

EQUIPMENT ANALYSIS: CHINA

WHEELED LOADERS

FEBRUARY 2003

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INTRODUCTION

This report covers the Chinese market for wheeled loaders, both articulated and rigid. Demand covers the range from the smallest at around 30 horsepower, to the largest at up to 300 horsepower. The study only includes purpose-built wheeled loaders; backhoe loaders and skid-steer loaders are excluded from the analysis.

Wheeled loaders are one of the most dynamic and fast growing sectors in the construction equipment industry in China. Their dramatic recent increase in demand accurately mirrors the extraordinary growth in construction activity that has taken place throughout the country in the last five years, and the sector's importance to the construction equipment as a whole cannot be underestimated.

It is sobering to realise that the Chinese wheeled loader industry, in terms of unit sales and production, is now three times that of Europe's, four times that of North America's and six times that of Japan's. Indeed, sales in China in 2002 were some 25 per cent more than these three markets combined.

Table 1. China: Wheeled Loader Designations by Horsepower Category

Model	Horsepower
ZL05-08	Under 40
ZL15-18	40-80
ZL20	81-100
ZL30	101-150
ZL35	121-150
ZL40	151-200
ZL50	201-220
ZL60	221-270
ZL80-ZL100	Over 270

Source: Off-Highway Research

Before offering a rigorous analysis of the sector, some notes to Chinese size classifications might be useful to those readers who might not be familiar with the domestic industry. Wheeled loaders produced by the domestic manufacturers all have the same designations, with two letters

“ZL” followed by numbers indicating the rated weights. For example, the ZL50 model refers to a wheeled loader with 5-tonne rated load. The table below above the approximate horsepower categories for each model.

The findings presented in this report are based on information collected through personal interviews with most of the major manufacturers. In addition, Off-Highway Research acknowledges the invaluable support and statistical data offered by the China Construction Machinery Association.

There are a number of government sectors and major trade associations connected with the construction and manufacturing industries relevant to this study. These include:

The Ministry of Communications (MOC), which administers highway and waterway transportation in China. Its Department of Comprehensive Planning frames the national highway development plan on a long-mid term and annual basis, and the Department of Highway Administration manages highway construction activities. The MOC publishes statistical data on the highway programme on an annual basis.

The China Highway Society, which represents road construction and maintenance. It has a special subsidiary called the Branch of Highway Construction and Maintenance Machines, which is based in Beijing and consists of machine management units for the road construction industry.

The China Construction Machinery Association (CCMA) serves as an intermediary organisation between the government and the construction equipment industry, and currently plays a central role in guiding the industry’s development. Its subsidiary for earthmoving machines is based in Tianjin.

SUMMARY

In 2002 wheeled loader sales exceeded 46,000 units, 52 per cent more than in 2001. In 2002 a total of 50,500 wheeled loaders were produced, a 57 per cent increase over the year. Domestic manufacturers dominate the market, taking more than 98 per cent in 2002. An estimated 20 per cent of the market is controlled by domestic private manufacturers, while the other 78 percent is controlled by State Owned Enterprises. The latter’s share of the market will probably fall in the next few years as an increasing number of companies become privatised.

Imports are very few indeed, and are restricted to around 100 units a year. Almost all of these are over 220 horsepower and in sizes where the domestic industry does not offer any competition. Given the extraordinary disparity in price between an imported machine and one that is locally produced, there is little hope of imports making any impact at all on the enormous volume sector which lies under 220 horsepower.

Only a few domestic companies build all sizes of wheeled loaders, largely for historical reasons. In medium products, demand tends to focus on a handful of models, the types ZL50, ZL30 and ZL40 covering 98 per cent of the total. Smaller models are likely to experience growing success in coastal areas where labour is becoming more expensive, but selling them is very difficult. Those who need the largest machines, say over 250 horsepower, still rely on imported wheeled loaders and joint venture products, but the numbers involved are really very small given the enormity of the market, and their sales depend on major projects sponsored by the government.

The annual production capacity is around 55,000 units. Though demand rose to 46,000 units in 2002, Off-Highway Research estimates that 20,000 units of newly expanded capacity will need to find a market in 2003. This might be achievable in the short term, but the excess capacity available will cause problems for the industry by the middle of this decade, and will probably result in a further round of price cutting, and consolidation within the industry.

There are no fewer than 90 manufacturers with sales varying from 7,000 units down to less than 20 units. Among them, 15 suppliers have an annual sales volume of over 1,000 machines each, most of them with a strong national reputation and the ability to cover the overheads of distribution and after sales support effectively. The market is moving swiftly towards a situation where fewer than 10 players will probably dominate by 2006. The market structure has not stabilised yet, though the number of manufacturers is diminishing. More acquisitions and bankruptcies are expected in the near future.

A recent price war has had the effect of reducing manufacturers' profits. Although the leading players have won increased sales and market shares, the profit per unit is going down, which will ultimately negatively affect after-sales service, product support and R&D. Very importantly the very modest margins currently being made will limit manufacturers' ability to diversify into other, more profitable sectors.

All companies have to reduce unit costs and seek increasing volumes. Most specialists and few manufacturers are thinking of new products other than wheeled loaders or have started creating them. The technology needed in the installation of production capacity and the ability to

promote and sell new products all make it very difficult to diversify without some sort of outside help. As a result almost all companies are currently seeking international partnerships, with varying degrees of success.

Table 2. China: Statistical Summary of Wheeled Loaders, 2002

Number of Suppliers	90
Number of Joint Ventures	1
Market Leaders	Xiamen Engineering Guangxi Liugong.
Production (units)	50,500
Sales (units)	46,100
Importers' Penetration (%)	<1
Population (units)	270,000
Sales Forecast 2007 (units)	50,000

Source: Off-Highway Research

The market leaders are Xiamen Engineering (Xiagong) and Liugong, with less than one per cent difference in sales between them. Both have around 16 per cent market share, both produce more than 7,000 units a year, and both plan to increase output to 10,000 units during 2003.

This sector is becoming increasingly difficult for imported machines, sales of which have fallen from 4,244 units in 1993, to 146 in 2001 and around the same number in 2002. The enormous price difference between imports and domestic products has always been, and will continue to remain for the foreseeable future, the barrier to success for them. On the other hand, domestic manufacturers have not been successful in overseas markets.

Chinese products display a perfectly acceptable level of technology, in the eyes of the domestic market. The highest quality products, as shown in the various G series versions, are oriented towards big projects, state contractors or the overseas market. Interestingly, however the new breed of private contractors are accepting the virtues of their better reliability and greater productivity, and are prepared to pay the higher prices involved. Most key components such as diesel engines, axles and transmissions, hydraulics, and for certain manufacturers, cabs and wheels, are being bought in, either from specialist local suppliers, with preferences to joint ventures, or increasingly from overseas. Foreign component manufacturers are particularly well placed to secure greater business from the slow, but gradual move towards better quality machines.

The demand for wheeled loaders in the future will rely heavily on the continued investment in new infrastructure. The market will continue to grow to a peak of around 58,000 units in 2004 but then start to drop from 2005 as the sector becomes saturated with nearly new machines. Thereafter the market will level off at around 50,000 units a year, with sales being fuelled by replacement demand rather than additions to existing fleets.

Once demand begins to fall back, it can be expected that there will be a wholesale restructuring of the domestic industry: the larger companies will ease out their smaller, weaker competitors who will not be able to offer either the technical expertise, the distribution network or the customer service that the next generation of customers will come to expect.

ECONOMIC TRENDS

From 1978 to 1989, China's economy maintained an average annual growth rate of 9.5 per cent, which dropped very slightly to 9.3 per cent from 1989 to 2001. The recent healthy economic performance can be attributed to a proactive fiscal policy, which was introduced after the 1997 Asian financial crisis and buoyed China's economy against regional and worldwide trends. Since 1998, RMB510 billion (\$61.6 billion) of treasury bonds have been issued by the country. Most of the money has been invested in fixed assets and has been the engine of economic growth.

Table 3. China: Basic Economic Indicators, 1997-2002

(Real annual % Change)

	1997	1998	1999	2000	2001	2002
Real GDP Growth	8.8	7.8	7.1	8.0	7.3	8.0
Gross Fixed Investment	8.3	14.1	5.2	9.3	12.1	16.0
- Infrastructure	14.5	20.0	5.9	6.1	8.5	-
- Renovation and Reconstruction	6.8	13.9	-2.2	13.2	15.3	-
- Real estate	-3.4	12.6	11	19.5	25.3	-
Exports	20.9	0.5	6.1	27.8	6.8	20.0
Imports	2.5	-1.5	18.2	35.8	8.2	15.0
Consumer Prices	2.8	-0.8	-1.4	0.4	0.7	0.0

Source: National Bureau of Statistics (NBS)

Early in 1999, China announced its plan to develop its western regions to narrow the widening gap between east and west. Western China in this campaign refers to **Chongqing Municipality; Sichuan, Guizhou, Yunnan, Shaanxi, Gansu, Qinghai** provinces; and **Tibet, Ningxia Hui, Xinjiang Uygur, Inner Mongolia and Guangxi Zhuang Autonomous Regions**. Infrastructure

construction, which is expected to fuel the local economy, has been placed at the top of the development agenda.

By the beginning of the new millennium, China had realised its objective of quadrupling its Gross Domestic Product (GDP) since 1980, and has entered a new stage of building a prosperous, socialist society and enhancing its modernisation drive.

CONSTRUCTION ACTIVITY

Government expenditure has displayed a trend to adopt medium and long-term financial policies. About RMB150 billion (\$18 billion) of long term treasury bonds were issued in 2001, bringing the total bond issued from 1998 through 2001 to RMB510 billion (\$61.4 billion). Funds for another RMB150 billion (\$18 billion) raised in 2002 have been used mainly for development projects in the western regions, the technological transformation of key enterprises and water diversion from the south to the north.

Table 4. China: Gross Fixed Investment, 1997-2001

(Real % Change)

	1997	1998	1999	2000	2001
Real GDP Growth	8.8	7.8	7.1	8.0	7.3
Gross Fixed Investment	8.3	14.1	5.2	9.3	12.1
- Infrastructure	14.5	20.0	5.9	6.1	8.5
- Renovation and Reconstruction	6.8	13.9	-2.2	13.2	15.3
- Real estate	-3.4	12.6	11	19.5	25.3

Source: National Bureau of Statistics

Public bidding for construction contracts has been directed through practices to foster fair competition among construction firms and guarantees sound quality of the projects. The State Development Planning Commission (SDPC) is authorized to govern public bidding and inspect key State-invested projects. Builders of most key projects in which the central government has invested in recent years were found through invitations for public bidding. Roads, railways, bridges and grain depots have been built mainly with funding from treasury bonds.

Road and Water Transport

The 15th National Congress of the Party set basic objectives of economic growth and social progress and the Ministry of Communications has framed a three phase group of targets for

modernising road and water transport. In **Phase I** the present conditions, with restraints arising from bottlenecks and pressure on the system being generally high, will be alleviated by 2010. In **Phase II** a massive plan to build a national trunk highway system, better waterways, key ports and transport centres and a support system will be fulfilled around 2020. The transport system will achieve ‘basic adaptation’ to the economic goals of the country and its social aspirations by this stage. In **Phase III** the system will reach the level of moderately developed countries and realise modernisation by 2050.

Table 5. China: Road and Water Transportation, (1996-2005)

(Km)

	9 th FYP (1996-2000)	10 th FYP (2001-2005)
Total Road Network	1,400,000	1,600,000
- Expressways	16,000	25,000
New Roads	240,000	200,000
- New Expressways	13,000	12,000
Five North-to-South and Seven East-to-West Trunk Lines	18,000	26,000
Inland Navigable Channels	4,151	7,940

Source: Ministry of Communications

The planned **road network** will create a National Trunk Highway System (NTHS) with five north to-south and seven east-west roads as the core. The network will link together Beijing, all provincial capitals, capitals of autonomous regions and the super-municipalities. All metropolises of over 1 million people will be on the network, as will 93 per cent of those with a population of over half a million. A total of 200 cities will be on the network, which will run to approximately 35,000 kilometres.

Table 6. China: Road Lengths, 1997-2001

('000 Km)

	1997	1998	1999	2000	2001
Total	1,226	1,278	1,352	1,403	1,698
- Expressways	4.77	8.73	11.61	16.29	19.43
- Intercity Roads	1.23	1.26	1.35	1.40	1.43

Source: National Bureau of Statistics

Thanks to growing investment by the government, the 9th FYP planned to build 90,000 kilometres of new roads and actually completed 240,000 kilometres. The national trunk

highway system will be completed by 2008 – 12 years earlier than previously planned. Another priority during 10th FYP is to build a regional trunk highway network and a county road network.

Transport centres and **main ports** are also an important focus of work, so that, for instance, the country will have by 2010 a network of 20 coastal ports and 23 inland ports. They will serve 66 per cent of China's medium or large cities. The national highway network will have in it 45 passenger/freight stations, with most of them due to be completed by 2010. The full network of centres will serve 30 capitals and 81 per cent of the cities of over 1 million inhabitants.

Table 7. China: Investment in Road and Water Transportation, 2001-2005
(RMB Billions)

Roads	970
Coastal Ports	79
Inland Water Transportation	28
Others	7
Total	1,084

Source: Ministry of Communications

Railways

Table 8. China: Major New Railway Projects, 2001-2005

Origin	Destination	Length (Km)
Golmud	Lhasa	1,118
Jiaozhou	Xinyi	301
Nanjing	Haihan	220
Ganzhou	Longyan	228
Tongling	Guichi	67
Suining	Chongqing	147
Wenzhou	Fouzhou	310
Changsha	Hengyang	185
Yongzhou	Yulin	587
Wanzhou	Yichang	420
Beijing	Shanghai	1,300
Shanghai	Hangzhou	202
Hefei	Nanjing	175

Source: National Bureau of Statistics

The railways have become the subject of a huge amount of investment during the 10th FYP aiming at promoting local economic growth. China will spend RMB350 billion (\$42.3 billion) on railway construction during that period to build and upgrade its eight north to-south and eight

east to-west trunk lines, as well as the western railway network. By 2005, China will have 75,000 kilometres of railway track including 7,000 kilometres of lines, 4,000 kilometres of double track, and 5,000 kilometres of electrified railways, all newly built.

China's vast western regions will get priority in railway construction over the next few years, some 2,000 kilometres of track being laid across the region. Local railways will still exist as a complementary part to the state railway system. The preliminary target is to build a new line of 1,000 kilometres with an investment of RMB11 billion.

Urban Construction

The pace of creation of sufficient living space for the growing urban population has particularly accelerated in recent years. The improvement of housing has been running alongside the increasing price for residential houses. Approximately 30 per cent of people live in cities, creating an urban population of 370 million. These figures are estimated to increase to 45 per cent and 630 million by 2020, and to 60 per cent and 960 million by 2050. Assuming the living space per capita is 10 m², China has to build 5.2 billion m² of new housing space for the increased urban population, or 260 million m² every year until 2020. From 2021 to 2050, with an increase of 330 million people, another 6.6 billion m² of new houses will be needed, with an annual increase of new floor space of 220 million m².

Table 9. China: Real Estate, 2001

		%
Floor Space Completed (million m²)	273	16.4
Floor Space under Construction (million m²)	359	27.2
Housing Projects Completed (million m²)	225	19.0
Investment Completed (RMB billion)	624.5	25.3
- Housing Projects (RMB billion)	427.9	28.9
Price of Housing Projects (RMB/m²)	2,226	5.8

Source: National Bureau of Statistics

The small towns will be encouraged to expand infrastructure, housing projects, public works and facilities aiming at providing good living conditions for an agricultural population of 50 million. About 3,000 towns will be able to accommodate populations of over 30,000 each.

Mining Activity

China spent RMB5 billion from 1995 to 2000 in order to improve the technological level in state-owned mines. As a result, the overall productivity in these major mines increased by 38 per cent. Currently, the top four mines only take 10 per cent of the total market share, and the top eight take 13 per cent. The corporate reform has been conducted by all State Owned Enterprises, which either went into bankruptcy or transformed themselves into shareholding companies, while nearly 50,000 small and illegal mines were closed.

The target for 2005 is to enhance the market share of the top eight mines to 35 per cent by raising the total production capacity up to over 500 million tonnes. The existing low mechanization level will be changed. By 2005, nearly 90 per cent of large mines and 60 per cent of medium mines will adopt mechanized mining.

Table 10. China: Coal Production, 1997-2001

(Million Tonnes)

	1997	1998	1999	2000	2001	2002 (estimated)
Coal Production	1,348	1,233	1,110	939	1,089	1,300

Source: National Bureau of Statistics

Water Conservation

The central government invested RMB40.1 billion on water conservation in 2001. RMB462.5 billion will be spent by 2005, of which the central government will make an input of RMB215 billion or an annual investment of RMB44 billion. RMB115 billion will be spent in the northwest region from 2001 to 2005. The largest project in this sector by far will be the massive South-North Water Diversion Project, the first phase of which will call for an investment of RMB155 billion.

Energy Supplies

China's total exploitable hydropower potential is estimated to be 378 million kilowatts, ranking it the largest in the world. To date, only 15 per cent of China's hydropower resources have been exploited, compared with 50 per cent to 90 per cent in developed countries. China plans to

double its hydropower installed capacity during the next 15 years, from 75 million kilowatts in 2000 to 150 million kilowatts by 2015.

MARKET SIZE AND TRENDS

Brief History

It is often asked why the Chinese wheeled loader industry has developed so successfully in contrast to the hydraulic excavator sector, which always struggled to find a significant position for itself until it was transformed by the arrival of international joint venture partners in the early to mid 1990s.

The answer is to be found in the history of the centrally planned economy of the early 1960s. The government at that time decided that investment would be made into the development of wheeled loaders, and not hydraulic excavators which would have absorbed considerably greater resources and technical expertise. As a result wheeled loaders have long been accepted as the major tool for construction in China, with the first units being produced in the 1960s.

The Tianjin Construction Machinery Research Institute and Liuzhou Construction Machinery Plant jointly developed the ZL50 in 1970, and the design was then shared among other SOEs producing wheeled loaders, all of which then developed their own technology. These companies therefore had the historical and technical edge over many of their current competitors, who are now struggling to keep up with advances in design and distribution. From 1985 to 1990, foreign technology and products were introduced through technical licensing agreements, the table below giving key examples.

Table 11. Technical Co-operation with Foreign Manufacturers, 1985-1990

Domestic Manufacturers	Foreign Partner	Models Introduced
CCID	Liebherr	L522, L551
Changlin Co.	Komatsu	WA300-1, WA470-1
Xuzhou Loader Plant	Kawasaki, Gehl	KLD85Z, SL4619
Yantai Construction Machinery Plant	Furukawa	FL90
Shengyang Shanhe Construction Machinery Works	Furukawa	FL330/FL460
Guangxi Liugong Construction Machinery Co., Ltd.	Caterpillar	966E/988B
Xiamen Engineering Machinery Co., Ltd.	Caterpillar	980C
Yichun	Caterpillar	936E

Source: Off-Highway Research and Company Information

Recent Developments

Table 12. China: Sales of Wheeled Loaders, 1998-2002

(Units)

1998	1999	2000	2001	2002
17,058	18,575	22,881	30,397	46,100

Source: Off-Highway Research

The market for wheeled loaders in 2002 at 46,100 units was nearly three times as large as it was in 1995, when demand stood at around 16,000 units. The average growth between 1995 and 2002 was 17 per cent but in the past three years it has accelerated to 36 per cent. There are various reasons for the growth, the most fundamental being:

Continuous investment in infrastructure and proactive financial policies: the national economy has been very encouraging and the recent positive economic performance can be attributed to a proactive fiscal policy, which was introduced after the 1997 Asian financial crisis. The government has made a programme of massive investment during the past few years such as the “Go West” campaign for the western provinces, the Three Gorges Dam, the biggest hydro-electric project in the world, the Qinghai-Tibet Railway, as well as the west-to-east gas transmission project and the west-to-east electricity transmission project.

Flexible payment programmes, and the growth of private purchasing powers: with the increased activity in the expansion of the infrastructure acting as the engine of the economy, an increasing number of private companies and individuals have been attracted to the construction industry. Their ability to gain access to finance will determine whether or not they will be able to buy machines.

In 2000 the national banks launched instalment plans for the purchase of construction machinery, and this encouraged an enormous number of buyers to enter the market. It is now thought that 60-70 per cent of all wheeled loader sales are made to private companies, a proportion that will grow as more central and local banks offer attractive, flexible financing to their customers.

The price war: since 2000 a price war has been waged by the leading manufacturers in an effort to gain greater market share, and volumes, in this rapidly expanding market. On average, the current price of a wheeled loader is some 25-30 per cent lower than it was three years ago,

enabling the customer to enjoy the benefits of both lower pricing, and easy payment facilities from the bank.

Changing working habits. With the increased price of labour, a developing welfare system and increased safety insurance requirements, the cost of hiring workers is now exceeding that of using machines, especially in economically developed areas.

Developments by Horsepower Sector

The majority of the market in China lies with medium sized machines from 100 to 220 horsepower. In order of popularity, the leaders are the ZL50, ZL30 and ZL40, and between them they account for more than 98 per cent of all sales.

Table 13. China: Sales of Wheeled Loaders by Horsepower Category, 1998-2002

Horsepower	1998		1999		2000		2001		2002	
	Units	%	Units	%	Units	%	Units	%	Units	%
Under 40	129	1	45	-	52	-	7	-	20	-
41-100	1,555	9	1,494	8	1,574	7	1,349	4	800	2
101-150	4,542	27	4,625	25	5,673	25	8,476	28	12,400	27
151-200	3,487	20	3,623	20	3,737	16	3,714	12	4,640	10
201-220	7,274	43	8,626	46	11,700	51	16,701	55	28,100	61
Over 220	71	-	162	1	145	1	150	1	140	-
Total	17,058	100	18,575	100	22,881	100	30,397	100	46,100	100

Source: Off-Highway Research

It is immediately noticeable that the market for small loaders under **100 horsepower** now hardly exists at all. The transmissions are outdated and the work rate that they can achieve does not impress potential buyers. Larger machines do not cost proportionately more and 'small, slow and poor at manoeuvring' is not a formula to win customers. The rise from the RMB100,000 price of the small loaders to the RMB200,000 necessary to acquire a basic 210 horsepower loader is not great and as customers have lost interest, so the manufacturers have taken the emphasis of development away from them.

As a result, sales of machines under 100 horsepower have halved in number since 1998 at a time when total demand has more than doubled.

Machines of **101-150 horsepower** (ZL30) ranked second in volume. The ZL30 had been the most popular model in 1995 and 1996 but lost first position to the ZL50 after a decline of 16 per

cent in 1997. Demand started to recover in 1999 and three years later sales were 165 per cent higher. Sales have almost trebled since 1998, and the category has consistently accounted for 25-28 per cent of sales.

In the third largest category, machines of **151-200 horsepower** (ZL40), sales in 2002 were up by 25 per cent over the previous year. However, whilst their volumes have improved, their proportion of total sales have fallen from 20 per cent in 1998 to just 10 per cent in 2002.

The most astonishing growth recently has been seen in the **201-220 horsepower** category, the home of the ZL50. It became the top seller in 1997 and has maintained its leading position ever since, with an average annual growth of 38 per cent. It took 34 per cent of sales in 1997 and surged to 61 per cent in 2002. Even in 1998, when total sales declined by 1,400 units, more ZL50 units were sold than in 1997. All new customers in the industry first choose the model ZL50, contributing greatly to the growth in this category, which accounted for 73 per cent of the sales growth noted in 2002. This is the largest loader that is commonly made with a Chinese engine, so it is the largest model that most private buyers can afford, imported engines pushing the total price of a machine out of their reach.

Sales of machines **over 220 horsepower** are very rare indeed, and account for less than one per cent of total sales. Where sales are made, they are usually expensive imports which are destined for a particular project, although there are a number of domestic manufacturers (Changlin and Zhengzhou Zhenggong for example) that include larger machines in their range.

Regional Sales

There are enormous variations in the regional pattern of distribution; there is a long history of sales being biased to the eastern coastal provinces, and particularly in those where local governments have been investing heavily in local infrastructure and development: most notable of these are **Shandong**, **Jiangsu** and **Henan**, all of which have put roadbuilding and core infrastructure projects at the top of their priorities.

The provinces of **Henan** and **Shanxi** are both coalmining regions, and these have all called for large numbers of wheeled loaders over the years.

The 'Go West' programme has initiated many large projects in the western regions, and **Sichuan** has proved to be very fertile ground for wheeled loader salesmen. In similar fashion **Inner Mongolia** has greatly benefited from government investment.

Table 14. China: Sales Breakdown by Region, 2002

(Units, %)

Region	Sales	%	Region	Sales	%
Shandong	4,000	8.7	Guangdong	1,200	2.6
Jiangsu	3,700	8.0	Yunnan	1,200	2.5
Henan	3,300	7.2	Tianjin	1,000	2.2
Shanxi	3,200	6.9	Hubei	1,000	2.2
Sichuan	3,200	6.9	Hunan	800	1.7
Hebei	3,000	6.5	Jiangxi	800	1.7
Inner Mongolia	2,600	5.6	Heilongjiang	700	1.5
Liaoning	2,200	4.8	Chongqing	500	1.1
Zhejiang	2,000	4.3	Guangxi	400	0.9
Anhui	1,900	4.1	Guizhou	400	0.9
Beijing	1,800	3.9	Jilin	400	0.9
Shaanxi	1,500	3.3	Ningxia	400	0.9
Xinjiang	1,500	3.3	Shanghai	350	0.8
Gansu	1,300	2.8	Qinghai	200	0.4
Fujian	1,200	2.6	Tibet	200	0.4
			Hainan	150	0.3
			Total	46,100	1.0

Source: Off-Highway Research

Beijing has proved to be a particularly important market, with the massive build up of infrastructure for the 2008 Olympic Games, and its host of associated projects.

PRODUCTION

Table 15. China: Production of Wheeled Loaders by Horsepower, 1998-2002

(Units)

Horsepower	1998		1999		2000		2001		2002	
	Units	%	Units	%	Units	%	Units	%	Units	%
Under 40	147	1	43	-	94	-	30	-	50	-
41-100	988	6	1,111	6	1,094	5	1,112	3	820	2
101-150	4,592	26	4,559	24	5,500	24	8,683	27	13,800	27
151-200	3,692	21	3,761	20	3,624	16	4,228	13	5,200	10
201-220	7,910	46	9,155	49	12,308	55	17,980	57	30,600	61
Over 220	55	-	116	1	88	-	47	-	30	-
Total	17,384	100	18,745	100	22,708	100	32,080	100	50,500	100

Source: Off-Highway Research

Before 1980 there were only about 20 plants producing wheeled loaders, but the dramatic increase in market demand during the early to mid-1990s encouraged many more to enter the market; by 2000 there were 120 companies producing wheeled loaders of whom 35 were

manufacturers that solely made this product. Now it is believed that around 90 companies are producing wheeled loaders, and of these, 15 each produce more than 1,000 units a year.

It is important to be able to identify the current key features of the domestic manufacturing industry:

- There is almost no domestic production of machines **smaller than 40 horsepower**, or **over 220 horsepower**.
- Whilst the **41-100 horsepower** sector has maintained its volumes, its share of the total produced has fallen from six per cent in 1998 to just two per cent in 2002.
- The **151-200 horsepower** category has grown in volume by 50 per cent during the period under review, but its proportion of industry output has halved from 21 per cent in 1998 to 10 per cent in 2002.
- The **101-150 horsepower** sector has effectively trebled in size over the last five years, with its percentage of the total industry remaining static at 27 per cent.
- There has been enormous growth in the **201-220 horsepower** sector; since 1998 production have grown from 7,900 units to 30,600, and this single category now accounts for 61 per cent of total industry production.

Table 16. China: Production of Wheeled Loaders by Major Manufacturers, 1998-2002

(Units)

Manufacturer	1998		1999		2000		2001		2002	
	Units	%	Units	%	Units	%	Units	%	Units	%
Xiamen	1,982	11	1,836	10	2,924	13	4,924	15	8,101	16
Guangxi Liugong	2,879	17	2,477	13	2,822	12	3,988	12	7,847	16
Longyan	1,118	6	1,376	7	2,153	9	2,965	9	5,871	12
Changlin	1,367	8	1,388	7	1,377	6	2,245	7	4,194	8
Shandong Linyi	923	5	1,200	6	1,417	6	2,155	7	4,066	8
Xuzhou Loader Plant, XCMG	1,694	10	1,880	10	1,692	7	2,615	8	3,714	7
Shandong Engineering Machinery	1,408	8	1,959	10	1,985	9	2,210	7	3,702	7
Chengdu	1,510	9	1,430	8	1,703	7	2,507	8	3,158	6
Sanjiu Yigong	777	4	841	4	665	3	886	3	1,761	3
Zhengzhou Zhenggong	554	3	548	3	732	3	1,063	3	1,653	3
Others	3,172	18	3,810	20	5,238	23	6,522	20	6,433	13
Total	17,384	100	18,745	100	22,708	100	32,080	100	50,500	100

Source: CCMA & Company Information

A few important trends can be determined from the analysis of production, broken down by manufacturer, for the period 1998-2002.

1. The first is an increase in the percentage that ‘others’ make up in the first part of the period, but after 2000 – the year that the price war started – their output as a proportion of the total has fallen away quite rapidly, and by a total of 10 per cent in the last two years. There is every evidence that smaller manufacturers cannot be as flexible in stepping up production, and cannot compete on price with the leading manufacturers.
2. In 1998 the leading five manufacturers accounted for 52 per cent; by 2002 they accounted for 59 per cent – further evidence of probable consolidation in the industry.
3. **Xiagong**’s policy of aggressive pricing in 2000 enabled it to become the leading manufacturer that year, a position it has maintained ever since.
4. **Liugong**, traditionally the largest manufacturer, lost significant share in the period 1998-2002, but recovered very strongly in 2002, and came within 250 units of Xiagong.
5. **Longyan** has made the most progress of all the manufacturers, in terms of the rate of production increase and its percentage of total output.

Table 17. China: Production of Wheeled Loaders, by Manufacturer and Horsepower Category, 2002
(Units, %)

Manufacturer	Under 100		101-150		151-200		201-220		Over 220		Total	
	Units	%	Units	%	Units	%	Units	%	Units	%	Units	%
Xiamen	92	11	197	1	920	17	6,892	23	-	-	8,101	16
Guangxi Liugong	132	15	1,573	11	1,128	22	5,014	16	-	-	7,847	16
Longyan	-	-	551	4	298	5	5,022	15	-	-	5,871	12
Changlin	235	26	2,608	18	101	2	1,246	4	4	13	4,194	8
Shandong Linyi	-	-	1,168	8	909	17	1,989	7	-	-	4,066	8
Xuzhou Loader Plant, XCMG	115	13	1,379	10	381	7	1,832	6	7	23	3,714	7
Shandong Engineering	122	14	1,795	13	151	3	1,616	5	18	60	3,702	7
Chengdu	-	-	2,154	16	21	-	983	3	-	-	3,158	6
Sanjiu Yigong	30	-	1,299	9	100	2	332	1	-	-	1,761	3
Zhengzhou Zhenggong	46	1	696	5	25	-	886	3	-	-	1,653	3
Others	98	11	380	3	1,166	22	4,788	15	1	1	6,433	13
Total	870	100	13,800	100	5,200	100	30,600	100	30	100	50,500	100

Source: CCMA & Company Information

Xiamen Construction Machinery Group, or **Xiagong**, was founded in 1951 and started making wheeled loaders in 1971. It became listed on the Shanghai Stock Exchange in 1994. In 2000 its production rose from 1,836 to 2,924 and it has been the largest producer ever since. In 2002 it accounted for nearly 17 per cent of all domestic production.

The present range runs from ZL15 to ZL80, with variants for mining, forestry and side discharge. The largest model ZL80 is built under Caterpillar licence. Its five variants of the ZL50 are its core product and take up 85 per cent of the total. The production of other models is much less important, with the ZL40 accounting for 12 per cent and the ZL30 less than three per cent.

Guangxi Liugong Construction Machinery Co., Ltd., or **Liugong**, is located in the south-west of the country, in the Guangxi Zhuang Autonomous Region. As the producer of China's first wheeled loaders in 1966, it has always been a pioneer in terms of production and R&D. In 1993 the company went public. Liugong was the largest producer of wheeled loaders in China until 1999. Production varied between 2,500 and 3,000 units each year in the late 1990s, lower than the peak in 1993. It achieved the highest growth of all manufacturers in 2002, namely 99 per cent and produced 7,800 units, 16 per cent of the total output in this sector.

New assembly lines are currently under construction, and when they are finished in early 2003 the production capacity will rise to 10,000 units per year.

The product range covers all sizes and variants, from 68 to 440 horsepower. The heart of the range is the model ZL50, taking more than 60 per cent of total production, followed by the ZL30 taking 20 per cent, and the ZL40 taking 15 per cent. The fact that the ZL30 has replaced the ZL40 as its second most popular model is very much a reflection of trends in demand throughout this sector.

Longyan Engineering Machinery Plant, or **Longgong**, was founded in 1993 and is a 100 per cent private enterprise. Located in Fujian province, Longgong began production of wheeled loaders with the ZL30 and introduced a ZL50 in 1998. It has grown from a single construction equipment plant into a large group consisting of five member companies, with one in Shanghai and one in Hong Kong. In 2002 almost half the wheeled loader production was from the Shanghai factory.

Though it has been the third largest manufacturer in this sector since 2000, it makes only three models, the ZL50, ZL40 and ZL30. Like Xiagong, it also concentrates heavily on the ZL50 which accounted for 80 per cent of its 2002 output. Longgong's products are characterised by

lower prices, backed up with good quality and services for the client. Even though the market price of loaders is going down, it has retained its position as the industry's most profitable manufacturer.

Changlin Co. started making wheeled loaders in 1976, stayed at around 500 units per year for ten years, and then doubled production by 1990. In 1985 it began a co-operation with Komatsu on the production of certain Komatsu wheeled loaders. Ten years later it began the joint venture **Komatsu Changlin**, also producing wheeled loaders.

Unlike the top three manufacturers, ZL30 is its core product, and here Changlin has a particularly strong market presence. In 2002 it produced 2,600 units in the 101-150 horsepower category, accounting for nearly 20 per cent of Chinese output of that class. The ZL50 accounts for only 30 per cent of its production, or 1,250 units, a direct contrast to the other manufacturers which rely heavily on this class for success in the market.

Xuzhou Loader Plant is part of the **Xuzhou Construction Machinery Group (XCMG)**. Founded in 1949, it began wheeled loader production in the early 1970s, with its first technology licence coming from Kawasaki of Japan in 1985. It has a range of basic models from ZL30 to ZL60 with many variants, and one large model, KLZ95Z, though production of that special type reached only seven units in 2002.

It has most of its production in the ZL50 (1,830 units) and the ZL30 (1,370 units) models, which respectively took 49 and 37 per cent of total production. While it is now a major producer, its increase of 'only' 47 per cent in wheeled loader production in 2002 does not compare well with the industry's average growth of 80 per cent achieved across these two sectors as a whole.

Shandong Engineering Machinery Plant, or **SEM**, was established in 1958 as a collectively owned company. Located in Qingzhou, it is now expanding very fast. Production in 2002 was 3,700 units compared with 1,400 units in 1998, so expansion has been swift. It restructured in 1991 as an SOE and became a member of **Shandong Construction Machinery Group (SCMG)**. The company is now going through the final stages of restructuring into a private company, which will be completed early in 2003.

Its current capacity is 6,000 units per year on double shift, and 3,500 on single shift. It expects to implement much improvements and expansion after restructuring, and has already added compaction equipment and backhoe loaders to its product range. It has a wide programme of

wheeled loaders, from ZL16 to ZL 80. Some 48 per cent of its output in 2002 was of the ZL30 model, and a slightly smaller proportion was of the ZL50.

Shandong Linyi Construction Machinery Co., or **Lingong**, was founded in 1972 and started production of wheeled loaders in the same year. It was first publicly listed in 1994, and as a member of SCMG, the Group held 37.5 of its shares, but recently SCMG sold its holding to an investment company, **Shenzhen Nanfang**, which is very unlikely to focus on construction equipment industry after the acquisition. The core business of wheeled loader production has yet to find a suitable buyer, so there is a certain element of uncertainty at the moment.

In 2002 the company produced just over 4,000 machines, with the 201-250 horsepower category proving to be the most important, accounting for almost half of the total. The balance of production is fairly evenly spread between the ZL30 and ZL40 models.

Chengdu Construction Machinery, or **Chenggong**, started to produce wheeled loaders in the 1970s, and at this time was restricted to manufacturing smaller sizes, the ZL10 and ZL15. From 1994 onwards, it gradually widened its product line by adding hydraulic excavators, compaction equipment and motor graders. In 1999 it introduced the 'F' series versions of the ZL30, ZL35 and ZL50 models, and in 2000 it released 'G' series designs for the models ZL35, ZL50 and ZL60.

In 2002, it produced 3,150 machines, more than double its output in 1998. Its core product is the ZL30 of which 2,150 were produced in 2002, accounting for 68 per cent of output, and placing it next to Changlin in the 101-150 horsepower category with 16 per cent of national production.

Zhengzhou Zhenggong Machinery Group Co., Ltd. converted from the building of heavy machinery to the manufacture of construction equipment in the early 1960s. It used to be heavily dependent on military orders but in the 1990s it moved over to specialising in wheeled loaders. It soon became a major player in this sector, building models in a range that now covers the sizes from 110 to 220 horsepower, the models ZL50 and ZL30 being the most popular.

Output in 1998 was 550 units, and had increased to 1,653 units in 2002.

Sanjiu Yigong Biopharmaceutical and Chemical Inc., or **Sanjiu Yigong**, was formed from the former Yichun Construction Machinery which began to make wheeled loaders in 1972. In 1993 the factory became incorporated and in 1996 floated part of its shares on the Shenzhen Stock Exchange. It has diversified into other products, such as compaction equipment and soil

stabilisers, but the wheeled loader model range, which runs from 100 to 240 horsepower, plays a central part of the company's operations.

Unlike the majority of the other market leaders, this company specialises in the ZL30, 101-150 horsepower class, which accounted for 1,300 units of the 1,760 machines it produced last year.

With the exception of Longgong, all of the manufacturers in the above table are state-owned enterprises (SOEs) or restructured SOEs, and all of them have had a strong historical presence in the market. Alongside them is a strong group of private manufacturers, building loaders in considerable volumes but with only a few years of experience. For example, **Quanzhou Jiande Lidali Construction Machinery Co., Ltd.** claimed that it produced 2,000 units in 2002 which exceeded the output of Zhengzhou Zhenggong and Sanjiu Yigong. Jiande used to supply transmission boxes and torque converters to Xiangong, but then started to produce wheeled loaders with same configuration as those of Xiangong, mainly of the ZL50 size.

There are many other manufacturers with limited production capacity, operating out of small and modestly equipped workshops, and poorly developed distribution. They each typically produce a few hundred wheeled loaders every year, but because of their lack of a national sales coverage tend to have only regional strengths. Burdened with large workforces, SOEs in this group are invariably left with few options, which include either bankruptcy, or if lucky, restructuring.

The rest of the industry lies in truly very small operations, building fewer than 100 units every year; or major construction equipment producers from other sectors that participate very modestly in wheeled loader production, either to broaden their product range or to keep a product line after they have moved their main interest to other sectors.

Komatsu Changzhou Construction Machinery Co., Ltd., or **KCCM**, is an exception, as the first and only joint venture in wheeled loaders in China. Founded in 1995 and located in Changzhou next to its Chinese partner, Changlin Co., Ltd., KCCM has a registered capital of \$21 million, now shared by Komatsu Japan, Komatsu (China) Ltd., Changlin and Sumitomo Corp.

Its produces medium to large models (153-440 horsepower), but such is the ferocity of the current price war the annual production of around 100 wheeled loaders per year has yet not made any money for the company. To make better use of its production capacity, the heavy types of

hydraulic excavator, PC300 and 400 were introduced to the factory, but the production has been below 100 units a year recently.

COMPONENT SOURCING

Contrary to the common practice in western manufacturing, Chinese manufacturers still have a high degree of self-sufficiency in low technology components such as chassis and steel structures, or even more sophisticated ones like axles, transmissions and cylinders. One of the advantages inherited from the planned economy is that certain number of SOEs have numerous machine tools and are well equipped to produce a wide range of components for wheeled loaders.

Table 18 gives the component supply pattern for the major producers of wheeled loaders. In summary, the supply of engines is variable but a majority of producers favour Shanghai Diesel as their main source, with Luoyang, Dongfeng-Cummins (a joint venture of Cummins) and Weifang-Steyr as alternatives. In smaller models, Yuchai is also a major supplier. Cummins and Caterpillar engines from the UK and the USA are rarely fitted, except for the G series which are now gaining favour with customers in spite of their higher prices.

Much the same can be said of other key components, such as axles and transmissions, and hydraulics whose sources are invariably from overseas when fitted to a G series. Here the international manufacturers which have made the most progress include Sauer-Danfoss, Bosch Rexroth, and ZF which has a JV with Liugong.

With more international component suppliers setting up their local offices in China, their distribution and after-sale services are becoming more mature and sophisticated. An increasing number of domestic loader manufacturers tend to co-operate with the leading domestic suppliers of engines, transmissions, and hydraulics if they are using foreign technology, or have joint ventures with overseas partners. In general terms, the choice of overseas or domestic components is mainly dependent on the customer's requirement for quality and his ability to pay. Most manufacturers will be able to update or customise their products with a mix of domestic and imported components.

Table 18. China: Component Sourcing for Wheeled Loaders, 2003

	Changlin	Chenggong	Guangxi Liugong	Longgong	Sanjiu Yigong
Engines	Luoyang, Shanghai, Yuchai, Hangzhou, Dongfeng-Cummins, Weifang-Steyr, Cummins USA	Weifang-Steyr, Shanghai, Perkins, Dongfeng-Cummins	Shanghai, Steyr, Weifang-Steyr, Dongfeng, Tianjin, Dongfeng-Cummins, Cummins USA	Weifang, Shanghai	Yuchai, Wuxi, Shanghai, Dongfeng-Cummins
Transmissions	In house, ZF	In-house	ZF, In-house	Shanghai, Xuzhou	ZF
Hydraulics	Manuli, Parker Hannifin, Qingzhou, In-house	Liuzhou, Chengdu	Bosch Rexroth, Kawasaki	Longyan	Bosch Rexroth, Parker Hannifin
Axles	ZF, Graziano, In-house	In-house, ZF	In-house, ZF	Shanghai	Xuxhou Meritor
Cabs	In- house	In-house	In-house	In-house	
Chassis	In- house	In-house	In-house	In-house	
	SEM	Shandong Lingong	Xiagong	Xuzhou Loader Plant	Zhengzhou Zhenggong
Engines	Shanghai, Luoyang, Weifang-Steyr, Cummins USA, Shanghai-Caterpillar, Dongfeng-Cummins	Yuchai, Shanghai, Weifang	Wuxi, Yuchai, Shanghai, Dongfeng-Cummins, Weifang-Steyr, Caterpillar	Shanghai, Yuchai, Weifang-Steyr, Caterpillar, Dongfeng-Cummins, Cummins USA	Yuchai, Luoyang, Shanghai
Transmissions	In-house, ZF	In-house	In-house	In-house, Hangzhou	In-house (ZL50-series), Outsource (ZL30-series)
Hydraulics	In-house, Komatsu	Qingzhou	Qingzhou, Linhai, Fuzhou	Outsourced	Sichuan Changjiang
Axles	In-house, ZF	In-house	In-house	Xuzhou Meritor	Xuzhou Meritor
Cabs	In-house	In-house	In-house, local outsourcing	In-house	In-house
Chassis	In-house	In-house	In-house, local outsourcing	In house	In-house

Source: Off-Highway Research

FOREIGN TRADE

Exports

Although the potential market in Europe, North American and Japan exceeds 40,000 units, China has so far not succeeded in creating an export volume larger than approximately 200 units per year, representing less than one per cent of production. There are a number of reasons behind this lack of success in overseas markets:

Until recently no manufacturer had the technology to meet the standards of the more sophisticated markets of the USA and Europe, and the Chinese industry had to be content with selling small volumes into the least sophisticated markets in the world. This is changing now that some OEMs' G series have recently received both TUV approval and the CE mark, a vital step forward in their export strategies.

They have been so preoccupied with the soaring domestic market, that they have hardly had time to look abroad. The more astute of them, however, realise that the domestic market will contract in the future, and exports are vital if they are to fill their huge capacities. A number of them are now eyeing the European and North American markets very seriously.

They have failed to develop any form of distribution network, so vital to success. A number of them have started to exhibit at international shows for the first time in 2002, in order to attract overseas dealerships.

The leading manufacturers who are active in exporting are **Liugong**, **Xuzhou Loader Plant**, **Xiagong** and **Changlin**. Because of their less developed product quality, after-sales service, product support and distribution, they have targeted mainly South-east Asia, the Middle East, Africa and Latin America where low prices can play a decisive role. The buying power of those countries is, however, very limited, which has resulted in only very modest success overseas to date.

The commonest form of export is to sell machines to overseas projects either financed by the Chinese government or awarded to Chinese contractors. Most manufacturers lack any form of market information for overseas business. The concept of the exclusive dealership, which has been very well established and developed in western countries, has proved to be an unreachable objective for Chinese manufacturers, so they lack the vital support that local partners give.

Table 19. China: Exports of Wheeled Loaders by Manufacturer, 1998-2002

(Units)

Manufacturers	1998	1999	2000	2001	2002
Guangxi Liugong Machinery	46	27	38	42	120
Xiamen Engineering Machinery	-	55	70	50	20
Changlin	29	17	26	32	61
Xuzhou Loader Plant, XCMG	73	56	32	33	46
Chengdu Engineering Machinery Group	18	28	-	-	8
Shandong Engineering Machinery	-	-	17	10	-
Sanjiu Yigong	10	8	-	2	3
Zhengzhou Zhenggong Machinery	13	2	11	1	-
Xuanhua Construction Machinery	-	-	10	18	20
Others	9	2	22	20	-
Total	198	195	216	190	278
Per cent of Total Production	1.14	1.04	0.96	0.59	0.55

Source: Off-Highway Research and Company Information

Some leading domestic manufacturers have recently been able to set up their own representative offices and find dealers for their products. Dealers from abroad have begun to visit manufacturers and shows held in China such as Bauma Shanghai, and have seen good products. Chinese companies are set to participate in international business shows and try to set up useful contacts. It will nevertheless be a long time before wheeled loaders made in China achieve a real penetration in overseas markets, unless arrangements can be made for overseas manufacturers to badge their products, and sell them through their own international networks.

More likely, it is thought, is for Chinese manufacturers to forge relationships with international manufacturers who are keen to source good quality, well priced machines from Chinese manufacturers. Selling built-up products to international OEMs, which will then badge them and sell them through their own distribution networks, would appear to be a quicker and easier solution for Chinese exports, rather than the development of their own overseas distribution networks.

Imports

Imported wheeled loaders fall into two categories, new and used machines. The volume of both is very small relative to the domestic market. From 1998 to 2002 fewer than 700 units in total were imported, around 450 of them being new. The leading four sources of imported new wheeled loaders are USA, Japan, Korea and Sweden, as may be expected.

Table 20. China: Imports of New Wheeled Loaders by Country, 1998-2002

(Units, \$)

	1998			1999			2000			2001			Jan-Nov 2002			Total 1998-2003
	Units	Value	Average Value	Units	Value	Average Value	Units	Value	Average Value	Units	Value	Average Value	Units	Value	Average Value	Total Units
Japan	42	5,257,349	125,175	42	6,624,730	157,732	45	7,393,013	164,289	38	5,830,318	153,429	49	5,611,542	114,521	216
USA	-	-	-	9	2,198,809	244,312	33	2,742,115	83,094	35	4,577,456	130,784	-	-	-	77
Korea	9	560,474	62,275	20	1,257,110	62,856				12	1,674,919	139,577	10	930,000	93,000	51
Sweden	1	88,835	88,835	6	631,158	105,193	7	1,051,567	150,224	9	1214198	134,911	11	1506637	136,967	34
Germany	-	-	-	-	-	-	2	168,000	84,000	2	323,954	161,977	18	3,097,218	172,068	22
UK	2	156,556	78,278	-	-	-	-	-	-	-	-	-	9	1,627,776	180,864	11
Taiwan	-	-	-	-	-	-	-	-	-	-	-	-	3	322,827	107,609	3
Austria	-	-	-	2	277,058	138,529	-	-	-	1	74,612	74,612	-	-	-	3
Italy	-	-	-	-	-	-	-	-	-	-	-	-	3	220,777	73,592	3
Australia	-	-	-	-	-	-	-	-	-	-	-	-	2	1,027,052	513,526	2
France	-	-	-	-	-	-	1	232,600	232,600	-	-	-	-	-	-	1
Total	54	6,063,214	112,282	79	10,988,865	139,100	88	11,587,295	131,674	97	13,695,457	141,190	105	14,343,829	136,608	423

Source: Chinese Customs Agency and Off-Highway Research

The average price of a wheeled loader made in China ranges from RMB150,000 to RMB600,000, while an imported product of the same capacity costs 1.5 to three times more. Given this huge price gap, imported wheeled loaders have almost been ruled out from contract biddings, and can only rely on business from specialist sectors such as major contracts with very large budgets. It is a very small niche, because of the high price. Furthermore, imported machines usually have high requirements on maintenance, spare parts, fuel and other consumables, which discourage demand.

In summary, it is difficult to imagine imported wheeled loaders ever accounting for more than 200 machines a year, a very small fraction of the future market which will average 50,000 units a year for the foreseeable future.

MARKET SHARES

This sector has always been perceived as being very lucrative, and has recently attracted many new entrants among component suppliers and dealers. However, the competition has always been very intense. When the price war started in 2000, the profitability of most of the market leaders was reduced in the attempt to defend their market shares. Given the legacy from the planned economy, the fall in profitability became a prime motive for the SOEs to improve their volume of production, cost control and distribution structures. They had to restructure in order to compete with new competitors who suffered no similar burden, and if they did not they would be driven out of the business.

Table 21. China: Major Suppliers of Wheeled Loaders and Their Market Shares, 1998-2002

Manufacturer	1998		1999		2000		2001		2002	
	Units	%	Units	%	Units	%	Units	%	Units	%
Xiamen	2,015	12	2,048	11	2,757	12	4,450	15	7,708	17
Guangxi Liugong	2,752	16	2,380	13	2,792	12	3,814	13	7,183	16
Longyan	1,109	7	1,739	9	2,100	9	2,864	9	5,208	11
Changlin	1,347	8	1,423	8	1,448	6	2,272	7	4,061	9
Shandong Linyi	1,010	6	1,181	6	1,361	6	1,643	5	4,061	9
Shandong Engineering	1,374	8	1,890	10	1,950	9	2,208	7	3,232	7
Xuzhou Loader Plant	1,555	9	1,719	9	1,759	8	2,407	8	3,229	7
Chengdu	1,441	8	1,378	7	1,654	7	2,177	7	2,736	6
Zhengzhou	519	3	584	3	731	3	1,047	3	1,613	3
Sanjiu Yigong	803	5	841	5	588	3	835	3	1,494	3
Others	3,133	18	3,392	18	5,741	25	6,680	22	5,575	12
Total	17,058	100	18,575	100	22,881	100	30,397	100	46,100	100

Source: CCMA Statistics and Off-Highway Research

The market is, for all practical purposes, totally in the hands of the domestic manufacturers, who combined have more than 99 per cent of the total market; the imported volumes of around 100 units a year are of little significance. The table below summarises the positions of the market leaders in the period 1998-2002, a time of unprecedented growth and change in the industry.

Given the massive changes in demand that have occurred in the last five years, it is surprising that there has been relatively little upset in the positioning of the 10 largest suppliers of wheeled loaders during that time. The most notable features of the table above are Xiamen's capture of first position in 2001, and last year's dramatic decline in the share of the 'others' category to 12 per cent, from the previous year's level of 22 per cent. This might be seen as the first sign of industry consolidation.

**Table 22. China: Sales of Wheeled Loaders and Their Market Shares,
by Horsepower Category, 2002**

Manufacturer	Under 100		101-150		151-200		201-220		Over 220		Total	
	Units	%	Units	%	Units	%	Units	%	Units	%	Units	%
Xiamen	95	12	160	1	921	20	6,532	23	-	-	7,708	17
Guangxi Liugong	129	16	1,397	11	1,106	24	4,551	16	-	-	7,183	16
Longyan	-	-	536	4	302	7	4,370	16	-	-	5,208	11
Changlin	235	29	2,492	20	112	2	1,219	4	3	2	4,061	9
Shandong Linyi	-	-	1,065	9	988	21	1,995	7	-	-	4,048	9
Xuzhou Loader Plant	121	15	1,240	10	377	8	1,484	5	7	5	3,229	7
Shandong Engineering	108	13	1,565	13	167	4	1,371	5	21	15	3,232	7
Chengdu	7	1	1,912	15	14	-	803	3	-	-	2,736	6
Zhengzhou Zhenggong	44	5	697	6	30	1	842	3	-	-	1,613	3
Sanjiu Yigong	40	5	1,071	9	119	3	262	1	-	-	1,494	3
Others	41	5	265	2	504	11	4,671	17	109	78	5,575	12
Total	820	100	12,400	100	4,640	100	28,100	100	140	100	46,100	100

Source: CCMA Statistics and Off-Highway Research

Xiamen has traditionally been placed behind Liugong in the wheeled loader rankings, but the price war that it initiated in 2000 enabled it to secure market leadership for the first time in 2001. In 2002 it consolidated that position by increasing its share to 17 per cent – closely followed by its old foe Liugong.

The company is particularly strong in the all important ZL50 class (201-220 horsepower), where it has a dominating 23 per cent market share. In other categories its strengths are not nearly so apparent, only securing a third position in the ZL40 class (151-200 horsepower) with 921 units. In the two other horsepower categories in which it competes it surprisingly ranks last in the table's order of merit, underlining the importance of its position in the LZ50 class.

Liugong has traditionally been market leader, and only lost this position to Xiamen after the latter started a vicious price war in 2000. However, the company has fought back with great determination, and has won back its original 16 per cent it secured in 1998, and was only around 500 units behind Xiamen in 2002.

As with Xiamen, Liugong's strength lies in the 201-220 horsepower category, and here it secured 16 per cent of the market; it is market leader in the ZL40 class (151-200 horsepower) accounting for 24 per cent of the sector, and performs respectably in the ZL30 class (101-150 horsepower) with 11 per cent.

Longyan has posted a solid performance during the period under review, increasing its share of the market from seven per cent in 1998 to 11 per cent in 2002.

Again, the secret behind the company's success is its competitively priced ZL50 model, where it is placed the third supplier, accounting for 16 per cent. Unlike other companies, however, its success is severely restricted to the 201-220 horsepower class, and is a weak competitor in the LZ30 and LZ40 classes.

Changlin, in contrast, manages to secure success in a broad range of size categories, from under 100 to over 220 horsepower. Its greatest volumes go into the ZL30 sector, where it accounts for 20 per cent of the market and well ahead of its nearest competitor.

Overall the company has achieved stronger penetration of the total market in the last five years, but its recent nine per cent share was only achieved after several hesitant years in 2000 and 2002.

Shangdong Linyi has performed strongly over the last five years, and improved its position from five per cent in 2001 to nine per cent in 2002. Its strengths are divided between the LZ30, LZ40 and LZ50 classes, and performs well in all of them.

Xuzhou Loader Plant's share of the market has been eroded slightly since 1998, when it accounted for nine per cent of sales, compared with seven per cent in 2002. The company is somewhat unusual in that it competes in the full range of size categories, from under 100 to over 220 horsepower.

Its strongest performance is in the ZL50 class, where it achieves a six per cent market share, followed by its sales to the 101-150 horsepower category where it accounted for 10 per cent of industry sales.

Shandong Engineering (SEM) managed to ramp up its sales in China to 3,232 units in 2002 compared with 1,374 units in 1998, but that improvement has not allowed it to maintain the eight per cent share it enjoyed in 1998. Following a useful increase in share in 1999 to 10 per cent, market penetration has since fallen back to seven per cent.

In summary, the domestic suppliers can be conveniently divided into four groups:

Group 1: This is made up of the three largest manufacturers, **Xiagong**, **Liugong** and **Longgong**, all of whom have been market leaders since 2000, and each has more than 10 per cent of the market. Their combined market share increased from 34 per cent in 2000 to 44 per cent in 2002, with 20,000 wheeled loaders sold between them last year.

For each manufacturer in this group, its share of the business and its leading position will be challenged by the other two, rather than by the other competitors in the market. All of them are currently expanding their production facilities, and their planned combined output for 2003 is 27,000 units. Few have done well in other product sectors to date, but all are trying to diversify. Xiagong and Liugong in hydraulic excavators and Longgong in compaction equipment, but all are still heavily reliant on their success in the wheeled loader market.

Group 2: This sector consists of those manufacturers winning between two and nine per cent of the market and this group has annually taken 45 to 50 per cent of the market since 2000. This is a very unstable part of the market where the number of players and their market shares tend to change constantly. There are about ten of them at present, led by **Changlin**, **Shandong Linyi**, **SEM**, **Xuzhou Loader** and **Chengdu Chenggong**.

Group 3: Here are included about 15 specialist manufacturers of wheeled loaders. They each sell between 50 and 500 units per year, and have a combined market share of three to four per cent. Some are SOEs that have been in the industry for a long time but are now faced with falling market shares; some are private manufacturers with small but increasing sales in certain regional markets, but are unable to compete with the leading suppliers on product quality, R&D, national distribution and after sales service.

Group 4: This last group accounts for the remaining two to three per cent of the market, and consists of manufacturers producing fewer than 100 units per year or building wheeled loaders only on request. There are probably around 60 of these marginal manufacturers still remaining.

In order to stabilise their businesses and expand, manufacturers in the first two groups will either take share from the other two groups (that have only seven per cent share) by providing better customer service, launching new products, building a more sophisticated distribution network, or expanding through acquisition. Without restructuring, mergers, acquisitions or increasing turnover through subcontracting for other companies, most SOEs in groups 2 and 3 will soon go out of business through dwindling profits at a time when personnel costs and fixed overheads remain in place. Private manufacturers in these groups are quite flexible in their approach to both production and employees; as a result they should be able to feel relatively comfortable in their small local or regional markets, and might well be able to survive the industry consolidation that must surely come in the future.

DISTRIBUTION AND MARKETING

Manufacturers, their local branch offices and independent dealers all involve themselves in the marketing of wheeled loaders. In the past the great majority of sales were made directly by the manufacturers themselves, but there is now a strong move toward placing the burden of sales directly onto the dealer. Every company is in the throes of moving the sales function from itself to independent dealers, so it is not possible to determine the proportion of dealer- achieved sales, but it is thought that it must be at least 75 percent at the moment, and this proportion will certainly rise in the near future.

All leading manufacturers have set up representative offices or subsidiary sales companies in every province, mostly in the provincial capital, so that they achieve national coverage; but to achieve this they must always be aided by independent dealerships. The secondary suppliers tend to focus on gaining 50 to 80 per cent country coverage, and try hard to enter new regional markets; then finally the smaller companies which focus on their own regional markets and make little effort to gain a foothold in the rest of the country.

Though the domestic manufacturers have developed their own dealer networks, these dealers are quite different from the international norm. Their main preoccupation is to sell new machines, but only a small percentage of them currently offer a full range of services, such as machine selection advice, the supply of spare parts, maintenance and repair services, and the buying and selling of used equipment.

An interesting point about the relationship between manufacturers and their dealers is until recently the great majority of machines would be shipped to the dealer on consignment, and the manufacturer would only be paid when the machine was sold. This helped to encourage the

dealer to keep up his stock levels when times were good, but did little to help the manufacturer's cash flow. With the advent of the price war things have become very much tighter, and a number of OEMs are now demanding down payment, at least from a certain proportion of their dealers.

Exclusive dealerships as they are known in elsewhere have not existed in China until recently, but things are beginning to change very quickly. The move to independent dealers in the last five years typically resulted in a dealer offering a clutch of competing franchises in the same product category, and it is still common to see large 'equipment supermarkets' outside towns; these would typically offer two or three excavator franchises aimed at different categories of customers, with probably two JV products and a locally sourced machine, up to four domestic wheeled loader marques, with compaction equipment, graders and the occasional crawler dozer franchise all thrown in for good measure.

This practice, however, is changing and there is a strong trend towards manufacturers insisting that a dealer will only stock their brand of wheeled loader (or whatever product might be involved) and the competition must move elsewhere. This move was first initiated by the international JVs, so hydraulic excavators were the first to be affected, but the trend is now well set amongst other products, and certainly wheeled loader.

For joint ventures and foreign companies, sales are organised in a more 'western' way. For example, **Komatsu (China) Co. Ltd.** operates the sales and after sales services of all Komatsu construction equipment in China, either imported or locally made, and 95 per cent of sales are done through the dealers.

Other foreign manufacturers such as **Caterpillar**, **Liebherr** and **Volvo** all have local subsidiaries, based either in Beijing or Shanghai. These three companies, Caterpillar (China) Ltd., Liebherr Machinery Service (Shanghai) and Volvo Construction Equipment (China) Co., Ltd. are in charge of the distribution and marketing through their dealers. All foreign manufacturers seeking to sell directly in China are obliged to establish a wholly owned subsidiary, a representative office being insufficient.

The expansion of the distribution system is the first priority for them. For example, Caterpillar has four independent dealers on the Chinese mainland and many other sub dealers. The dealers undertake sales of Caterpillar products in China and provide after sales services and spare parts to the customers, and of course are not allowed to sell other manufacturers' products.

PRICING

Table 23. China: List Prices of Wheeled Loaders, 2003

(RMB)

Model	Source	Unit Price*
ZL15B	Domestic	110,000-120,000
ZL15C	Domestic	120,000
ZL16D	Domestic	100,000
ZL18	Domestic	120,000
ZL18A	Domestic	143,000
ZL25	Imported	1,120,000
ZL30	Domestic	150,000-200,000
ZL30D	Domestic	150,000
ZL30E	Domestic	160,000-200,000
ZL30F	Domestic	157,000
ZL30G	Domestic	170,000
ZL40	Domestic	230,000-252,000
ZL40B	Domestic	250,000
ZL40D	Domestic	255,000-264,000
ZL40E	Domestic	235,000-240,000
ZL40B	Domestic	260,000
	Imported	1,300,000
ZL50B	Domestic	240,000-270,000
ZL50C	Domestic	220,000-330,000
	Imported	1,500,000
ZL50D	Domestic	250,000-390,000
ZL50E	Domestic	250,000-280,000
ZL50F	Domestic	290,000-448,000
ZL50G/ZLG50G	Domestic	290,000-500,000
ZL60F/G/H	Domestic	380,000-680,000
	Imported	1,700,000
ZL80	Domestic	1,450,000-1,550,000
	Imported	1,900,000
ZL90	Imported	2,200,000
ZL110	Imported	2,800,000
ZL170	Imported	5,500,000

* Base machine without attachments.

Source: Off-Highway Research

Given the comparatively low technical barriers to gain market entry, and the existence of a well-organised and mature component supply industry, the wheeled loader market used to be a very attractive proposition for manufacturers, with profit margins typically ranging from 10 to 20 per cent. Little wonder then that the number of manufacturers increased sharply from 60 in the mid-1990s to 130 by the end of 2000.

Many private construction equipment manufacturers, many of them located in Fujian province, went into wheeled loader production, and free of costs such as investment in R&D, they have been able to enter the market at very much lower prices. **Xiagong**, also located in Fujian province, was the first company to be affected by these new competitors, and its market share fell rapidly from 19 per cent in 1998 to 11 per cent in 1999. It had no choice but to respond in similar fashion, and in April 2000 it lowered its prices by between 20 and 30 per cent, thus triggering the price war which continues today.

Other leading manufacturers such as **Liugong**, **Longyan** and **Xuzhou** were obliged to react accordingly, and every company's profit margin fell by 5 to 10 per cent in 2000. As a result in 2001 the wheeled loader industry showed a 17 per cent increase in turnover, but an 18 per cent fall in profits. The leading 16 manufacturers increased their joint turnover by 25.3 per cent but had to accept the fact that their profits had dropped by 8.9 per cent during the year.

For domestic products, the pricing mechanism largely depends on the configuration of the machine and the number and sophistication of attachments supplied. The final price is also crucially influenced by the ratio of imported components. For example, the most popular model, the ZL50, is sold at between RMB220,000 to RMB275,000. The latest models, such as the G series, have a much higher imported component content, especially engines, hydraulics, axles and transmissions, and their prices are consequently 40 to 60 per cent higher at between RMB350,000 to RMB400,000.

It should be noted that all manufacturers adopt different pricing strategies, and sell the same products at different prices according to the prevailing conditions in regional markets. However, the list prices which appear above are representative across the country, and may attract discounts of between three and five per cent, but seldom more, depending on the nature of the deal in question.

In the broadest of terms, there are five pricing levels:

1. Foreign manufacturers (**Caterpillar**, **Komatsu**, **Volvo** and **Liebherr**), are the most expensive by a considerable margin.
2. Joint venture products (**Komatsu Changzhou**), are cheaper than imports although they are of similar quality, but still more expensive than local products.
3. Leading Chinese manufacturers (**Liugong**, **SEM** and **Lingong**) are up to one third cheaper than the nearest imported equivalent.

4. Other state-owned or restructured manufacturers, even cheaper but sometimes offering questionable quality and customer support.
5. Private manufacturers (such as **Lonyang, Jiande** and many others), the cheapest of them all, but usually only offering regional coverage, a limited range and modest customer support.

When reading the above it should be borne in mind that the average price will probably be midway between the highest and the lowest quoted, and specific models for special applications such as coal mining will carry a higher price tag. Care has been taken not to highlight individual suppliers' prices for commercial reasons.

POPULATION AND END-USERS

Although there is no developed trade in used construction equipment to guide owners as to when it is economically desirable to replace a handling machine, it is obvious that wheeled loaders cannot last for ever, and that the newer models on the market are far better than those sold ten years ago. In respect of useful lives manufacturers say that they design their wheeled loaders to last 8,000 hours before the first major service. The limitation is the need to recondition the engine and that will probably have to happen about the age of ten years.

Table 24. China: Population of Wheeled Loaders by End-User, 2002

(Units)

Building Construction	60,000
Civil Engineering	55,000
Industry	40,000
Roads	34,000
Quarries and Mines	30,000
Municipalities	16,000
Utilities	15,000
Sand And Gravel	7,000
Agriculture, Food Processing	6,500
Forestry And Sawmills	6,500
Total	270,000

Source: Off-Highway Research

Larger loaders are dominated by roads and civil engineering together, that is to say the public works industry. Building construction is a major user if one includes the mixing plants which need loaders to create the materials for new construction and reconstruction. Industry is a massive user, including paper, fertiliser and glass, as well as waste disposal; agriculture is limited

to the large scale processing of crops, as in sugar beet plants, grain mills and so on. The wheeled loader has not made any progress into farms, the nearest that it gets being the yards of the largest state farms.

FORECAST

In the short and medium term, government investment in infrastructure – the heart of China's economic stimulus packages in the past few years – will continue to be the driving force behind the wheeled loader market. Several ambitious schemes, to be financed through bond issues and bank loans, in the future include a gigantic diversion to transport water from the Yangtze River to irrigate the arid Northern provinces, and ambitious pledges to rebuild Beijing for the 2008 Olympic Games. From 2003 to 2005, a total investment of about RMB1,800 billion will be spent on various infrastructure projects including roads, railways, metro systems and water conservancy. All will require wheeled loaders in massive numbers.

Table 25. China: Forecast Sales of Wheeled Loaders, 2003-2007

(Units)

2003	2004	2005	2006	2007
54,000	58,000	55,000	53,000	50,000

Source: Off-Highway Research

Before the end of the 11th FYP period, starting in 2006, it is planned that the growth rate in fixed asset investment will have reached 15 per cent. Approximately 60 to 70 per cent of the investment in fixed assets will be used on construction projects. There are two notes of caution. Many economists are suggesting a fading out of the role of government at all levels in inciting domestic demand. Secondly, the new government has prohibited so-called 'Performance Projects' favoured by many local chief administrators. During their tenure in the local government, they tend to make great investment on buildings, roads, and other infrastructure to burnish their reputations.

Given the commitment of the construction industry to the use of wheeled loaders, it seems probable that low prices will attract even more buyers in the next three years. There is plenty of work on the supply side, and the industry will be keen to sell to potential users. The total production capacity of wheeled loaders in China will reach 60,000 units by 2004.

Two market leaders, Xiangong and Liugong, are currently expanding their production facilities and their combined capacity will have reached 20,000 units within 12 months. While it is highly likely that a few small or medium size manufacturers will go out of business, the total production capacity will still grow. The peak of demand might arrive in 2004, and sales of around 58,000 units can be expected. If any weakness in the market manifests itself, a second price war might well break out and lessen the decline in unit sales.

Few manufacturers are tempted to go into the production of large models above 220 horsepower (ZL60). They feel that reducing tariff duties on wheeled loaders after China's entry into WTO will increase the price competitiveness of large imported machines and make that market unrewarding for them, even though the likely numbers involved in that size class will always remain modest at best.

The competition in the medium size models ZL30 to ZL50 will become more intense among the leading domestic manufacturers. Joint venture and foreign companies will fight continuously in the mini to small, and the large to extra-large categories.

The number of manufacturers participating in the sector will tend to decrease and the phenomenon of the major wheeled loader specialist will disappear. The leaders will try to become full line suppliers, either by acquisition of companies in other sectors, or by developing new products, or by finding foreign partners for new activities.

Rental is less likely to happen in wheeled loaders than in other products in the foreseeable future, given the intense marketing pressure to sell new machines at very affordable prices to users. On the other hand, the wave of sales will certainly create a supply of younger, used machines that can engender growth in the used construction equipment trade, in a way that has not happened in the past.

MACHINES AVAILABLE

In view of the number of private manufacturers it is impossible to list all available models of wheeled loaders in China. The list below details the ranges marketed by the major suppliers.

Table 26. China: Wheeled Loaders Available, 2003

Manufacturer	Model	Engine		Operating Weight (tonnes)	Bucket Capacity (m ³)	Product Source
		HP	Manufacturer			
Caterpillar	902	45	Caterpillar	4.4	0.6	UK
	906	60	Caterpillar	5.0	0.8	UK
	908	82	Caterpillar	6.0	1.0	UK
	914G	90	Caterpillar	7.2	1.2-1.4	UK
	924G	121	Caterpillar	10.3	1.7-5.0	UK
	928G	131	Caterpillar	11.8	2.0-2.2	UK
	938G	160	Caterpillar	13.0	2.1-2.8	Belgium
	950G	180	Caterpillar	17.8	2.5-3.5	Belgium
	962G	200	Caterpillar	18.6	2.7-3.8	Belgium
	966G	235	Caterpillar	22.9	3.2-4.0	Belgium
	972G	265	Caterpillar	25.1	3.8-4.7	Belgium
	980G II	311	Caterpillar	30.2	3.8-5.7	Belgium
	988G	475	Caterpillar	50.2	6.3-7.0	Belgium
	990-II	620	Caterpillar	76.5	8.4-9.2	USA
	992G	800	Caterpillar	93.8	11.5-12.3	USA
994D	1,250	Caterpillar	191.2	19.5-31.0	USA	
Changlin	ZLM15B	55	Shanghai	5.5	0.8	Changzhou
	ZLM18	77	Luoyang	6.6	1.0	Changzhou
	ZLM30	109	Luoyang, Yuchai, Cummins	9.6	1.5	Changzhou
	ZLM30E	125	Luoyang, Yuchai, Cummins	10.0	1.7	Changzhou
	ZLM30E-3	125	Luoyang, Yuchai, Cummins	10.0	1.7	Changzhou
	ZL40B	160	Shanghai	13.2	2.3	Changzhou
	ZLM40E	174	Shanghai	13.6	2.3	Changzhou
	ZLM40B	160	Shanghai	13.2	2.3	Changzhou
	ZLM40E-3	174	Shanghai	13.8	2.3	Changzhou
	ZL50B	209	Shanghai, Hangzhou, Cummins, Weifang-Steyr	16.3	3.0	Changzhou
	ZLM50E	206	Shanghai, Hangzhou, Cummins, Weifang-Steyr	16.3	3.0	Changzhou
	ZLM50E-3G	209	Shanghai, Weifang	16.3	3.0	Changzhou
	ZL50F	205	Cummins USA	16.3	3.0	Changzhou
	ZL60F	240	Cummins USA	18.5	3.5	Changzhou
ZL60F-3	240	Cummins USA	18.5	3.5	Changzhou	
Chengdu Chenggong	ZL20A	85	Shanghai	7.5	1.0	Chengdu
	ZL30B	105	Shanghai	10.0	1.5	Chengdu
	ZL30F	143	Shanghai	13.5	1.7	Chengdu
	ZL35F	143	Shanghai	17.0	2.0	Chengdu
	ZL35G	154	Perkins	0.0	2.0	Chengdu
	ZL40B	170	Shanghai	14.2	2.2	Chengdu
	ZL40E	163	Shanghai	16.2	3.4	Chengdu
	ZLC50B	210	Shanghai	10.9	2.1	Chengdu
	ZL50E	210	Shanghai, Steyr	11.4	3.0	Chengdu
	ZL50F	210	Shanghai, Steyr	17.2	3.1	Chengdu
	ZL50G	211	Shanghai	11.3	3.1	Chengdu
	ZL60G	268	Cummins	20.5	3.4	Chengdu
	China Construction International Development	L522	101	Deutz	9.1-9.3	1.3-1.8
L551B		235	Liebherr	20.9-21.5	3.1-4.5	Tianjin
ZL50III		200	Weifang	16.5	3.0	Tianjin
ZL50C		220	Shanghai, Weifang	16.5	3.0	Tianjin

(continued)

Table 26. China: Wheeled Loaders Available, 2003 (continued)

Manufacturer	Model	Engine		Operating Weight (tonnes)	Bucket Capacity (m ³)	Product Source
		HP	Manufacturer			
Fujian Longgong	ZL30D	120	Yuxhai	10.2	1.7	Longyan
	ZL40	170	Shanghai	12.6	2.0	Longyan
	ZLC40	170	Shanghai	13.3	1.8	Longyan
	ZL50	220	Shanghai, Weifang	16.0	2.7	Longyan
	ZL50-II	220	Shanghai, Weifang	16.0	2.7	Longyan
	ZL50C	220	Shanghai, Weifang	16.8	2.7	Longyan
	ZL50C-II	220	Shanghai, Weifang	16.1	2.7	Longyan
	ZL50E	220	Shanghai, Weifang	16.8	2.7	Longyan
	ZLC50	220	Shanghai, Weifang	17.0	2.5	Longyan
Guangxi Liugong	ZL15C	68	Weifang	5.3	0.8	Liuzhou
	ZL15CII	68	Yuchai	5.3	0.7	Liuzhou
	ZL18A	78	Yuchai	5.8	0.8	Liuzhou
	ZL30E	125	Yuchai	11.2	1.7	Liuzhou
	ZL30F	125	Yuchai	10.8	1.7	Liuzhou
	ZL30G	125	Yuchai	11.2	1.7	Liuzhou
	ZL40A	165	Shanghai	12.8	2.0	Liuzhou
	ZL40B	160	Shanghai	14.5	2.2	Liuzhou
	ZL40G	165	Cummins	13.8	2.3	Liuzhou
	ZL50B	210	Shanghai	16.0	2.7	Liuzhou
	ZL50C	210	Shanghai	17.5	3.0	Liuzhou
	ZL50CX	210	Shanghai, Weifang	17.0	3.0	Liuzhou
	ZL50D	210	Shanghai, Tianjin	17.0	3.0	Liuzhou
	ZL50E	210	Weifang-Steyr	16.2	3.0	Liuzhou
	ZL50F	210	Shanghai	16.2	3.0	Liuzhou
	ZL50G	215	Cummins	16.8	3.0	Liuzhou
	ZL60F	254	Shanghai	19.0	3.3	Liuzhou
	ZL80G	310	Cummins	27.7	4.5	Liuzhou
ZL100C	440	Cummins	42.5	5.4	Liuzhou	
Jinjiang Construction	ZL40	170	Shanghai	12.4	2.0	Jinjiang
	ZL50	210	Shanghai	16.6	3.0	Jinjiang
Komatsu Changzhou	WA320-3	153	Komatsu	12.9	2.3	Changzhou
	WA360-3	153	Komatsu	14.0	2.7	Changzhou
	WA380-3	196	Komatsu	16.4	3.0	Changzhou
	WA380-3SL6	225	Komatsu	17.0	3.3	Changzhou
	WA420-3	224	Komatsu	18.2	3.5	Changzhou
	WA470-3	260	Komatsu	21.6	3.9	Changzhou
	WA500-3	315	Komatsu	27.6	4.5	Changzhou
	WA600	440	Komatsu	45.3	6.1	Changzhou
Sanjiu Yigong	ZL20C	100	Yuchai	7.7	0.8-1.5	Yichun
	ZL20C-II	100	Yuchai	7.7	0.8-1.5	Yichun
	ZL30	120	Wuxi, Yuchai	9.5	1.2-2.0	Yichun
	ZL30/II	120	Wuxi, Yuchai	9.5	1.2-2.0	Yichun
	ZL40E	170	Shanghai	12.7	1.6-2.6	Yichun
	ZL50D	210	Shanghai	12.7	2.0-3.3	Yichun
	ZL50G	220	Shanghai	17.0	2.0-3.3	Yichun
	ZL60G	242	Shanghai, Cummins	17.0	2.4-3.8	Yichun

(continued)

Table 26. China: Wheeled Loaders Available, 2003 (continued)

Manufacturer	Model	Engine		Operating Weight (tonnes)	Bucket Capacity (m ³)	Product Source
		HP	Manufacturer			
Shaanxi Xin Huanggong	ZL05	20	Weifang	1.9	0.30	Huayin
	ZL15B	55	Weifang	5.0	0.80	Huayin
	ZL30	110	Luoyang	10.0	1.50	Huayin
	ZL50C	210	Shanghai	17.6	3.00	Huayin
	ZL50D	210	Shanghai	16.7	3.00	Huayin
Shandong Dezhou	ZL15	65	Luoyang	4.0	0.8	Dezhou
	ZL16	75	Luoyang	4.8	0.9	Dezhou
	ZL30E	106	Luoyang	10.0	1.7	Dezhou
	ZL30F	110	Shanghai	10.0	1.7	Dezhou
	ZL40	175	Shanghai	12.0	2.2	Dezhou
	ZL40F	160	Weifang	12.0	2.2	Dezhou
	ZL50	220	Shanghai	16.5	2.7	Dezhou
	ZL50D	220	Weifang	17.0	2.7	Dezhou
Shandong Engineering	ZL16D	55	Shanghai	4.8	0.8	Qingzhou
	ZL30D	110	Weifang, Luoyang	9.5	1.7-2.8	Qingzhou
	ZL30E	110	Weifang, Luoyang	9.7	1.7	Qingzhou
	ZL30F	110	Weifang, Luoyang	9.7	1.7	Qingzhou
	ZL30F-1	110	Weifang, Luoyang	9.7	1.7	Qingzhou
	ZL40E	158	Weifang-Steyr	12.7	2.2	Qingzhou
	ZL40F	160	Weifang-Steyr	12.7	2.2	Qingzhou
	ZL50D	220	Weifang-Steyr	16.5	3.0	Qingzhou
	ZL50E	217	Weifang-Steyr, Shanghai	17.1	3.0	Qingzhou
	ZL50F	217	Weifang-Steyr	17.1	3.0	Qingzhou
	ZL50G	210	Cummins, Steyr, Caterpillar	16.5	3.0	Qingzhou
	ZL50G-1	210	Cummins, Steyr, Caterpillar	16.5	3.0	Qingzhou
	ZL60F	236	Weifang-Steyr, Caterpillar	19.4	3.3	Qingzhou
	ZL60G	236	Shanghai-Caterpillar	19.0	3.5	Qingzhou
	ZL60H	236	Shanghai-Caterpillar	18.7	3.7	Qingzhou
ZL80D	290	Weifang, Caterpillar	27.0	4.4	Qingzhou	
Shandong Linyi	ZL30F	125	Yuchai	10.8	1.7	Linyi
	ZL30G	125	Yuchai	11.2	1.7	Linyi
	ZL40C	173	Shanghai	12.5	2.0-2.5	Linyi
	ZL40F	173	Shanghai	13.0	2.0-2.5	Linyi
	ZL50B	210	Shanghai, Weifang	16.0	2.7	Linyi
	ZL50C	210	Shanghai	17.5	3.0	Linyi
	ZL50F	210	Shanghai	17.5	3.0	Linyi
	ZL50G	220	Shanghai	17.2	2.8	Linyi
Shenyang Shanhe	ZL40B	170	Tianjin	13.5	2.2	Shenyang
	ZL50B	220	Weifang	17.0	2.9	Shenyang
	ZL50G	220	Weifang	17.0	3.0	Shenyang
	FL330-1	230	Mitsubishi	19.1	3.3	Shenyang
	FL460	300	Nissan	28.5	4.6	Shenyang
Volvo	L50D	75	Volvo	18.1	1.5	Sweden
	L70D	113	Volvo	10.9	1.9	Sweden
	L90D	120	Volvo	14.9	2.6	Sweden
	L120E	165	Volvo	19.1	3.4	Sweden
	L150E	200	Volvo	23.2	4.0	Sweden
	L180E	223	Volvo	26.0	4.8	Sweden

(continued)

Table 26. China: Wheeled Loaders Available, 2003 (continued)

Manufacturer	Model	Engine		Operating Weight (tonnes)	Bucket Capacity (m ³)	Product Source
		HP	Manufacturer			
Volvo (continued)	L220E	260	Volvo	31.0	5.4	USA
	L330E	370	Volvo	50.0	6.9	USA
Xiamen Engineering	ZL15B	60	Longxi, Weifang	5.6	0.90	Xiamen
	XGL30	110	Wuxi, Yuchai	9.6	1.50	Xiamen
	ZL40	170	Shanghai	12.8	2.00	Xiamen
	ZL40D-II	170	Shanghai	12.8	2.20	Xiamen
	ZL50	210	Shanghai	16.3	3.00	Xiamen
	ZL50C	210	Shanghai, Cummins	16.3	3.00	Xiamen
	ZL50C-II	210	Shanghai	16.3	3.00	Xiamen
	ZL50-II	210	Shanghai	16.3	3.00	Xiamen
	ZLC40	170	Shanghai	14.2	1.70	Xiamen
	ZLC40-II	170	Shanghai	14.2	1.70	Xiamen
	ZLC50	210	Shanghai	17.8	2.30	Xiamen
	XGL50	210	Shanghai, Cummins	16.3	3.00	Xiamen
	ZLC50C-II	210	Shanghai	17.8	2.30	Xiamen
	ZLG50C-II	210	Shanghai	16.3	3.00	Xiamen
Xiamen Sanjiale	ZL40	170	Shanghai	12.8	2.00	Xiamen
	ZLJ50	210	Shanghai	17.0	3.00	Xiamen
	ZL50D	210	Shanghai	17.0	3.00	Xiamen
	ZLC50	210	Shanghai	17.8	2.30	Xiamen
	ZLG50	210	Shanghai	17.5	2.90	Xiamen
	ZL50C-II	210	Steyr	17.0	3.00	Xiamen
Xuanhua	ZL30E	121	Luoyang	9.9	1.70	Xuanhua
	ZL50B	210	Shanghai	16.7	2.90	Xuanhua
	ZL50C	210	Shanghai	16.7	3.00	Xuanhua
	ZL50F	220	Caterpillar	16.7	3.00	Xuanhua
	ZL60F	240	Weifang	20.0	3.50	Xuanhua
Xuzhou Loader Plant	ZL30E	115	Shanghai	10.0	1.5-1.7	Xuzhou
	ZL30G	115	Yuchai	10.5	1.7	Xuzhou
	ZL40A	170	Shanghai	12.5	1.7-2.5	Xuzhou
	ZL40E	170	Shanghai	13.0	2.2	Xuzhou
	ZL40G	173	Shanghai	15.0	1.7-2.4	Xuzhou
	ZLC40G	173	Shanghai	15.5	1.7-2.4	Xuzhou
	ZL50D	210	Shanghai	16.0	2.5-3.5	Xuzhou
	ZL50E	210	Shanghai	16.7	2.5-3.5	Xuzhou
	ZL50G	220	Weifang-Steyr, Shanghai, Cummins, Caterpillar	18.0	3.0	Xuzhou
	ZLC50G	220	Weifang-Steyr	19.2	2.3	
	ZL50GH	220	Weifang-Steyr, Shanghai, Cummins	18.0	3.0	Xuzhou
	ZLJ50G	220	Weifang	19.2	-	Xuzhou
	ZL60G	235	Shanghai	20.5	3.5	Xuzhou
ZL80G	300	Shanghai	27.0	4.5	Xuzhou	
Yantai	ZL10	55	Yuchai	4.5	0.5	Yantai
	ZL15	55	Yuchai	5.0	0.9	Yantai
	ZL15E	68	Yuchai	5.0	0.9	Yantai
	ZL18	68	Yuchai	5.7	1.8	Yantai
	ZL30E	115	Luoyang	9.8	1.7	Yantai

(continued)

Table 26. China: Wheeled Loaders Available, 2003 (continued)

Manufacturer	Model	Engine		Operating Weight (tonnes)	Bucket Capacity (m ³)	Product Source
		HP	Manufacturer			
Yituo (Luoyang)	ZL35G	110	Dong Fang Hong	11.0	1.75	Luoyang
Zhengzhou Zhenggong	ZL30E	110	Luoyang	10.2	1.75	Zhengzhou
	ZL40D	170	Shanghai	12.8	2.2	Zhengzhou
	ZL50C	210	Shanghai	17.0	3.1	Zhengzhou
	ZL50D	210	Shanghai	16.5	3.1	Zhengzhou
	ZL50G	220	Shanghai	17.0	2.7-3.0	Zhengzhou
	ZL60D	220	Shanghai	20.8	3.3	Zhengzhou

Source: Company Information

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