guizhou Jonyang was not the market leader in terms of sales, although it was the largest producer in 2007. It sold its machines to three sectors: 30 per cent to the domestic market, 30 per cent for exports and 40 per cent to the military.

Although several local manufacturers including Sunward, Xuzhou Excavator, Shandong Joyo, Liugong and Sany have launched prototypes, there have been no sales yet. The presence of these new entrants will help promote the concept of wheeled excavators, and although demand is not likely to witness a sharp growth in the short term, the overall trend remains positive.

A group of local manufacturers, such as Shandong Hengte and Shandong Yugong, produce annually several hundred low-spec wheeled excavators (and crawler excavators) sold at very cheap prices. These machines, however, were not included in the statistics for sales of standard excavators.

Wheeled Loaders: Although observers expected a slowdown at the beginning of 2007, the demand for this most popular construction machine rose again in 2007. Domestic sales achieved a growth of 19 per cent and increased to 150,000 units. The market was driven by the buoyant construction sector and consistently growing demand from the mining industry. The most important market regions were in the northern provinces of Hebei, Shanxi, Inner Mongolia Liaoning and Henan, and the eastern provinces of Shandong and Jiangsu. Such western provinces as Sichuan, Yunnan, Shaanxi and Xinjiang also took a significant percentage. These provinces either had a booming construction sector, or play an important role in mining. It is notable that beyond this large volume covered by current statistics, there was also a considerable number of cheap wheeled loaders being used in rural works and on light construction jobs. The

total volume of these is believed to be in the region of 50,000-80,000 units, with most of them under 70 horsepower.

In the market for standard wheeled loaders, the most popular machines in the 220 horsepower range (ZL50), which in 2007 increased their market share to 65 per cent. They are widely used for construction and material handling, and in particular, in coal and metal ores mines. The next most important class was the 125 horsepower (ZL30) sector. These 'medium' machines are used for light construction; their overall market share diminished to 28 per cent in 2007. The intermediate range (ZL40) remained stagnant. Compact loaders under 80 horsepower (not including cheap machines) saw continued sales growth and maintained a market share of five per cent. At the other end of the scale, demand for the largest machines (over 220 horsepower) continued to grow but was still of a tiny percentage of the total market.

While the market was buoyant, the industry has had to confront both price competition and escalating costs for steel and rubber. As the major manufacturers have increased their control of the market, they are now in a position to increase prices by between 10-15 per cent in 2008. Such an increase does run the risk of affecting negatively the domestic market. Domestic manufacturers also increased their emphasis on exports in 2007, and this pushed the total domestic output to over 160,000 units.

The top 10 manufacturers, namely **Longgong**, **Liugong**, **Xiagong**, **Lingong**, **SEM**, **Chenggong**, **XCMG**, **Foton**, **Changlin** and **Jingong** (ordered by sales in the domestic market), enhanced their combined market share to 90 per cent. Over the past few years, they have upgraded their manufacturing facilities and launched new products with improved reliability and work efficiency, increasing their competitive advantage over smaller companies with lower investment levels. It is expected the major manufacturers will further enhance their domination with the introduction of new financing measures to support sales and an expansion of production. In 2007, XCMG opened a new factory in Chongqing, and Xiagong constructed another one in Jiaozuo in Henan Province. Liugong also showed its intention to invest in a new facility in Tianjin, while there has also been some consolidation, such as the merger of Changsong and Yigong into Jiangsu World.

The penetration of international brands remained low, despite their important role in the over 220 horsepower range. Among them, **Komatsu** led the way with modest production in its Changzhou factory. This was followed by imports from **Caterpillar**, **Volvo** and **Hitachi**. However, foreign companies have achieved significant progress in investment in this industry. Volvo has already been successful in its joint venture with Lingong, and Caterpillar, having

completed the full acquisition of SEM in January 2008, is set to open the Suzhou factory in 2009. Doosan has also begun to develop wheeled loaders in Yantai following the acquisition of a small local company.

Given the trend of the economy, it seems clear that the market for wheeled loaders will continue to grow. Will it reach 200,000 units a year? The answer is 'quite probably'. Indeed, if the large volume of the 'cheap' loaders now available in the rural market is taken into account, the total market already exceeds this figure. For 2008, in view of the new infrastructure projects, booming urban development and the consistent demand from mining, the market is forecast to grow by about 10 per cent – that is, to reach 165,000-170,000. However, given the huge machine population available in the market and the government's policy to control investment growth, the market may begin to stagnate in 2009-2010. Further growth will return as new construction projects are begun, while the replacement of the current market for the 'cheap' machines may become an important source of further expansion.

The industry will also become more sophisticated, with increased domination by the leading manufacturers through their commitment to product upgrading. Rising production costs will encourage manufacturers to give more emphasis to product engineering in order to remain competitive. Although the market will remain focussed on price, efficiency and reliability will grow in significance when determining which machine to buy.

EXPORTS

The rise in exports has been a characteristic of the industry for the last three years. In 2007, the total export volume increased by 86 per cent to 31,000 units and accounted for 11 per cent of total domestic production. It should be remembered that only three years ago the proportion of exports was only five per cent. Production capacity is growing, so the importance of exports is expected to increase further. The main destinations were Asia, Africa, Russia and East Europe and South America, while there have been good sales of compact equipment to the more developed markets. The role of Chinese contractors who purchase machines for their overseas projects and the Chinese government's financial assistance have also made significant contributions to export growth, and Chinese manufacturers have made progress in establishing overseas distribution networks. Major companies as such as Liugong, Sany and XCMG have developed or plan to develop overseas factories as well.

Table 11. China: Exports of Construction Equipment by Type, 2006-2007

(Units)

	2006	2007	% Change
Asphalt Finishers	50	70	+40
Backhoe Loaders	39	366	+838
Compaction Equipment	1,400	3,490	+149
Crawler Dozers	1,081	2,220	+105
Hydraulic Excavators	2,903	3,810	+31
Mini Excavators	2,844	3,100	+9
Mobile Cranes	893	2,737	+206
Motor Graders	970	2,798	+188
Rigid Dump Trucks	102	160	+57
Skid Steer Loaders	1,270	2,090	+65
Wheeled Loaders	5,037	10,055	+100
Total	16,589	30,896	+86
% of Domestic Production	8	11	

Source: Off-Highway Research

With the number of Chinese exporters increasing, even small companies have been offering their products on the Internet. However, it is the major manufacturers that are playing the central role in developing this market:

<u>XCMG:</u>	Mobile cranes, wheeled loaders and road machinery
<u>Liugong:</u>	Wheeled loaders, crawler excavators and road machinery
<u>Shantui:</u>	Crawler excavators and components
<u>Sany:</u>	Concrete pumps, crawler cranes and road machinery
<u>NHL:</u>	Rigid dump trucks
<u>Fushun Excavators:</u>	Crawler cranes
<u>Yuchai:</u>	Mini excavators
<u>Sunward:</u>	Mini excavators and skid-steer loaders
<u>Hero Times:</u>	Skid-steer loaders

China is also becoming a production base for international manufacturers, as reflected by the growing export activities of international OEMs. These include **Caterpillar** (crawler excavators and motor graders, with wheeled loaders due in 2009), **Komatsu** (crawler excavators and components), **Doosan** (mini excavators) and **Bomag** (compaction equipment), all of which have now become significant exporters. Although the economic advantage of manufacturing in China has been reduced by rising material and labour costs, it represents an opportunity for important production cost savings and to increase overall production capacity.

INTERNATIONAL PERSPECTIVES

Sales

China: The growth in sales has resumed after the pause of 2004-2005, with increases over 20 per cent in both years since then. Demand for wheeled loaders, which account for two out of every three machines sold, continued unabated, and it is their huge sales volumes that have contributed to another record year in 2007.

The outlook is for more growth across all product sectors, the most significant new trend being the remarkable rise in popularity of mini excavators.

Table 12. Regional Sales of Construction Equipment, 2007-2008

(Units)

	China		North America		Western Europe		Japan		India	
	2007	2008*	2007	2008*	2007	2008*	2007	2008*	2007	2008*
Articulated Dump Trucks	91	100	3,735	3,000	3,063	2,743	90	90	13	15
Asphalt Finishers	1,027	1,100	2,725	2,300	1,544	1,448	240	250	265	300
Backhoe Loaders	583	800	20,900	18,200	13,745	12,340	4	5	21,761	30,000
Crawler Dozers	5,273	5,400	14,355	12,500	1,915	1,623	1,500	1,500	627	700
Crawler Excavators	49,167	60,000	24,600	21,500	35,697	31,780	33,070	34,700	9,645	14,000
Crawler Loaders	10	10	835	725	386	302	80	70	-	5
Mini Excavators	16,850	22,000	26,500	22,500	70,878	64,355	29,200	27,750	10	25
Motor Graders	1,766	1,850	4,635	4,200	496	424	210	210	544	750
Motor Scrapers	2	3	600	450	5	6	20	20	-	-
Rigid Dump Trucks	687	750	980	900	553	534	180	180	594	725
RTLs – Masted	-	-	3,375	2,900	2,797	2,104	-	-	-	-
RTLs – Telescopic	20	20	16,500	14,500	30,320	28,505	2	2	11	50
Skid Steer Loaders	250	300	52,850	46,000	12,855	12,075	1,130	1,100	190	300
Wheeled Excavators	806	1,000	870	800	11,151	10,875	190	150	5	20
Wheeled Loaders	149,730	165,000	18,700	15,900	26,155	25,045	10,300	10,800	2,386	3,200
Total	226,262	258,333	192,160	166,375	211,560	194,159	76,216	76,827	36,051	50,090
	+25	+14	-16	-14	+12	-8	+4	+1	+47	+39

* Forecast

Source: Off-Highway Research

North America: Following massive advances in 2004 and 2005, the North American market cooled in 2006 and really went into serious decline in 2007. The decrease in 2007 was variable, since mining and public works are both in good shape. Products associated with private construction performed the worst, led by a big fall in telescopic handlers and above average declines in crawler excavators and backhoe loaders.

The forecast calls for further declines in 2008 and 2009, with the cyclical recovery not evident until 2010.

Western Europe: Strong growth was experienced across the board, in almost all countries and in almost all products, and regional sales saw a 12 per cent growth to a record level of 212,560 units. Demand was particularly strong for mini excavators, crawler excavators and telescopic handlers.

Japan: 2007 witnessed another year of the slow, steady climb of the construction equipment market out of the trough that had its lowest point in 2003. The motors were a slight improvement in public works volume, a larger improvement in the private investment climate and the willingness of rental companies to renew their fleets. A final significant factor was the ease of exporting used construction equipment, which is in great demand, now that south-east Asia is booming once again. Some slowness occurred in house building because of a new law concerning earthquake proofing and demand was slowing again by the end of the calendar year.

India: For the first time this review gives an overview of this fast growing market. 2007 showed a remarkable increase of nearly 50 per cent in total sales, bringing them to nearly four times the level of 2003. In this market the backhoe loader is the king, taking six out of every 10 sales. Growth in crawler excavators is also impressive and they now sell four times as many as in 2003. In the longer term backhoe loaders could rise to 50,000 units annually and crawler excavators to 40,000, if plans to build a new national infrastructure stay on track. A major market, indeed.

Production

The table below marks a historic milestone, the first year ever in which China is the world's largest producer of construction equipment. It has leaped from fourth to first place in a single year. The other three major regions, all at the same level in 2006, have suffered diverging fates in 2007.

Table 13. Production, by Type and Region, of Construction Equipment, 2007

(Units)

	China	Western Europe	Japan	North America
Articulated Dump Trucks	1	6,793	800	600
Asphalt Finishers	1,038	3,305	260	2,785
Backhoe Loaders	931	41,700	-	27,050
Crawler Dozers	7,596	2,020	8,250	11,775
Crawler Excavators	50,255	28,513	84,500	14,100
Crawler Loaders	10	1,555	250	-
Mini Excavators	20,615	53,575	94,030	10,000
Motor Graders	4,813	511	2,100	5,140
Motor Scrapers	2	25	-	650
Rigid Dump Trucks	719	475	900	2,975
RTLTs – Masted	-	3,985	-	3,400
RTLTs – Telescopic	50	32,302	-	16,300
Skid-Steer Loaders	2,432	4,355	2,650	71,800
Wheeled Excavators	1,127	14,004	1,900	445
Wheeled Loaders	164,790	37,598	16,900	18,590
Wheeled Loaders < 80 hp	8,410	16,565	6,450	290
Wheeled Loaders > 80 hp	156,380	21,033	10,540	18,300
Total	254,378	230,716	212,630	185,610

Source: Off-Highway Research

China: Production increased strongly for a second year. More than 250,000 units were produced in 2007, a massive increase of 30 per cent on the previous year. Domestic demand increased by 25 per cent in 2007, whilst exports grew by 50 per cent to 25,000 machines, led by a doubling of wheeled loader exports.

The astounding production of wheeled loaders increased by 24 per cent, a growth in units that is more than the whole European production for a single year. For the second year running, the number of crawler excavators produced increased by 45 per cent, while the growth of the mini excavator continues in China as elsewhere in the world. In 2007, more than 20,000 units were produced, an increase of a third over the previous year.

Europe: In 2007 production volumes reached an all time peak of 231,000 machines, an astonishing growth of 54 per cent in four years. The high level naturally reflects the substantial growth in regional demand during this period, but also underlines the importance of exports.

Japan: Production in 2007 rose to a six-year peak of 212,600 units on the back of a much improved export performance and a good first half in the home market. Great progress was registered in crawler excavators, while other products such as dump trucks and motor graders

thrived on export orders. Others seemed to have passed a peak of output early in the year and are no longer growing – wheeled loaders and skid-steer loaders for example.

North America: From 2003 to 2006 output was growing but it has turned decisively downwards in 2007, with a general decline of nine per cent. It is interesting to note that of this total, 39 per cent was accounted for by skid-steer loaders, production of which fell by less than five per cent.

Keen not to accumulate inventory, manufacturers cut volumes most severely in articulated dump trucks (40 per cent) and by around 15 per cent in crawler dozers, crawler excavators, telescopic handlers and wheeled loaders. Conversely, mini excavators, motor graders and rigid dump trucks were untouched. North American production was only some 7,000 units lower than domestic demand, indicating that imports were struggling in view of the low dollar value.

DEERE PURCHASES XCG, A CHINESE MANUFACTURER OF HYDRAULIC EXCAVATORS

At the end of February, Deere announced that it had purchased a 50 per cent equity stake in Xuzhou Excavator Manufacture (XCG), a manufacturer of hydraulic excavators based in the Chinese city of Xuzhou, Jiangsu Province.

It has been known for some time that Deere was keen to enter the rapidly growing Chinese construction equipment industry, and that a joint venture (or ideally an outright acquisition) was the most cost and time effective option. Acquisition opportunities in the Chinese excavator market were relatively limited, however, with the leading domestic manufacturers, Liugong, Sany, and Yuchai all also offering broad product lines in other sectors. XCG was the only domestic excavator manufacturer of any substance that was available, and that was also actively looking for an overseas partner.

For Deere, the stake offers a modern factory that was built in 2004, with around 35,000 m² covered area and a capacity of about 2,000 units a year. In XCG's product range there is a 6 tonne mini excavator, 12 crawler excavators in the 8.8-45.0 tonne class, and a 14.0 tonne wheeled excavator. The company has around 60 independent domestic dealers, which together offer almost national coverage. Exports began in 2004 and grew sharply in 2007 by about 220 units. They now account for 30 per cent of total sales.

XCG has an unusual history, even for a Chinese manufacturer. It has its foundations in XCMG's Research Institute which started to develop a range of excavators in 1993. As XCMG had a joint venture with Caterpillar that prevented the Chinese partner from developing its own excavators, the excavator operation was sold to Xuzhou Bohui, a large local steel company and – coincidentally – a major component supplier to Caterpillar. In 2000 the company officially separated from XCMG, although close links still remain with its former owners: all of the staff comes from XCMG, similar components are used, and some (but not all) of domestic and overseas sales use the XCMG distribution network.

The history and background of XCG is a typically tortuous Chinese arrangement that Deere will do well to understand, and then put behind it in order to make the inevitable changes required for the joint venture to flourish. It is understood that the company will continue to sell machines overseas, so doubtless great care will be taken in this activity not to infringe on Deere's joint venture with Hitachi, a relationship that it values highly. It will be interesting to see how the machines of the new joint venture will be branded.

In 2007, XCG employed about 350 people, of whom 200 were shop floor workers, 60 were in R&D, and 30 in sales and service. It is understood that sales in 2007 were about RMB450 million (about \$57 million), and pre-tax profits were marginal.

Table 14. China: Sales of Crawler Excavators, 2002-2007

	Units
2002	18,700
2003	31,400
2004	26,100
2005	23,180
2006	33,700
2007	49,000
2008*	60,000

* Forecast

Source: Off-Highway Research

Looking at the Chinese crawler excavator market as a whole, it is now by far and away the largest in the world. Enormous growth took place at the beginning of the decade; in 1999 sales were a paltry 5,600 units, but had more than trebled to 18,600 units by 2002. After a slow down in 2004-2005 because of the credit crisis, sales rebounded strongly in 2006, when sales exceeded 33,000 units, with a further surge in 2007 to almost 50,000 units.

Deere, therefore, is entering a market near the top of its cycle. XCG has made reasonable progress in a rapidly growing market, but has doubtless been hindered by a combination of poor cash flow, inadequate management and production techniques, and little access to the latest technology. All of these impediments should be greatly assisted by Deere's involvement, and while there will be considerable changes, the potential rewards for both parties are great.

XCG's production in 2007 was probably around 800 units, out of a total domestic output of just over 50,000 units. This put XCG in 13th position amongst all manufacturers, and in fourth position amongst the Chinese OEMs behind Liugong, Sany and Yuchai. In a growing market, and with a currently installed capacity of 2,000 units a year, the new joint venture should be well placed to rapidly expand production.