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A REVIEW OF 2007, AND FORECAST TO 2012

Table 1. India: Sales of Construction Equipment, 2003-2007

(Units)

	2003	2004	2005	2006	2007	% Change 2006-2007
Articulated Dump Trucks	3	-	5	19	13	-32
Asphalt Finishers	150	115	200	250	265	6
Backhoe Loaders	4,390	6,391	9,133	13,797	21,761	58
Compaction Equipment	1,064	1,110	1,450	2,300	3,219	40
Crawler Dozers	236	312	325	550	627	14
Crawler Excavators	2,530	3,520	4,510	5,895	9,645	64
Mini Excavators	12	1	21	24	10	-58
Mobile Compressors	1,793	1,450	1,147	1,906	2,670	40
Mobile Cranes	1,275	2,410	4,140	5,628	7,333	30
Motor Graders	113	115	185	360	544	51
Motor Scrapers	-	-	-	-	-	-
Rigid Dump Trucks	358	681	784	749	594	-21
Rough Terrain Lift Trucks	-	-	-	3	11	267
Skid-Steer Loaders	73	76	118	168	190	13
Wheeled Excavators	-	1	-	4	5	25
Wheeled Loaders	712	970	1,312	1,870	2,386	28
Total Construction Equipment	12,709	17,155	23,331	33,526	49,279	47
Annual % Change	+22	+35	+36	+44	+47	+47

Source: Off-Highway Research

Table 2. India: Forecast Sales of Construction Equipment, 2008-2012

(Units)

	2008	2009	2010	2011	2012	% Change 2008-2012
Asphalt Finishers	300	330	370	410	450	50
Articulated Dump Trucks	15	15	20	20	25	67
Backhoe Loaders	30,000	37,000	43,000	48,000	52,000	73
Compaction Equipment	4,000	4,800	5,600	6,400	7,200	80
Crawler Dozers	700	775	850	925	1,000	43
Crawler Excavators	14,000	19,000	25,500	32,500	40,000	186
Crawler Loaders	5	5	5	5	5	-
Mini Excavators	25	30	35	40	55	120
Mobile Compressors	3,150	3,450	3,700	3,900	4,100	30
Mobile Cranes	8,400	9,800	11,100	12,500	13,900	65
Motor Graders	750	900	1,050	1,200	1,350	80
Motor Scrapers	-	-	-	-	-	-
Rigid Dump Trucks	725	825	875	925	975	34
Rough Terrain Lift Trucks	50	100	175	275	400	700
Skid-Steer Loaders	300	400	550	750	1,000	233
Wheeled Excavators	20	30	50	80	100	400
Wheeled Loaders	3,200	4,200	5,400	6,800	8,400	163
Total Construction Equipment	65,640	81,660	98,280	114,730	130,960	100
Annual % Change	+33	+24	+20	+17	+14	+100

Source: Off-Highway Research

SUMMARY

A Review of 2007

2007 showed an unprecedented growth in demand for construction equipment in India, with the total market for all equipment types growing by an impressive 47 per cent, peaking at 49,314 units. This reflects the demand being created by continued growth of the economy at around nine per cent, the increase in manufacturing and construction activity at over 10 per cent, and the government's increasing focus on infrastructural development. The surge in construction activity resulted in high demand for key construction equipment sectors, in particular crawler excavators, backhoe loaders, motor graders, compaction equipment and mobile compressors. It may, however, be noted that there has been an all round growth across almost every equipment category, with the exception of dump trucks which have shown a decline. The market for skid-steer loaders has grown but still remains quite small, and with mini excavator demand declining, there is every indication that compact equipment is still losing out to the cheap and abundantly available manual labour in India.

The easy availability of financing from banks and non-banking financial companies (NBFCs) has played a very important role in fuelling the growth of demand for construction equipment. There is huge competition amongst the financing companies, and they are very aggressive in soliciting business. This has resulted in all of them having developed a nationwide network of offices or direct marketing agents (DMAs).

The sustained growth of the Indian economy is also resulting in growing investor confidence, and many international companies are now building manufacturing facilities in the country, either directly or through joint ventures. International manufacturers bring with them the latest technologies and practices being followed in developed economies, which mostly adopt greater mechanisation and more intensive use of equipment. This trend is seen across all industry, and infrastructure development and construction companies are no exception. Furthermore, most of the projects are now being executed on a time-bound basis with bonus and penalty clauses, with minimum equipment requirements being specified at the tender stage itself.

The government is also encouraging private sector participation, as this is an effective means to finance projects, minimise project costs and ensure world class quality construction. This is being done through a programme called Public Private Partnership (PPP), which is increasingly becoming the preferred mode for the construction and operation of infrastructure services such as roads, airports, ports, power, railways, urban infrastructure and telecommunications. Booming

stock markets and government incentives for infrastructure development are also helping construction companies to raise money from the equity markets, thus further fuelling the growth in demand for construction equipment.

The industry had earlier anticipated a continued growth in demand of construction equipment market during 2007, and according to estimates it was expected to be anywhere between 30 to 35 per cent over the levels enjoyed in 2006. However on account of unprecedented demand, the market for a number of products was restricted by limited manufacturing capacity. During 2007 new market entrants included Kobelco, Yanmar and Sumitomo, while most existing suppliers are adding to both their product ranges and their installed capacities.

The Winners: Crawler excavators, a valuable barometer of the total market demand and led by midi and medium sized excavators, grew by 64 per cent and outpaced the market growth as a whole. Backhoe loaders, the mainstay of the construction equipment market in India, also grew by an impressive 58 per cent. Although the growth of skid-steer loaders demand at 34 per cent was sizeable, the volume is still quite small. This, coupled with low demand for mini excavators, indicates that compact equipment is still not replacing manual labour.

Buoyant growth was also observed in motor graders (up 51 per cent), compaction equipment (up 40 per cent) and mobile compressors (up 40 per cent), along with mobile cranes and wheeled loaders that showed valuable growth of 30 per cent and 28 per cent respectively. Marginal growth was observed in crawler dozers and asphalt finishers.

The Losers: Demand for rigid dump trucks fell by 21 per cent, mainly on account of delays in ordering by Coal India Limited, which makes bulk purchases of rigid dump trucks every year for smaller trucks. The demand for larger 85-100 tonne trucks was, however, higher than it was in 2006.

Forecast to 2012

Forecasting future market trends in such a rapidly growing industry is always fraught with danger as a result of the large number of factors that are involved. India's continued economic growth, coupled with the government's focus on infrastructure and planned investments will stimulate market demand; on the other hand there are fears of a global economic downturn on account of the recession in the US which might affect the short to medium prospects of the industry in India.

However, to sustain the growth of the Indian economy at current levels and to encourage foreign direct investment, the government's planned huge investments for infrastructure development in the 11th five year plan will continue to drive the construction equipment market at a very rapid pace. With investment in infrastructure scheduled to touch US\$77 billion in 2008, demand for construction equipment will remain strong, albeit at a lower rate of growth than 2007.

Off-Highway Research sees a high rate growth in total equipment demand of 33 per cent in 2008, which is likely to be followed by slightly slower growth in future, mainly on account of the increase in the market base and equipment population. In the period 2008-2012, the market trend is likely to change from one of a very high growth rate to a more sustainable level of growth of around 14 per cent. All types of equipment will see outright growth, led by hydraulic excavators, wheeled loaders, backhoe loaders, motor graders and compaction equipment; importantly, a shift towards the use of specialist equipment for particular applications may well be expected.

Encouraged by policy changes, such as the reduction of excise duty by two per cent on manufacturing recently announced by the government, equipment manufacturers are expanding their existing production capacities as well as establishing new manufacturing facilities. These actions will result in the improved availability of equipment at more competitive prices, which will in turn result in higher equipment usage. Some of the leading manufacturers are planning to make their Indian facilities into export hubs for the region, and the resultant additional volumes should reduce unit costs.

ECONOMIC TRENDS

Table 3. India: Basic Economic Indicators, 2002-2007*

	2002	2003	2004	2005	2006	2007
Gross Domestic Product (Rs Bn)	22,653	25,494	28,559	32,509	37,174	42,830
Real GDP Growth (%)	7.4	8.1	7.5	9.0	9.4	8.7
Consumer Price Inflation (%)	4.0	3.8	4.6	5.4	7.0	5.5
Industrial Production (%)	5.7	6.0	6.5	7.9	7.9	9.0
Exports (\$ Bn)	52.7	63.5	76.2	102.7	122.0	111.0*
Imports (\$ Bn)	61.4	77.0	83.4	149.2	187.9	168.8*
Trade Balance (\$ Bn)	-8.7	-13.5	-7.2	-46.5	-75.9	-57.8*
Gross External Debt (\$ Bn)	104.9	111.6	133.0	138.1	169.6	190.5**
Foreign Currency Assets (\$ Bn)	71.9	107.4	135.6	145.1	191.9	266.6

*April to December 2007

** End September 2007

Source: Government Statistics

India's economic growth continues unabated with both economic indicators and business confidence at a high level. Growth in the country's gross domestic product has averaged 7.8 per cent during the most recent five year plan (the 10th), the fastest increase to date, and India's GDP crossed the US\$ one trillion mark in 2007 (India is expected to become a US\$2 trillion economy by 2012). Reports suggest India now comes second only to China as a favoured location for global foreign investment, ahead of the USA, Russia and Brazil. Foreign investment, which averaged US\$6.0 billion between 2003 and 2005, topped US\$15.5 billion in 2006 and had reached US\$11.2 billion in the six months ending September 2007.

The Indian economy is still growing at an impressive rate of 8.7 per cent, following annual growth rates of nine per cent in 2005 and 9.4 per cent in 2006. This growth is forecast to continue, and is expected to be fuelled in particular by expansion in the mining, manufacturing, construction and services sectors.

The rupee has continued to increase in value against the dollar, and foreign exchange reserves have soared to over US\$266 billion. This appreciation of the rupee had raised fears of a fall in exports, especially in IT, textiles, handicrafts and automobile components, and this, coupled with higher interest rates, has resulted in lower growth rates in manufacturing. However, the index of industrial production still grew by nine per cent in 2007 and capital goods production grew at 20.2 per cent. The stronger rupee has also resulted in cheaper imports, thus increasing the availability of previously unaffordable, higher quality products, in turn providing a further boost to GDP growth.

Table 4. Growth of Origins of Gross Domestic Product, 2002-2007

(%)

	IX Plan	2002	2003	2004	2005	2006	X Plan	2007
Agriculture and Allied	2.5	-7.2	10.0	-	5.9	3.8	2.5	2.6
Mining	4.0	8.8	3.1	8.2	4.9	5.7	6.1	3.4
Manufacturing	3.3	6.8	6.6	8.7	9.0	12.0	8.6	9.4
Electricity	4.8	4.7	4.8	7.9	4.7	6.0	5.6	7.8
Construction	7.1	7.9	12.0	16.1	16.5	12.0	12.9	9.6
Trade and Hotels	7.5	6.9	10.1	7.7	9.4	8.5	8.5	12.1
Transport and Communication	8.9	14.1	15.3	15.6	14.6	16.6	15.3	-
Financing, Real Estate, Housing	8.0	8.0	5.6	8.7	11.4	13.9	9.5	11.7
Community Services	7.7	3.9	5.4	6.9	7.2	6.9	6.1	7.0
Gross Domestic Product	5.5	3.8	8.5	7.5	9.4	9.6	7.8	8.7

Source: Government Statistics

An analysis of the origins of India's GDP shows that the services and industry sectors are the main drivers of growth, whilst the importance of agriculture is falling annually. Almost all the sectors showed impressive growth in 2007 except agriculture and mining. The government's focus on infrastructure development and an increase in the global demand for steel and ore are also expected to give an impetus to the mining and electricity sub-sectors. Many new coal contracts have been awarded by the government, which are expected to start production in 2008 and these will further stimulate mining growth.

These investments in infrastructure, estimated at US\$494 billion over the next five years, are expected to ensure continued growth, even in the face of fears of a global downturn resulting from the sub-prime crisis in the US. However, inflation has dropped to 5.5 per cent in 2007 compared to 6.7 per cent for the corresponding period in 2006.

CONSTRUCTION AND MINING ACTIVITY

Table 5. India: Projected Infrastructure Investment in 11th Five Year Plan

	10th Plan 2002-2007		11th Plan 2007-2012	
	US\$ Bns	% Share	US\$ Bns	% Share
Electricity (Including Non-Conventional Energy)	71.18	33.10	150.37	30.40
Road and Bridges	35.34	16.50	76.05	15.40
Telecommunication	30.10	14.00	65.12	13.20
Railways	29.18	13.60	62.93	12.70
Irrigation (Including Watershed)	27.20	12.70	54.42	11.00
Water Supply and Sanitation	15.18	7.40	48.57	9.80
Ports	1.00	0.50	18.03	3.60
Airports	1.65	0.80	8.48	1.70
Storage	1.18	0.60	5.46	1.10
Gas	2.13	1.00	5.00	1.00
Total	214.76	100.00	494.43	100.00

Source: Government Statistics

India has been one of the fastest growing economies of the world over the last few years. However, to sustain a growth of over nine per cent per annum, huge investment is going to be required for improving the infrastructure at all levels. Every major sector such as roads, railways, airports, ports, power, irrigation, urban infrastructure, real estate, telecommunication and mining will all require huge development and investment.

The government has planned a major hike of 130 per cent in infrastructure investment in the 11th five year plan (2007-2012) over the previous plan, with net investments of US\$494 billion. The infrastructure investment will reach US\$143 billion in 2011. The total of all sectors' projected investments is US\$581 billion, but of this the government has assumed that 15 per cent will spill over into the 12th five year plan.

Table 6. Budget Plan Outlay by Sector, 2007-2008

(US\$ Billions)

	2007 Budget Estimate	2007 Revised Estimate	2008 Budget Estimate	2008 Budget Growth Over 2007 Revised Estimate	
				Amount	%
Agriculture and Allied Activities	2.1	2.1	2.5	0.4	17.9
Rural Development*	5.0	5.2	5.8	0.7	12.7
Irrigation and Flood Control	0.1	0.1	0.1	0.0	-9.5
Energy	19.3	17.6	22.9	5.3	29.9
Industry and Minerals	5.0	4.4	7.0	2.7	60.6
Transport **	17.5	16.8	20.5	3.7	22.1
Communications	6.3	4.0	5.4	1.3	32.2
Science Technology and Environment	2.2	1.9	2.3	0.4	19.9
General Economic Services	0.9	0.7	1.5	0.7	98.9
Social Services***	19.6	18.3	23.4	5.1	27.6
General Services	0.2	0.1	0.3	0.2	115.8
Grand Total	78.0	71.3	91.6	20.3	28.4

* Includes provision for rural housing, but excludes provision for rural roads

** Includes provision for rural roads

*** Excludes provision for Rural Housing

Source: Government Statistics

An analysis of budgeted investments and their revised estimates show that over 90 per cent of the yearly investments were made in 2007. Budgeted allocations for 2008 show an overall increase of US\$20.3 billion, or 28 per cent over 2007 revised estimates. Major investment increases are destined for infrastructural sectors such as energy, transport (including roads), industry and minerals, and communication apart from social services. This result should give an enormous boost to the construction and mining equipment sectors.

Roads

National Highways Authority of India (NHAI), the apex government body, is implementing the national highway development project (NHDP) in India, which includes projects such as the

Golden Quadrilateral (GQ), North–South and East-West Corridors, ports connectivity, four laning and two laning of other national highways.

NHAI plans to convert a total of 33,097 kilometres of national highways into four laned carriageways, out of which 8,067 kilometres have already been completed and 7,639 kilometres are under implementation. An additional 17,233 kilometres are yet to be awarded for conversion to four lane carriageways. In addition to these, 20,000 kilometres of roads will be upgraded into two lanes and another 1,000 kilometres of express highways have been planned. Furthermore, the development and maintenance of about 41,290 kilometres of national highways is being executed by respective state Public Welfare Departments (PWDs) and the Border Road Organisation (BRO).

Table 7. India: Projected Investment in Roads in 11th Plan, 2007-2012
(US\$ billion)

National Highways	State Roads	Rural Roads Under Bharat Nirman	North East Road Under SARDP	Total
44.3	33.3	10.5	1.4	89.5

Source: Government Statistics

The development and strengthening of highways are also being carried out in almost all states, many of which are also announcing projects in addition to those announced by central government; examples include the 200 kilometre Taj Expressway and the 1,000 kilometre Ganga Expressway announced by the government of Uttar Pradesh.

As road links play a crucial role in rural infrastructure, under the **Bharat Nirman** project, by the end of 2009 every village of over 1,000 people on plains and of over 500 people in hilly and tribal areas will have all-weather roads connecting them to National Highways. The **Special Accelerated Road Development Programme for North Eastern Region (SARDP)** is aimed at two/four laning of 3,251 kilometres of national highways, and two laning / improvement of 4,388 kilometres of state roads in the north eastern region.

Railways

Indian Railways operates one of the largest rail networks in the world, carrying two million tonnes of freight traffic and 17 million passengers daily. In the eleventh five year plan, the Government envisages an increase in these numbers to three million tonnes of freight traffic and

23 million passengers a day, and has planned many projects that include the construction of dedicated freight corridors, the gauge conversion of over 10,000 kilometres, the addition of 10,300 kilometres of new lines and metro rail projects in six major cities.

Table 8. India: Projected Investment in Railways in 11th Plan, 2007-2012

(US\$ Billions)

Rolling Stock	Capacity Augmentation	Safety	PSU Investment	Freight Corridors	Metro Rail	Total
13.3	17.7	27.3	2.7	7.3	5.7	74.0

Source: Government Statistics

Airports

Table 9. India: Projected Investment in Airports in 11th Plan, 2007-2012

	Non Metro	Metro	Greenfield	North East	Total
US\$ Mns	1,500	4,171	3,033	149	8,853

Source: Government Statistics

With passenger and cargo traffic increasing at an average of 20 per cent and 10 per cent respectively, major projects are being undertaken to modernize and expand airports. These include the construction of seven new airports, the modernization and augmentation of capacity at existing airports in major cities, with plans to modernize non-metro airports and the construction of new airports in the North East.

Ports

Table 10. India: Projected Investment in Ports in 11th Plan, 2007-2012

	Major Ports	Minor Ports	Total
US\$ Bns	13.47	7.74	21.21

Source: Government Statistics

India currently has 12 major and 187 minor ports that handle approximately 650 million tonnes of cargo per annum, with a projected capacity set to reach over 1,200 million tonnes by 2012. The 11th plan envisages a capacity addition of 485 million tonnes in major ports and 345 million tonnes in minor ports.

Power

Table 11. India: Projected Investment in Power in 11th Plan, 2007-2012

	Generation	Transmission	Distribution	Total
US\$ Bns	98.4	37.1	41.4	176.9

Source: Government Statistics

The total installed power generation capacity in India currently is over 135,000 MW, but still the peak power demand shortage in 2007 was over 14 per cent. The Government of India has a mission “**Power for All by 2012**”, which requires the increase in generation capacity to 200,000 MW by 2012. Furthermore, all non electrified hamlets and rural households would be provided with electricity through the **Rajiv Gandhi Gramin Vidyutikaran Yojna (RGGVY)**.

Some of the major power projects are Mundra in Gujarat, Sesan in Madhya Pradesh, Krishnapattnam in Andhra Pradesh, and Tilaiya in Jharkhand. There are 45 hydroelectric power projects with an aggregate capacity of 15,000 MW under construction; however the bulk of the potential in Jammu & Kashmir, Himachal Pradesh, Uttarakhand and North Eastern States is yet to be tapped.

Irrigation

Table 12. India: Projected Investment in Irrigation in 11th Plan, 2007-2012

	Major and Medium Irrigation	Minor Irrigation	Command Area Development	Flood Control	Watershed Development	Total
US\$ Bns	43.63	8.64	3.40	2.42	5.94	64.03

Source: Government Statistics

The 11th plan envisages the creation of 16 million hectares of irrigation potential, out of which 5.5 million hectares will come from major and medium irrigation projects, 3.5 million hectares through minor irrigation projects, and 2 million hectares through ground water development. The balance will be through the modernisation of major, medium and minor projects, and the restoration of tanks.

Urban Infrastructure

The US\$12.2 billion, seven year **Jawaharlal Nehru National Urban Renewal mission (JNNURM)** project aimed at integrated development of infrastructure services began in 2006, and is operating in 63 selected cities. The scheme involves total allocation of additional central assistance (ACA) grant to states / union territories.

Madhya Pradesh, Karnataka and the Maharashtra rural water supply projects are all in various stages of construction. The Tiruppur water project is now proceeding after several delays, while some cities including Bangalore, New Delhi, Jaipur and Jalandhar have taken up waste management projects, with private sector involvement.

The Indian real estate industry has been growing at a rate of 20 per cent per annum for the last eight years, and the boom is expected to continue. This will be the result of migration from rural to urban areas, and the subsequent requirement of residential and commercial space, hotels, education and healthcare needs, and the construction of Special Economic Zones (SEZ). The demand will be fuelled by the widespread availability of loans, income tax benefits, and favourable interest rate for buyers and very high profit margins for builders. An estimated US\$150 billion will be invested in this sector in the next five years.

Mining

Table 13. India: Production in Infrastructure Industries 2002-2006

(Million Tonnes)

	2002	2003	2004	2005	2006
Coal and Lignite	367.3	389.3	413.0	437.1	462.0
Crude Petroleum	33.0	33.4	34.0	32.2	34.0
Petroleum Products	104.1	113.5	116.6	119.8	135.3
Iron Ore	99.1	120.6	145.9	154.4	172.3
Finished Steel	35.4	38.6	41.3	44.4	50.2
Cement	111.8	117	125.3	140.5	154.7

Source: Government Statistics

Coal: India has large coal reserves estimated at 287 billion tonnes, of which 115 billion tonnes are proven reserves and 132 billion tonnes of indicated reserves. The demand for coal from April 2006 to March 2007 was 475 million tonnes, and the supply gap was 41 million tonnes. The assessed demand for coal by the end of the 11th five year plan is expected to increase to 731 million tonnes, while supply is expected to reach only 680 million tonnes. Investment of

US\$10.60 billion is expected in the 11th five year plan towards the production, exploration and the modernisation of coal mines.

Metal Ores: India has very large reserves of iron ore, bauxite, chrome and manganese. The demand for metal mining is expected to expand because of the growth in manufacturing and infrastructure sectors. Further entry of global metal manufacturers like Arcelor Mittal, Alcan and POSCO in the Indian metal manufacturing industry will doubtless give a boost to metal mining.

Oil and Gas Exploration: There is a huge gap between the demand and supply of crude oil and natural gas in India. Crude oil demand is 116 million metric tonnes per annum, whereas production of crude oil is only 34 million metric tonnes per annum. The demand for natural gas is 150 million m³ per day while the supply is only 81million m³ per day. The demand for crude oil is expected to increase to 190 million metric tonnes per annum, and demand for gas to 330 million m³ per day by 2012.

EQUIPMENT ANALYSIS

Articulated Dump Trucks: Demand is very small indeed, and has normally been restricted to a couple of areas in India, namely coastal Goa for iron ore mining and in mountainous Himachal Pradesh for hydro-electric power projects and limestone quarries. The market peaked at 19 units in 2006 but fell back to 13 units in 2007.

Generally, small, locally manufactured on-road trucks from Tata or Ashok Leyland with a payload of 10 to 15 tonnes are used on most of the construction sites and quarries in India primarily. These are popular on account of their low purchase price and on-off road capabilities. Where articulated dump trucks are used, the most common sizes are 25, 35 and 40 tonnes.

None of the suppliers are currently actively promoting articulated dump trucks, which are only offered against specific customer requirement. **Volvo** has been the major supplier in the past, while **Komatsu** has also supplied a couple of machines. In 2007, Volvo sold 13 machines of its 35 tonne model to a single customer in Himachal Pradesh, and these were against a total order of 40 machines. The balance of 27 machines will be supplied in 2008, a number that is likely to represent the size of the whole market this year.

Asphalt Finishers: The market fluctuated between 60 and 90 units a year in the mid to late 1990s and consisted mainly of the small wheeled class category, with a paving width of less than

5.5 metres. These tended to be supplied by domestic manufacturers and used primarily for maintenance and upgrading gravel to bituminous surfaced roads.

However, with the establishment of the National Highway Authority of India (NHAI) for developing, maintaining and managing a network of national highways in 1998, a number of large (over 7.0 metres paving width) pavers were imported duty free for priority projects after the first wave of road building contracts was awarded in 1999 and in 2000. These machines were almost exclusively of the crawler type with paving widths of 7.5 to 12.5 metres.

By 2002 demand had reached 174 units and no fewer than 60 imported pavers were sold, but in 2003 sales declined to 150 units. As a result of the general election and a decline in road and motorway contracts, sales fell to 115 units, of which 11 were imported, in 2004. In the last three years a new wave of road and motorway building projects and an increase in road maintenance contracts have once again stimulated the asphalt finisher market. Sales increased to 200 units in 2005, 250 units in 2006 and topped 265 machines in 2007, of which 100 were imported.

The market leader is **Apollo** whose paver range is a very familiar sight on all Indian roads. With 45 per cent of the total market, the company has consistently outsold its competition for many years. Second position is claimed by **Wirtgen Vögele** which is the leading imported brand, and has improved its share to almost 30 per cent of the total market. **Volvo (Ingersoll-Rand)** has lost some ground after the recent acquisition and has a share of seven per cent.

Caterpillar re-entered the market in 2007, and has now established a modest presence in India, as has **Dynapac** (acquired by **Atlas Copco**). Amongst 'others' one should include **Sany** and **Zhenjiang Huachen Huatong**, while PVS Impex is promoting Chinese-made imported machines. There are some other local manufacturers like **Marutti**, **Marshall & Sons**, **Unipave Engineering**, **Speedcraft**, **Conequip** who manufacture and sell small wheeled machines.

In view of the huge planned investments in roads, the future outlook for asphalt finishers is very favourable indeed. Overall, future demand will vary between 300 and 450 units per year and is likely to be divided between small, under 5.5 metre paving width machines, predominantly Indian-made, which will account for about 60 per cent of future demand, used mainly for maintenance of district roads and provincial highways; and large, over 7 metre paving width, imported units, which will be used on national and state highway projects.

Backhoe Loaders: This has been the largest and the fastest growing sector of all in the market, accounting for around 44 per cent of all equipment sales. In 2007 the market peaked at 21,761 units, a growth of 58 per cent over 2006, and ten times the volumes sold in 1998.

The typical backhoe loaders machine sold has an engine of 70 to 80 horsepower, two wheel drive, a side-shift backhoe, and is equipped with a 1 m³ loader bucket and 0.23 to 0.25 m³ backhoe bucket. The demand for larger machines and 4-wheel drive machines is growing, but there is only limited demand for centre-mount backhoes. Although some manufacturers are promoting higher horsepower machines, they are also working on the introduction of machines in the 70 to 80 horsepower range.

Usage of backhoe loaders varies from a utility machine on large construction sites such as roadbuilding, dambuilding and urban infrastructure projects, to hopper / truck loading, trenching, canal and ditch cleaning, general excavation, solid waste management, and even on occasion demolition and mining.

JCB launched its backhoe loaders in India in the early 1980s through its then joint venture with Escorts, and continues to be the market leader with a dominant market share of over 73 per cent. Other manufacturers include **Tata-JD** (nine per cent), **L&T-Case** (nine per cent), **TEREX-Vectra** (six per cent), **Caterpillar** (three per cent). Marginal manufacturers include **BEML**, which recently re-launched its machine, and **Action Construction Equipment (ACE)** which entered the market in 2007. There are no imports, although a few machines have been exported to neighbouring countries.

Demand has been continuously growing for the last six years at a very impressive rate. With rapid urbanisation, GDP growth at over nine per cent and the government's focus on developing infrastructure, the forecast is very bullish indeed: Off-Highway Research forecasts that sales will reach 30,000 units in 2008 and 52,000 units by 2012.

Production capacities are being expanded by most manufacturers, and it may be expected that there will be a number of new entrants looking at the possibility of manufacturing in India in the near future. It should be noted that Foton Lovol Foton of China displayed a machine at Excon 2007 in Bangalore, and Standard Tractors displayed a prototype machine at the Auto Expo 2008 in Delhi.

Compaction Equipment: The last five years have witnessed a strong increase in demand for vibratory and static rollers, with cumulative sales growing by more than 300 per cent reaching

3,219 units in 2007. The simple reason behind this substantial growth has been increasing demand from the road sector. The huge NHDP scheme, and extensive reconstruction works both in urban and rural areas, all require substantial amounts of compaction equipment. The market is dominated by local manufacturers and local companies manufacturing on behalf of overseas companies, while imports are very limited.

Self-propelled rollers, also known as soil compactors, are used exclusively for earth compaction and had sales of 1,579 units in 2007, accounting for 49 per cent of total compaction equipment demand. The most important segment of this market sector lies in the 9.5 to 11.5 tonne class.

L&T-Case and **Volvo** (Ingersoll-Rand) lead the market with a share of 26 per cent each, followed by **Escorts-Hamm** with 21 per cent and **Greaves-Bomag** with 20 per cent. **JCB** also entered the market with its locally manufactured machines last year and sold 23 units. The share of other domestic manufacturers is very small. Amongst imported machine suppliers, **Caterpillar** started selling in 2006, and sold 59 machines in 2007 achieving four per cent share. **Dynapac** (Atlas Copco) has been losing share for some time and sold only eight units of its large 18 tonne machines for airport construction. **Liugong** and **Sany** of China have recently entered the market with their imported mechanical rollers.

Tandem rollers showed a very strong improvement in 2007, with sales at 1,308 units. The sector now accounts for 41 per cent of total demand, a reflection of the huge growth in the construction of asphalt roads. The most important weight class is in the **8 to 10 tonne** range, and is used to compact both the base and the wearing courses. These machines account for 80 per cent of total tandem rollers. The importance of the small, **under 4 tonne** tandem rollers used in roads and footpath maintenance is growing, and in 2007 the market was 242 units or 20 per cent of total tandem sales.

L&T-Case maintains its market leadership with 34 per cent share, followed by **Escorts-Hamm** with 22 per cent having have displaced **Volvo** (Ingersoll-Rand) with 21 per cent from second position. **Greaves-Bomag** sold mostly smaller machines (98 units) and secured a 16 per cent share. Amongst importers, **Caterpillar** leads with three per cent, followed by **Wirtgen** and **Dynapac**.

Pneumatic-tyred rollers (PTRs) have experienced strong growth of 33 per cent because they work closely with tandem rollers in asphalt road construction. However, sales volumes are still low at 72 units in 2007, accounting for only two per cent of the total roller market.

Volvo (Ingersoll-Rand) continues to lead the market with locally manufactured machines with a 42 per cent share, followed by **Wirtgen**, who sold 26 imported units that accounted for a 36 per cent share. They were followed by locally made machines from **Greaves-Bomag**, and imports from **Dynapac**.

The **static** roller market, so popular between the 1960s and the 1980s with annual sales of over 1,200 units, has declined in popularity and now accounts for only eight per cent of total compaction equipment demand. Poorer compaction performance of this roller is compensated by a significantly lower purchase price, simplicity and longevity, and is generally preferred by contractors for small road maintenance jobs. At least 10 domestic suppliers compete in this market, which is dominated by 8 to 10 tonne three-point rollers.

The market forecast for the next few years remains buoyant in view of the huge investment planned for the road sector, and is expected to reach 4,000 units in 2008 and 7,200 units in 2012. Local manufacturers are expected to continue to dominate the market in view of their very competitive pricing.

Crawler Dozers and Loaders: Sales of crawler dozers in the recent past were more or less steady at between 300 and 350 units per year, except for the trough in demand in 2002 and 2003 as a result of reduced orders from Coal India. Demand underwent a remarkable revival in 2006, mainly in line with the growth in mining and road building projects, and reached an historic high of 627 machines in 2007, a growth of 14 per cent over the previous year. Demand for crawler dozers has traditionally been dependent on government purchases, but in recent years there has been a shift in the structure of sales: it is estimated that now some 60 to 70 per cent of sales are being bought by private contractors operating in coal and iron ore mines, and in the construction sector.

Small, **under 100 horsepower** dozers, which account for nearly a quarter of the market, are primarily used in residential, light construction and land development, as well as irrigation projects and agriculture. The medium size crawler dozers, of between **150 and 200 horsepower**, currently account for about 32 per cent of the market and are favoured for road construction and earthmoving applications. The main focus of the crawler dozer business is on large, **over 300 horsepower** machines, which account for about 44 per cent of the market. Sales are predominantly to the mining sectors – coal, iron, limestone – with a growing demand for large infrastructure projects such as the hydro-electric power projects.

BEML, currently the only domestic manufacturer of crawler dozers, continues to dominate the market with a 65 per cent market share. It is followed by **Komatsu** with 13 per cent, **Shantui** with 11 per cent and **Caterpillar** with 10 per cent, all of whom are supplying imported machines. Shantui has gained market share from both Komatsu and Caterpillar in 2007, mainly on account of price. Other suppliers like **Dressta**, **Liebherr**, **Pengpu** and **PromTrac** are also promoting their machines in India.

The government's investment focus on infrastructure and the growth in mining activity will be the main forces behind the forecast eight to 11 per cent per year expansion likely in this sector, with imported equipment, particularly from China and Russia, likely to make strong inroads into the market. Growth is forecast to continue through 2012 when sales are expected to reach a peak of 1,000 units, representing an approximate 58 per cent increase over the next five years.

There is a small demand for **crawler loaders**, particularly for steel mill applications, with **Caterpillar** currently being the only supplier.

Crawler Excavators: This is the second largest of all construction equipment sectors, after backhoe loaders, and one that has been growing at an average of over 37 per cent over the last five years. The buoyant market pushed sales to 9,645 units in 2007, an enormous 64 per cent over the previous year and a growth rate that made it the fastest growing sector in the industry. Very importantly, there is enormous interest from new manufacturers to establish their own production facilities, which will result in significant new capacity being installed in the next two years.

In contrast to the more mature standard excavator sector, demand for **mini excavators** in India has to date remained very modest indeed. Due to the abundant availability of cheap labour, and the overwhelming popularity of backhoe loaders, it is very difficult to promote and sell mini excavators. The machines sold so far have nearly all been in the **2.2 to 5.5 tonne** weight class with only **Tata-Hitachi** selling them with any success. Only 10 machines from all suppliers were sold in 2007, but sales are expected to grow modestly to around 50 units by 2012 as the demand for specialist equipment grows.

In the standard excavator sector, the **18 to 22 tonne** range continues to dominate the market with a growth of 82 per cent over 2006, achieving sales of 5,539 units in 2007, accounting for 57 per cent of total sales. With the growth of urban infrastructure, sales of midi machines in the **6 to 15 tonne** range also showed impressive growth with sales of 2,970 units, an increase of 72 per cent over 2006 and they now account for over 30 per cent of the excavator market. The **22 to**

30 tonne range grew at a relatively moderate rate of 16 per cent to reach sales of 521 units in 2007. Demand for the larger **30 to 50 tonne** machines, generally used for ore mining and in quarries, fell by 18 per cent to 519 units. Meanwhile sales of large, **over 50 tonne** machines more than doubled in 2007 to reach 96 units.

The traditional market leaders continued their dominance in 2007, with **Tata-Hitachi** leading with a 47 per cent market share and 4,493 units. **L&T-Komatsu** followed with 2,914 units and together these two suppliers accounted for more than 75 per cent of total sales. Other local manufacturers include **JCB** and **BEML** who had seven per cent and two per cent share of the market respectively. Other participants include importers, with **Volvo** holding an eight per cent share and **Caterpillar** with three per cent, followed by **Kobelco**, **Hyundai** and **Doosan**. Other suppliers of excavators include **Liebherr**, **TEREX** and the new entrants in 2007 **Yanmar**, **Kobelco**, **Liugong** and **Sany**.

The growth in the excavator market is largely due to the government's focus on infrastructure (roads, railways, and irrigation, amongst others), a strong economy which is growing at its fastest rate in history, enormous growth in mining, and a huge expansion in the volume of construction work being undertaken. This strong pattern of growth is expected to continue with excavators showing the largest rate of growth amongst all construction equipment. The market is expected to grow at 23 to 45 per cent every year, reaching 14,000 units in 2008 and peaking at 40,000 units by 2012. The 18 to 22 tonne sector will remain firmly at the heart of the market, with 6 to 15 tonne midi excavators growing at an impressive rate. The market for large machines is also forecast to grow on account of the long term major growth expected to take place in mining activity.

Wheeled Excavators: These are not very popular because of the limited scope for travelling between job sites, which of course is their main advantage. The difference in price between crawler and wheeled units – usually 15 per cent – and the popularity of backhoe loaders, which are used most often in an excavator mode and offers the mobility of a wheeled excavator, are both factors limiting the wheeled excavator's potential. **Hyundai** was the only supplier in 2007, selling five machines. However, the market is expected to grow modestly on account of the future requirements for specialist machines and through the more active promotion of these machines by manufacturers, and demand should reach 100 units a year by 2012.

Mobile Compressors: The mobile screw compressor market has seen impressive growth in the last two years, and by 2007 the market had grown by 38 per cent compared to 2006 to reach

2,670 units. Growth has been due to the rapid growth in infrastructure, quarrying and mining, coupled with the easy availability of finance.

Sales of mobile compressors **under 400 cfm (11 m³/mn)** reached 1,500 units, or 57 per cent of all units sold in 2007, representing a growth of 36 per cent over 2006. Compressors in the **400-600 cfm** constituted 27 per cent of the total market in 2007, up by 15 per cent over 2006 to reach 705 units. Demand for machines **above 600 cfm (17 m³/mn)** had been decreasing gradually until 2006, but increased by 21 per cent in 2007 to reach 429 units, or 16 per cent of the total market.

Atlas Copco saw its share fall by four per cent to 30 per cent in 2007, even though its sales grew by 24 per cent to reach 802 units in 2007. Its sales, when combined with those of **Chicago Pneumatic** accounted for 54 per cent of the market. Chicago Pneumatic increased its share of the market from 16 to 24 per cent in 2007. **Elgi** improved its market share to 26 per cent in 2007 on account of its strength in water well drilling and mobile compressors over 600 cfm. **Ingersoll-Rand** (now Doosan Infracore) lost market share to Chicago Pneumatic and Elgi. **Kirloskar Pneumatic (KPC)** also saw growth come from water well drilling operations.

Major demand for compressors under 600 cfm is expected to come from mining and quarrying due to the government's focus on infrastructure, and increased construction activity that will require large quantities of raw materials. Growth in demand for mobile compressors over 600 cfm will come from large ongoing projects at shipyards, new airports, increased demand of oil and gas, and government sponsored irrigation and drinking water programmes. The growth in sales is expected to be 16 per cent in 2008 and should reach 3,150 units. From 2009 onwards, the market growth will vary from 5 to 7 per cent per annum to reach 4,100 units by 2012.

Mobile Cranes: Over 90 per cent of all types of mobile cranes sold are accounted for by **pick-and-carry** cranes, with the balance being made up of the **industrial, truck-mounted, rough terrain** and **crawler** varieties. The market has been growing at a phenomenal rate for the last five years, due to the surge in construction activity and a shortage of cheap lifting appliances. The result has been an expansion of the market to 7,333 units of all types in 2007. Even if sales of the popular and cheap pick-and-carry cranes are excluded, demand for conventional cranes increased sharply from 110 units in 2004 to 498 units in 2007.

More than two-thirds of the existing crane population is over 10 years old, and 15 to 25 year old machines are common. They are used in varying applications for general and material handling. There is also strong demand for used cranes imported mainly from Singapore, Japan and the

Middle East, on account of their easy availability and attractive prices; second-hand imports vary between 120 and 250 units in any given year.

Pick-and-carry cranes have a rigid superstructure, as opposed to a revolving one to be found in other crane types, and are essentially material handlers which generally have rated capacities of under 15 tonnes. Some newer models, as the one that has recently been developed by Escorts, go up to 23 tonnes. The market in 2007 was 6,835 units, and is dominated by two major manufacturers, **Escorts** with a 47 per cent share, and **ACE** with 44 per cent. They are trailed at a considerable distance by **Omega**, **Standard** and other small manufacturers.

Industrial or yard cranes, so popular in the 1960s and the 1970s, have not been in great demand in recent years and the market in 2007 was only 30 units. Their market potential is at present very limited, for the areas in which they are most likely to be used (stockyards for example) can now be served by reach stackers or industrial forklifts. **TIL** and **Escorts/Pyare Lal** are the only suppliers to this sector, with models from 12 to 40 tonnes' lifting capacity, with the market being equally split between them.

Demand for **truck-mounted** cranes has increased substantially recently with sales of 152 units in 2007. Excluding the pick-and- carry type, they accounted for 31 per cent of total mobile crane demand. The most popular sized truck cranes are over 40 tonnes, with the focus being on the 70 to 100 tonne lift capacity sectors for use on petrochemical and large civil engineering projects. The demand for machines in the 30 to 50 tonne sector is also growing, with applications from cement plants to power, chemical and fertiliser plants. The market is now dominated by Chinese companies with **Zoomlion** having a 49 per cent share and **XCMG** with 26 per cent, followed by **TIL** with 17 per cent.

Rough terrain cranes are used for general handling in ports and on construction sites, whereas larger 50 tonne machines are used in mining, ports and on large civil engineering contracts. There are offered in sizes from 18 to 120 tonnes' lift capacity, with the focus of the market moving away from the previously popular 20 to 30 tonnes' lift capacity sector, to one of 30 to 50 tonnes. The market peaked in 2006 at 166 units, but fell to 106 units in 2007. **TIL** is the market leader with a 63 per cent share, followed by **Escorts/Pyare Lal** with a 23 per cent share. Other suppliers include **Voltas** and **Tadano**.

Demand for **all terrain** cranes has always been very limited because of their high prices. The sizes vary from 50 tonnes upwards. In 2007 **TEREX Demag**, **Liebherr** and **Grove** were the main suppliers.

The **crawler** crane is the fastest growing segment on account of its higher flotation and stability, grade ability and economical price. The majority of sales are concentrated in the 50 to 80 tonne class, which in 2006 accounted for 75 per cent of total sales, but several cranes with capacities over 100 tonnes have also been sold. **Fushun** from China has captured the market with a 50 per cent share, followed by **Hitachi-Sumitomo** with 16 per cent, and **Kobelco** with 15 per cent. Other suppliers include **Sany**, **Manitowoc**, **Liebherr**, **Terex**, **IHI**, **Zoomlion** and **Sennebogen**.

The outlook for the mobile crane sector remains optimistic in view of the infrastructural development and high level of construction activity. Total demand is expected to grow between 11 to 17 per cent annually, reaching 8,400 units in 2008 and 13,900 units by the end of the forecast period in 2012.

Motor Graders: This market began to develop only after graders had to be included in the tender specifications for national highways. Demand follows very closely the trends of expenditure on new roads, infrastructure development and network maintenance. With an impetus on road development projects, and greater than usual demand from mining companies, sales have grown very rapidly over the last two years, reaching 544 units in 2007, a growth of 51 per cent over 2006.

The market is essentially divided into three horsepower ranges: machines in the **135-165 horsepower** range account for 74 per cent of total demand, and are generally used for road construction and maintenance; the **180-195 horsepower** category accounts for 23 per cent of the market, and these machines are preferred by large road contractors seeking higher productivity, and for haul road maintenance in large construction sites like dams. The balance is accounted for by machines **over 250 horsepower** that are primarily sold to mining companies for the maintenance of haul roads. Only BEML and Tata are manufacturing motor graders in India, with all others being imported.

Caterpillar dominates the market with a 38 per cent share, followed closely by **Komatsu** with 34 per cent. These two market leaders are followed by **BEML** with 11 per cent and **Volvo** with seven per cent. Chinese suppliers have been very active but have been losing market share recently. **Sany** is the most important of them with seven per cent, with others being **Shantui**, **Changlin** and **Liugong**. **Tata** sold 12 machines in 2007 to achieve a two per cent market share.

The forecast for the motor grader market is again very buoyant on account of the large planned investments in roads, power, irrigation and mining projects. There were major delivery constraints in 2007 because of surging global demand, and the result will be a major increase in

retail sales in 2008. It is forecast that this year will see sales increase by 38 per cent to reach 750 units. Subsequently the market should grow between 13 to 17 per cent and peak at 1,350 units by 2012.

Rigid Dump Trucks: This market is almost exclusively confined to the mining sector, and until 1993 was largely controlled by the government. However, private mining companies are now playing a major role in the industry, and are being awarded large mining contracts directly. In contrast, very few off-highway dump trucks are sold to the construction sector, which has traditionally been dominated by on-off highway trucks; their relatively low purchase price and low running costs have made them the preferred earthmoving machine with most general contractors.

Sales of off-highway rigid dump trucks are cyclical and largely depend on the purchasing power of contractors working on government mining contracts. After a peak of 700 machines sold in 1998, the Indian market went into a sharp decline with the market falling to 172 units in 2001. There was a subsequent sharp recovery over the next five years reaching 784 units in 2005, although there was another decline in 2007 to 594 units.

Changes are being seen in the size of rigid dump trucks being sold. Sales in 2007 of small, **21 to 30 tonne** machines showed a decline of 59 per cent in 2007, and at 44 units have decreased to seven per cent of total truck sales. This compares with 213 units, or 31 per cent of sales in 2004. The main part of the market is now largely confined to the **31 to 50 tonne** sector, where sales fell by 30 per cent in 2007 to 394 units. This decline is mainly as a result of delays in ordering by Coal India, the country's largest customer especially for 32 tonne trucks. Sales of 54 tonne trucks reached 30 units, as a result of many cement manufacturers trading up from 45 tonne capacity units.

The **75 to 95 tonne** capacity trucks are primarily used by large coal mining companies as well as iron, copper and zinc mines. This segment enjoyed a growth of 33 per cent in 2007 to 126 units, representing 21 per cent of the total truck market. There was no demand for trucks above 100 tonnes in 2007, but this market is expected to grow in future because of the entry of international mining companies, and their interest will focus heavily on the greater productivity that the larger trucks can deliver.

Most of the rigid dump trucks sold are locally manufactured, with **BEML** being the market leader with 63 per cent, followed by **Caterpillar** with a reduced market share of 25 per cent. **Komatsu** started the domestic manufacture of rigid dump trucks in 2007, and with some

imported units achieved a 10 per cent share in 2007. **Tata** supplied 7 units of locally manufactured Euclid trucks to achieve one per cent share.

To bridge the supply-demand gap and meet the increasing demand for raw materials as a result of infrastructural developments, a major expansion of mining activity is expected. For the future, given its favourable geology, low labour costs and the recent liberalisation of mining and tax legislation, India represents one of the best potential markets for rigid dump trucks in the world. The market is expected to reach 725 units in 2008 and 825 units in 2009, and by then sales of over 100 tonne trucks are expected to have become well established. Subsequently, moderate growth of five to six per cent annually is anticipated with market demand reaching 975 units in 2012.

Rough Terrain Lift Trucks: The concept of the rough terrain lift truck has never been popular; lifting and handling work on building and construction sites has always been done by cheap alternatives including the competitively priced pick-and-carry cranes which are made locally, whilst farming still relies heavily on a manual labour. In 1993 JCB launched its locally made three tonne telescopic machine, but its sales were disappointing and the product was withdrawn in 1999.

The only supplier to the market has been **JCB**, with the company reintroducing the machine in 2006 and selling 11 units in 2007. The machines are being used in ports, railways and industrial plants.

Although no other company is actively promoting the product, there is keen interest amongst some manufacturers. Greater promotion by suppliers, the better availability of construction materials like ash bricks, the wider use of pallets, the greater mechanisation of construction and the increasing cost of manual labour should all give a boost to the market. Demand as a result should expand to reach 50 units in 2008, and might well be as much as 400 units by 2012.

Skid-Steer Loaders: With the easy availability of cheap manual labour, locally produced small tractors and the overwhelming popularity of backhoe loaders, it is very difficult to find many suitable applications for skid-steer loaders in agriculture, industry or construction. However, in the last few years sales have increased, with interest coming from glass and sugar cane factories, waste management, municipalities, road sweeping and construction, and the Indian Army. Sales in 2007 increased by 34 per cent to reach 225 units.

Bobcat (Doosan Infracore) remains the leading supplier, achieving a market share of 67 per cent with sales of 150 units, followed by **JCB** with 26 per cent and **Terex Vectra** with its locally manufactured machines at eight per cent. **L&T-Case** did not sell any machines in 2007.

The points in favour of the machine are its versatility, its size and the fact that it can be easily transported from site to site. Its price is competitive and with the versatility of its attachments making it a very productive machine, one can expect strong market growth. The market is expected to achieve annual growth of over 30 per cent, and should achieve sales of 1,000 units by 2012.

Wheeled Loaders: The market has been growing at an average annual rate of 34 per cent for the last five years. Sales of 2,386 units in 2007 were more than triple the number sold in 2003, when demand stood at only 712 units. This growth has been achieved mainly on account of the economic reforms and the expansion of private contractual work, particularly in the mining and quarrying sectors, and infrastructural investment.

Most demand for wheeled loaders is in the medium, **100 to 150 horsepower** class, fitted with a 1.7-2.0 m³ bucket, a sector that accounted for 78 per cent of the market with sales of 1,865 units. This compares with 85 per cent of total sales in 2006. Sales in the **150 to 250 horsepower** class have substantially increased in the last two years, largely as a result of the rapidly growing popularity of imported Chinese machines. This size of machine is mostly used by private contractors operating in iron ore, limestone and marble quarries, and the 495 units sold accounted for 21 per cent of the total market in 2007. Finally, sales of large production machines **over 300 horsepower** are very small indeed, and account for one to two per cent of total sales.

The wheeled loader market is one of the most competitive in the Indian construction equipment industry, and to some extent this is a result of the recent surge of imports from China that are being sold at prices 30 per cent lower than the competition.

The wheeled loader market is dominated by the domestic manufacturer **Caterpillar-Hindustan**, which does particularly well in the core 100 to 150 horsepower class, leading the market with a 38 per cent share. **Tata** had the second highest share with 19 per cent in 2007, closely followed by **JCB** with 18 per cent... This is followed by imported machines led by Chinese companies, Liugong (eight per cent), **BEML-Xiamen** (five per cent) and **XCMG** (four per cent). **Volvo** (three per cent), **Changlin** (two per cent), **Komatsu** (two per cent) and **Hyundai** were the other importers.

The forecast is encouraging, and government investment into infrastructure should benefit the material production sector of construction which is bound to grow, and will require increasingly competitive and reliable equipment. The mining and quarry sectors should also do well, and investment into the required equipment should be at a healthy level. Industry is re-equipping itself, and with the better availability of supply, the forecast is very positive indeed. Sales are expected to grow at an annual rate of 24 to 34 per cent, and to reach 8,400 units in 2012.

INTERNATIONAL PERSPECTIVES

Sales

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, equating 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 volumes are now four times as big as in 2003. In the longer term backhoe loader demand 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.

Table 14. 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

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.

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.

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 15. 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.