A MULTI-CLIENT STUDY

The construction equipment industry in THAILAND

SEPTEMBER 2014

Off-Highway RESEARCH

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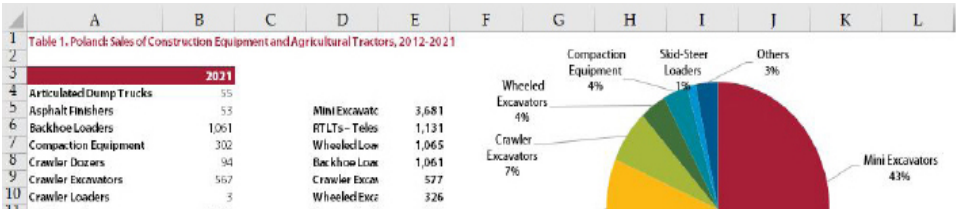

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INTRODUCTION

This report on the construction equipment and agricultural tractor industries in Thailand is an update of the study published by Off-Highway Research in 2011.

Following 15 years of relative stagnation, the construction equipment market finally embarked on a significant growth trend in 2010, stimulated by the Thai government's announcement of a massive fiscal stimulus package aimed at regional infrastructure projects. In addition, damage repair works and water management projects implemented in the wake of the devastating floods that inundated much of the country from July 2011 to January 2012, precipitated unprecedented growth in hydraulic excavator and wheeled loader sales in 2012 and 2013. However, continuing political and economic turmoil, culminating in a military coup in May 2014 and the ousting of the incumbent Prime Minister, Yingluck Shinawatra, have resulted in an abrupt loss of business confidence and a collapse in demand in some product sectors of up to 45 per cent during the first half of 2014.

The aim of this report is to present a concise overview of the development of the various construction equipment sectors in Thailand since 2011, assessing the major changes which have taken place, and those which are likely to occur by the year 2018.

Following an initial period of desk research and discussions with the world's leading construction equipment manufacturers, Off-Highway Research undertook an in-depth field research programme in Thailand in May 2014. This covered all importers of construction equipment and agricultural tractors of any significance and the local manufacturers.

Off-Highway Research would like to record its deep appreciation to all those who assisted in the compilation of this report.

The report follows the usual format of a typical Multi-Client Study from Off-Highway Research, which has been developed with an emphasis on clarity. The coverage is organised as follows:

- The first section includes important topics of a general background nature, such as the political and economic history, current economic activity including construction and prospects for both that industry and the general economy. The conclusions apply to all the product areas and are therefore not repeated in each analysis.
- The second section covers 15 construction equipment sectors and agricultural tractors. For each category the following information is given:

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- Market Size and Trends, 2009-2013
- Domestic Production, 2009-2013
- Market Shares
- Population of Machines and End-Users, 2014
- Sales Forecast, 2014-2018
- Machines Available in Thailand, 2014

- The section of Company Profiles gives comprehensive profiles of the local manufacturers of construction equipment, with details given under the following headings:

- Address
- Component Sourcing
- Distribution and Service
- Domestic Sales
- Exports
- Future Developments
- History and Structure
- Joint Ventures
- Key Personnel
- Licences
- Manufacturing Facilities
- Personnel
- Production 2009-2013
- Product Range
- Turnover

- The second section gives comprehensive profiles of the leading importers of construction equipment and agricultural tractors, with details given under the following headings:

- Address
- Employees
- Franchises
- Future Developments
- History and Structure
- Key Personnel
- Outlets
- Sales 2012-2013
- Turnover

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ABBREVIATIONS

Table 1. Thailand: Main Abbreviations

Abbreviation	
AAY	Airport Authority Of Thailand
ARD	Accelerated Rural Development Department
BMA	Bangkok Metropolitan Authority
CNS	Council of National Security
DOH	Department Of Highways
EGAT	Electricity Generating Authority Of Thailand
ETA	Expressway and Rapid Transit Authority
HP	Horsepower
MEA	Metropolitan Electricity Authority
MRT	Mass Rapid Transit
PBW	Public Works Department
PEA	Provincial Electricity Authority
PWA	Provincial Waterworks Authority
RFD	Royal Forest Department
RID	Royal Irrigation Department
RTA	Royal Thai Army
SRT	State Railways Of Thailand
THB	Thai Baht
WD	Water Department

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SUMMARY OF MARKET ANALYSES

This section summarises the statistics and trends of the 15 product lines to be found in the individual Equipment Analyses that follow.

SALES

The five years leading up to 2010 were a period of relative instability in political and economic terms, and the outlook for suppliers appeared bleak as buyers in the public and private sectors remained deeply cautious about implementing new machine purchases. However, the Thai government's announcement in 2010 of a Bt1.4 trillion stimulus package, named Thai Khem Khaeng, aimed at regional infrastructure projects and land preparation for large scale economic crop plantations, finally provided the impetus and reassurances that the market needed.

Having remained relatively stable in the previous four years, sales of crawler excavators rose by 76 per cent in 2010 to reach their highest level for 15 years. Other product sectors also witnessed renewed investment, albeit at a much lower level than the excavator sector, as owners finally found the confidence to replace ageing machinery fleets.

Strong economic growth and buoyant activity in the construction industry encouraged further machinery purchases in the first half of 2011, but the onset of devastating floods in July, which inundated 65 of the country's 76 provinces for nearly six months, resulted in an immediate collapse in the economy and a resultant stalling in sales of construction equipment. The government's implementation of wide-ranging flood defence projects and huge scale flood damage reconstruction operations in 2012, however, precipitated extraordinary and unforeseen growth in demand for crawler excavators, up by 80 per cent, and for wheeled loaders which increased by 160 per cent.

In the second half of 2013 further political turmoil and increasingly violent clashes between opposing groups of political protestors in Bangkok that threatened to spiral out of control, led to renewed concern about an impending recession. The postponement and cancellation of many mega-infrastructure projects outlined in the Thai government's THB2.2 trillion stimulus package soon followed, and demand for new construction equipment stalled abruptly during what should have been the main buying season in the last quarter of 2013. Vast stocks of new excavators, ordered in anticipation of forthcoming infrastructure projects, continue to lie unsold in dealer yards halfway through 2014.

The Thai economy contracted by 2.1 per cent in the first quarter of 2014 in response to declining investor confidence and what seemed to be a political impasse. The subsequent military coup in May, and the overthrow of the ruling Pheu Thai party

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initially served to intensify the crisis and in the first half of 2014 sales of the two main product sectors, crawler excavators and wheeled loaders, have plummeted by up to 45 per cent.

Recent assurances by the ruling military administration, the National Council for Peace and Order (NCPO), that it intends to schedule parliamentary elections for October 2015 and implement many of the infrastructure projects abandoned by the outgoing government, in an attempt to revitalise economic growth, have nevertheless done much to alleviate the mood of pessimism pervading the industry. Indeed, many of the dealers interviewed for the purposes of this study felt that demand for crawler excavators could exceed 5,000 units within three years, under the strict proviso, of course, that political and economic stability can be maintained.

One of the most salient features of the Thai market's development during the last two years has been the trend towards the purchase of new machines in preference to used equipment imported from Japan. In the wheeled loader and mobile crane sectors, in particular, much of the growth in sales is the result of the declining availability and rising prices of used Japanese equipment, coupled with the influx of cheap new machines from China. Many contractors are now opting to buy new Chinese machines rather than paying a similar price for the equivalent used machine from Japan, or three times the price for a new machine from a Western supplier.

Table 2 Thailand: Sales of Construction Equipment and Agricultural Tractors, by Type, 2009-2013 (Units)

	2009	2010	2011	2012	2013
Asphalt Finishers	4	5	3	10	7
Backhoe Loaders	160	175	185	276	278
Compaction Equipment*	215	234	222	303	315
Dump Trucks	-	8	5	14	41
Crawler Dozers	22	60	36	42	46
Crawler Excavators	1,520	2,680	2,713	4,897	4,117
Crawler Loaders	-	-	-	-	-
Mini Excavators	75	100	750	771	1,064
Mobile Compressors	138	155	100	210	220
Mobile Cranes	47	75	160	225	364
Motor Graders	41	72	50	76	100
Skid-Steer Loaders	9	14	10	22	23
Telescopic Handlers	50	75	60	80	77
Wheeled Excavators	21	33	12	33	24
Wheeled Loaders	129	199	365	948	1,276
Total Construction Equipment	**2,431**	**3,935**	**4,671**	**7,907**	**7,952**
Agricultural Tractors	24,700	22,550	24,400	26,900	22,400

* Ride-on types only
Source: Off-Highway Research

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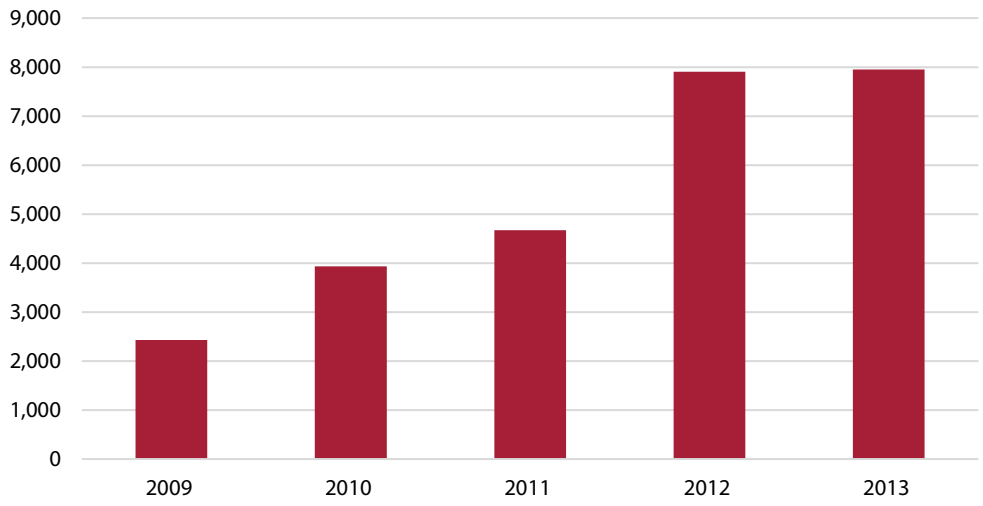
Chart 1. Thailand: Sales of Construction Equipment and Agricultural Tractors, by Type, 2009-2013 (Units)



Source: Off-Highway Research

Likewise, the mini excavator sector has been the subject of a revolution in terms of buying behaviour. This sector has been characterised for many years by the presence of used equipment from Japan, but the advent of a massive promotional campaign by Kubota, which has embraced television advertising as well as widespread customer education programmes and highly flexible leasing schemes, has encouraged many contractors to transfer allegiance from used machines to new ones.

ASPHALT FINISHERS

Increasingly stringent specifications for road building have encouraged a trend towards the purchase of new, high technology pavers from Western suppliers and away from lower specification used machines imported from Japan. The market for used pavers still equates to an annual demand of 20-30 units, although this sector has moved in favour of fully refurbished machines from the European manufacturers' factories.

BACKHOE LOADERS

The market progressed to a peak of 233 units in 2013 as the result of a large government tender, although demand has not developed to the same extent as heavy machinery during the last five years. It now appears the market will stabilise at around 200-250 units per year for the short to medium term at least.

COMPACTION EQUIPMENT

This market is traditionally very stable due to the regular machine replacement programmes of the specialist road building companies. Single drum soil compactors constitute nearly 90 per cent of the demand for new rollers, and most of these products are sourced from low cost manufacturing locations to challenge the

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products available from used equipment sources. Almost all the units sold in 2013 were in the 10 to 11 tonne category. Sales of new tandem rollers are relatively low and restricted to 7-8 tonne models.

CRAWLER DOZERS

Sales have not recovered to any significant extent more than 15 years after the Asian Financial Crisis. The only two years of note have been 2005, when 50 units were sold and 2010 when the market was bolstered by a large government tender of around 30 units. The bulk of demand today is concentrated in the 130-200 horsepower class. Sales of dozers above 250 horsepower are bought by the lignite mines, and in recent years several machines up to 600 horsepower have been sold to Thai contractors operating in the gold mining sector in neighbouring Laos.

CRAWLER LOADERS

It has been impossible to find any buyers at all willing to spend money on a new machine, and no sales have been recorded during the period under review.

DUMP TRUCKS

Sales of articulated trucks are very limited and the few units sold in the last five years have all been to the mining sector or for dam construction projects. The bulk of rigid truck sales are of 100 and 55 tonnes' capacity, which are the preferred sizes for use in the lignite and gold mining sectors.

HYDRAULIC EXCAVATORS

The market has improved dramatically since 2010 and reached an historical record of 4,900 units in 2012. Demand has primarily been underpinned by investment in infrastructure projects, and by a massive programme of flood defence projects following the floods that inundated the country in 2011-2012. The 20-21 tonne size of crawler excavators account for approximately 80 per cent of sales, although there is evidence to suggest that some users are moving to smaller machines of 8-13 tonnes due to their lower operating costs, greater versatility and ease of transportation. Sales of wheeled excavators average 30-35 units per year, although some suppliers believe this market will develop more strongly in future as inner city construction projects come on stream.

MINI EXCAVATORS

The usage of mini excavators in Thailand had always been very low due to competition from plentiful and cheap manual labour. In recent years, however, the rising cost and declining availability of immigrant labour has seen an explosion in demand for the product, a trend stimulated in large part by the highly successful marketing campaign of Kubota, which now commands a market share of 90 per cent. Sales are concentrated in the 3.5 and 5 tonne classes.

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MOBILE COMPRESSORS

Sales of new mobile compressors picked up in 2012 and 2013 to 220 units but demand remains very limited due to the almost universal use of hydraulic breaker attachments on crawler excavators.

MOBILE CRANES

Much of the growth witnessed in 2012 and 2013 is attributable to the arrival of Chinese manufacturers who have appointed dealers with extensive experience of the crane rental and used crane sectors. The private sector traditionally buys used cranes from Japan, Malaysia, Singapore and Taiwan, a market that is estimated to be in the region of 1,200 units per year.

MOTOR GRADERS

The widespread requirement for infrastructure projects has sustained a healthy level of demand for new motor graders during the period under review. Government tenders account for a significant proportion of business, although the private sector road building specialists also invest in regular fleet replacement programmes. The most popular graders are in the 185 horsepower class and, to a lesser extent, the 145 horsepower class.

SKID-STEER LOADERS

Sales remain at negligible levels due to competition from cheap manual labour and used compact wheeled loaders imported from Japan. Agriculture, a potential application for the product, does not have access to finance and the concept has not been accepted by Thai farmers. The few skid-steer loaders sold are generally made to foreign companies with previous experience of the machines. A small volume of second hand skid-steer loaders from China are also imported every year.

TELESCOPIC HANDLERS

The French manufacturer Manitou introduced the telehandler concept to Thailand in 1999 and its dealer operates a large rental fleet that has given wide exposure to the product in a variety of end-user applications. The product is subject to competition from the plethora of used rough terrain cranes operating throughout the construction industry, although a stable volume of sales is maintained each year.

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SALES BY MANUFACTURER

Table 3. Thailand: Suppliers of Construction Equipment and Their Market Shares, 2013 (Units)

	Asphalt Finishers	Backhoe Loaders	Compaction Equipment	Crawler Dozers	Crawler Excavators	Dump Trucks	Mini Excavators	Mobile Compressors	Mobile Cranes	Motor Graders	Skid-Steer Loaders	Telescopic Handlers	Wheeled Excavators	Wheeled Loaders
Airman	-	-	-	-	-	-	-	25	-	-	-	-	-	-
Ammann	-	-	10	-	-	-	-	-	-	-	-	-	-	-
Atlas Copco	-	-	-	-	-	-	-	110	-	-	-	-	-	-
Bobcat	-	-	-	-	-	-	2	-	-	-	20	-	-	-
Bomag	-	-	12	-	-	-	-	-	-	-	-	-	-	-
Caterpillar	-	57	37	23	675	32	5	-	-	49	3	-	-	60
Çukurova	-	15	-	-	-	-	-	-	-	-	-	-	-	-
Doosan	-	-	-	-	136	-	-	70	-	-	-	-	15	17
Dynapac	-	-	4	-	-	-	-	-	-	-	-	-	-	-
Foton Lovol	-	-	-	-	-	-	-	-	-	-	-	-	-	15
Grove	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hamm	-	-	29	-	-	-	-	-	-	-	-	-	-	-
Hitachi	-	-	-	-	561	-	2	-	-	-	-	-	-	17
Hyundai	-	-	-	-	181	-	6	-	-	-	-	-	3	26
JCB	-	160	5	-	43	-	20	-	-	-	-	2	-	-
John Deere	-	-	-	13	-	-	-	-	8	-	-	-	-	2
Kato	-	-	-	-	-	-	-	-	5	-	-	-	-	-
Kawasaki	-	-	-	-	-	-	-	-	-	-	-	-	-	50
Kobelco	-	-	-	-	811	-	-	-	2	-	-	-	-	-
Komatsu	-	-	-	4	870	6	-	-	-	-	-	-	-	-
Kubota							1,000							
Liebherr									4					
LiuGong	-	-	8	-	100	-	-	-	-	3	-	-	-	300
Mitsubishi	-	-	-	-	-	-	-	-	-	7	-	-	-	-
New Holland	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sakai	-	-	115	-	-	-	-	-	-	-	-	-	-	-
Sany	-	-	-	-	177	-	-	-	169	15	-	-	-	-
SDLG	-	-	-	-	-	-	-	-	-	-	-	-	-	62

Source: Off-Highway Research (Continued)

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Table 3. Thailand: Suppliers of Construction Equipment and Their Market Shares, 2013 (continued) (Units)

	Asphalt Finishers	Backhoe Loaders	Compaction Equipment	Crawler Dozers	Crawler Excavators	Dump Trucks	Mini Excavators	Mobile Compressors	Mobile Cranes	Motor Graders	Skid-Steer Loaders	Telescopic Handlers	Wheeled Excavators	Wheeled Loaders
SEM	-	-	-	-	-	-	-	-	-	-	-	-	-	105
Shantui	-	-	-	6	-	-	-	-	-	-	-	-	-	-
Sumitomo	1	-	-	-	132	-	-	-	-	-	-	-	-	-
Tadano	-	-	-	-	-	-	-	-	37	-	-	-	-	-
Takeuchi	-	-	-	-	-	-	10	-	-	-	-	-	-	-
Terex	-	25	-	-	-	-	-	-	2	-	-	-	-	-
Vögele	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Volvo	3	1	50	-	397	-	19	-	-	13	-	-	6	8
XCMG	-	-	45	-	20	-	-	-	35	5	-	-	-	340
Xiagong	-	-	-	-	-	-	-	-	-	-	-	-	-	120
Zoomlion	-	-	-	-	14	-	-	-	104	-	-	-	-	-
Others	-	-	-	-	-	3	-	15	6	-	-	-	-	-
Total	**7**	**258**	**315**	**46**	**4,117**	**41**	**1,064**	**220**	**364**	**100**	**23**	**77**	**24**	**1,276**

Source: Off-Highway Research

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WHEELED LOADERS

The market was the subject of abnormally high growth during the last two years, largely as a result of the Thai government's now notorious rice pledging scheme. It is estimated that over 50 per cent of wheeled loader sales in 2012 and 2013 were made to the rice handling mills, although flood repair works also contributed to the spike in demand. The sector is dominated by Chinese suppliers who are able to offer machines at one third of the price of equivalent Western products.

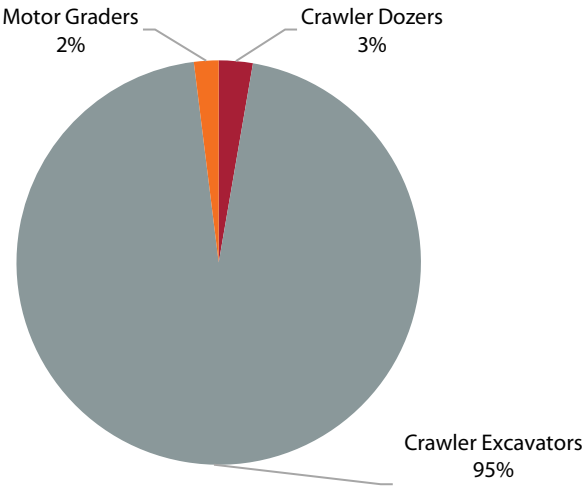
PRODUCTION

Table 4. Thailand: Production of Construction Equipment by Type and Manufacturer, 2009-2013

	2009		2010		2011		2012		2013	
	Units	%	Units	%	Units	%	Units	%	Units	%
Crawler Dozers	-	-	-	-	-	-	-	-	175	3
Crawler Excavators	3,670	99	6,430	98	8,800	98	8,550	99	6,150	95
Motor Graders	51	1	121	2	212	2	118	1	127	2
Total	**3,721**	**100**	**6,551**	**100**	**9,012**	**100**	**8,668**	**100**	**6,452**	**100**

Source: Off-Highway Research

Chart 2. Thailand: Production of Construction Equipment by Type and Manufacturer, 2013



Source: Off-Highway Research

CRAWLER EXCAVATORS

The rise of the domestic excavator market convinced **Komatsu** and **Kobelco** to invest in local production in 1996. An improving domestic market and buoyant exports to the Southeast Asia region have resulted in a rapid expansion of production volumes at both companies' plants in recent years.

At **Komatsu**'s Chonburi plant, an increase in production capacity has seen the transfer of some PC300 model production from the Komatsu excavator plant in Indonesia. Output peaked at nearly 6,000 units in 2011 in response to sharply rising

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demand in the Thai and Indonesian markets, although declined significantly in 2013 as a result of reduced demand in Thailand.

In 2008 **Kobelco** opened a new 71,800 m² assembly plant for excavators in Rayong, which is located some 12 kilometres from its original factory. During the last three years the plant has been operating at almost full capacity and output has increased threefold compared to just four years ago. The original factory in Pluakdaeng is now responsible for the sub-assembly of buckets, booms, arms, undercarriages and centre sections of the upper frames.

MOTOR GRADERS

In November 2013 Mitsubishi Heavy Industries (MHI) agreed to sell its motor grader business to **Hidromek**, a leading manufacturer of construction machinery based in Ankara, Turkey. Under the terms of the agreement, Hidromek has purchased ownership of MHI-Pornchai Machinery Co. Ltd, the production base on the large Amata Nakorn Industrial Estate in Chonburi that had manufactured MHI's products for markets in the Middle East and Southeast Asia. Output peaked at over 200 units in 2011, underpinned by strong exports to Indonesia, but has subsequently reverted to 120-130 units per year.

CRAWLER DOZERS

In January 2011 **Caterpillar** announced its intention to expand its manufacturing operations in Thailand by building a new facility to produce medium sized crawler dozers. Construction of the 40,000 m² factory at the Hemaraj Rayong Industrial Land in Rayong Province, close to the huge Eastern Seaboard industrial estate, was completed in January 2013. The name of the manufacturing operation is Caterpillar Rayong Thailand Tractors, otherwise known as CRTT. The current production programme encompasses two models – the D6R and the D8R; D5 and D7 models will be incorporated into the production schedule at a later date.

MACHINE POPULATIONS

Many products are more numerous than ever before, with the growth being fuelled by imports of used construction equipment, mainly from Japan, but also from Malaysia, Singapore and Taiwan.

ASPHALT FINISHERS

The population is estimated at 500 units. The main end-user segments are the specialist private contractors, many of whose work involves maintenance of the existing road network, and state road departments at various levels.

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BACKHOE LOADERS

The largest application is maintenance of the infrastructure by the local authorities, with new construction preferring generally to move earth with small crawler excavators. Farmers and water authorities use them in rural areas and even in Bangkok for cleaning the water courses.

COMPACTION EQUIPMENT

The main end-users of rollers are the specialist road building companies. Although plant hire is not developed in Thailand, there are also a plethora of small rental companies who own four or five units of soil compactors. Around 10 per cent of new machine sales go to government tender projects, although the Department of Highways now prefers to employ specialist sub-contractors to carry out road building operations. Other buyers of new rollers include the Royal Thai Army, which has its own maintenance division.

Table 5. Thailand: Population of Construction Equipment and Agricultural Tractors, 2014 (Units)

Asphalt Finishers	500
Backhoe Loaders	2,000
Compaction Equipment*	10,000
Dump Trucks	380
Crawler Dozers	5,000
Crawler Excavators	30,000
Crawler Loaders	250
Mini Excavators	5,000
Mobile Compressors	3,000
Mobile Cranes	10,000
Motor Graders	2,000
Skid-Steer Loaders	500
Telescopic Handlers	750
Wheeled Excavators	300
Wheeled Loaders	5,000
Total Construction Equipment	**74,680**
Agricultural Tractors	250,000

* Ride-on types only

Source: Off-Highway Research

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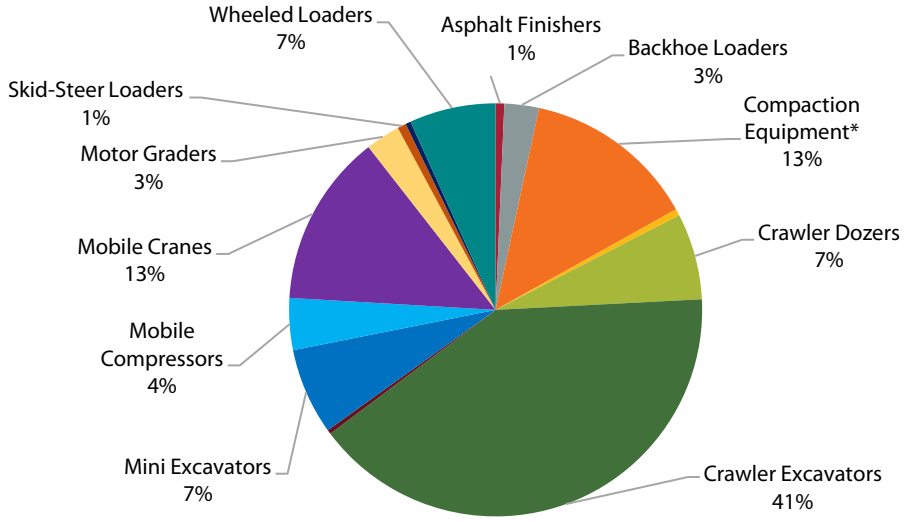
Chart 3. Thailand: Population of Construction Equipment and Agricultural Tractors, 2014 (Units)



Source: Off-Highway Research

CRAWLER DOZERS

In construction, the leading user is the state, represented by the Ministry of the Interior, the Army and the Provincial Administrations. The biggest single users, the shrimp farms with their little 40-50 horsepower units, have ceased to grow. Inland farms have been banned, long reach excavators are being favoured for pond construction and hoses are replacing mechanical means for removing sludge.

CRAWLER LOADERS

There are still some units in use in road construction on more difficult terrain and in maintenance of roads within quarries and mines.

DUMP TRUCKS

Articulated dump trucks have made little progress in mining, and most civil engineering projects employ 10 wheel on-highway trucks to do earthmoving. The rigid dump truck population in lignite mining and limestone production is growing and the cement industry is an important user. Rigid trucks are also widely used in the gold, copper, silver, zinc, tin and potash mining sectors.

HYDRAULIC EXCAVATORS

Private contractors appear dominant in the population of excavators because they are holding on to hundreds of old machines. Over 75 per cent of the population consists of 20 tonne crawler excavators, although during the last three years 13 and 16 tonne machines have grown in prominence in line with the declining availability of cheap manual labour. Sales to government users form only about 10 per cent of the market today, since much of the work undertaken by the government is sub-

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contracted to private construction companies. The state sector in total probably owns around 5,000 hydraulic excavators, spread around the Department of Highways, the Royal Irrigation Department and EGAT, the power generator.

MINI EXCAVATORS

The main end-user segments are small contractors and agriculture. The high volume of sales by Kubota during the last three years has expanded the population enormously and it is now estimated to be in the region of 5,000 units.

MOBILE COMPRESSORS

Rental companies now dominate the industry, owning about 60 per cent of the machines. The construction industry is progressively ridding itself of machines and assuming that if it needs them later, the rental industry will provide them. In the government sector the largest owners are the Department of Highways, EGAT, and the power distribution agencies.

MOBILE CRANES

Crane rental companies dominate the population and have the highest number of usable cranes. Rough terrain cranes constitute around 50-60 per cent of active machines, although Chinese truck-mounted cranes have formed an increasingly important segment of the population. The bulk of the population are second-hand machines, which have been imported mainly from Japan, but also from Malaysia, Singapore and Taiwan. The largest fleets are with market leaders such as TCJ Big Crane, Crane Service Co., Thai Rent All and TSK. In the public sector the biggest fleets belong to the Royal Irrigation Department, the Provincial Electricity Authority (PEA), EGAT and the Royal Thai Army.

MOTOR GRADERS

The public sector has sustained a population of about 1,000 units, working for the Department of Highways and the Royal Thai Army, while the private sector, which subcontracts work from clients such as the Royal Irrigation Department and the provincial road authorities, probably accounts for a further 1,000 units.

SKID-STEER LOADERS

Recent sales have been to sugar mills and palm oil processors who already have fork lift trucks and other handling machines to use, while the expanding volume of trade in the ports has fostered some interest in using larger skid-steer loaders for ship trimming. The existing machines in construction can infrequently be seen working on housing sites or in landscaping.

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WHEELED LOADERS

Wheeled loaders are engaged in all aspects of the construction industry and are widely used in rice and tapioca handling mills. Nevertheless, the variety of applications in which they are used remains relatively limited in Thailand compared to developed global markets and many potential users prefer to use alternative products such as crawler excavators. The availability of cheap manual labour means that compact wheeled loaders are rarely seen in materials handling applications.

FORECAST TO 2018

Most suppliers now accept that demand will continue to contract by 30-40 per cent in 2014. Although the NCPO interim administration has pledged to 'return happiness to the Thai people', restore democracy and root out the widespread political corruption that has held back the country's development on so many levels, the country has grown weary of unfulfilled promises from their leaders, be they civilian or military.

Table 6. Thailand: Forecast Sales of Construction Equipment and Agricultural Tractors, by Type, 2014-2018 (Units)

	2014	2015	2016	2017	2018
Asphalt Finishers	5	8	10	10	12
Backhoe Loaders	140	180	220	250	250
Compaction Equipment*	170	290	342	377	399
Dump Trucks	18	35	43	50	55
Crawler Dozers	25	35	60	75	75
Crawler Excavators	2,450	3,000	4,500	5,000	5,250
Mini Excavators	800	1,100	1,500	1,750	1,800
Mobile Compressors	175	200	230	250	250
Mobile Cranes	195	325	375	425	450
Motor Graders	40	50	100	110	120
Skid-Steer Loaders	15	25	25	35	35
Telescopic Handlers	50	75	80	85	90
Wheeled Excavators	25	35	40	50	60
Wheeled Loaders	500	500	600	650	700
Total Construction Equipment	**4,608**	**5,858**	**8,125**	**9,117**	**9,546**
Agricultural Tractors	24,500	26,750	29,000	33,000	35,250

* Ride-on types only
Source: Off-Highway Research

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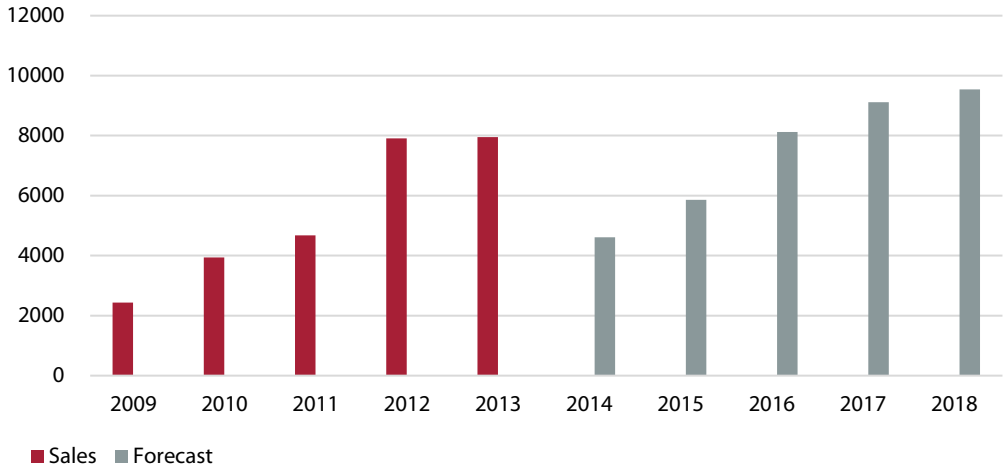
Chart 4. Thailand: Forecast Sales of Construction Equipment and Agricultural Tractors, by Type, 2009-2018 (Units)



Source: Off-Highway Research

Pledges to sanction funds for the vast array of postponed infrastructure projects outlined by the ousted Pheu Thai government, would suggest a bright outlook for sales of construction equipment in the medium to long term. If the necessary funds and budgets are indeed approved, then the belief of suppliers that the market for crawler excavators has the potential to exceed 5,000 units is realistic. The prognosis therefore presupposes that the military government honours its pledges of major investment in public works and, more importantly, can reassure its people that political stability is at last an achievable goal.

ASPHALT FINISHERS

There is virtually no requirement for new road building in Thailand and maintenance and extensions of the existing network are the primary application of the asphalt finisher. The lack of a large replacement market means that sales of new machines are unlikely to fluctuate significantly during the period under review.

BACKHOE LOADERS

The municipalities and regional authorities have been understandably wary of spending money in recent years, although the prospect of renewed political stability and increased infrastructure investment should encourage both private and public sector customers to implement replacement programmes for ageing fleets of backhoe loaders.

COMPACTION EQUIPMENT

Demand in the short term is expected to contract by up to 50 per cent as contractors postpone new machine purchases until a resolution to the current political crisis is found. In the medium to long term, demand will be heavily influenced by the level

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of investment the new government is prepared to allocate to public works projects. At any rate there is unlikely to be any wide fluctuation in volumes for the foreseeable future, but rather a level of stability.

CRAWLERS DOZERS

If the military government's pledges of increased infrastructure spending on water management projects, roads, railways and power plants are fulfilled, it is likely that demand will increase to 75 units per year towards the end of the forecast period, following the contraction of the market in 2014 and 2015. Sales to the mining sector are generally more predictable, and the regular replacement programmes of these customers, who purchase only new equipment, will continue to sustain a stable level of demand for new dozers.

DUMP TRUCKS

Demand for articulated dump trucks is forecast to remain at a low level for the foreseeable future and will be sustained by Thai mining companies, which also operate on a regional basis across Laos and Cambodia. The forecast for rigid dump trucks implies irregular investment by the lignite and cement industries, and no wholesale adoption of rigid dump trucks by the civil engineering sector.

HYDRAULIC EXCAVATORS

The prospects of renewed political stability, sustained economic growth and government pledges of significant investment in infrastructure projects suggest a buoyant outlook for the crawler excavator sector. Sales are expected to decline by 30-40 per cent in 2014, followed by a modest recovery in 2015 and significantly more sustained growth towards the end of the forecast period as the country seeks to develop its role as the main business hub within the forthcoming ASEAN Economic Community.

MINI EXCAVATORS

There is little doubt that the mini excavator sector has the potential to grow enormously in the long term as the availability of cheap manual labour declines and the requirement for inner city construction projects rises. Urban transformation projects will underpin much of this growth, although land irrigation and water management projects can be expected to furnish increased demand for the product.

MOBILE COMPRESSORS

There is no possibility of the mobile compressor returning to its position as an all-purpose tool that it was in the 1980s. Nevertheless, there is much civil engineering work planned for the years to come and by concentrating on high outputs and high pressures, the suppliers could reach a yearly rhythm of 200-250 units.

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MOBILE CRANES

Assuming a return to improved political stability in 2015 and in view of the military government's pledges to approve budget funds for long awaited mega-infrastructure projects, one might reasonably expect a significant improvement in demand for new mobile cranes in the period to 2018. Used cranes will still fulfil most demand in the forecast period, but there is more chance of buyers opting for new than there was in the first decade of the new millennium. Much of the growth is likely to be accounted for by the Chinese suppliers.

MOTOR GRADERS

The vast amount of infrastructure investment pledged by the military junta will initially be focused on transportation projects and include plans for up to 15,000 kilometres of four lane highway extensions and a significant volume of railway construction. The medium to long-term outlook for the grader sector therefore looks extremely promising and volumes are likely to stabilise at a level of 100-120 units per year towards the end of the forecast period.

SKID-STEER LOADERS

The forecast assumes that industrial applications will continue to form the bulk of demand and those needs will be fairly small.

TELESCOPIC HANDLERS

A steady volume of sales will continue to be generated by rental companies, large contractors and industrial users, although there is unlikely to be any significant rise in demand during the forecast period. The outlook for the short term will inevitably be affected by the political crisis, although demand should recover towards the end of the forecast period as business confidence returns and fleet replacement programmes are initiated.

WHEELED LOADERS

Demand for wheeled loaders is likely to contract significantly in the short term as a result of the poor investment climate and the cancellation of the government's ill-conceived rice subsidy scheme. The fleet replacement programmes of the crop handling mills and quarries should nevertheless sustain a healthy level of new sales in the medium to long term at least.

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POLITICS AND THE ECONOMY

POLITICAL HISTORY

The collection of principalities extending over Western Thailand and Southern Burma, and known by the Sanskrit name of Dvaravati, was overrun by the Khmers in the 11th century. The Khmers then ruled Cambodia, southern Vietnam and most of Thailand and Laos and called the Thais 'Syam', possibly from the Sanskrit *shyama*, meaning 'golden' or 'swarthy'. The Thai kingdom was eventually called Syam or Sayam.

In 1238 one of the principalities wrested independence from the Khmers and called itself Sukothai, the first true Thai kingdom. It reached over most of central Thailand and northern Laos and under its third king a writing system was created and the Thai form of Theravada Buddhism codified. The kingdom of Ayuthaya took it over in 1376 and grew more and more powerful during the ensuing century. It took over U Thong and Lopburi and eventually occupied the territory corresponding to the whole of present-day Thailand, Cambodia and Laos, as well as much of Burma and part of northern Vietnam.

The capital, Ayuthaya, was one of the wealthiest cities in Asia, although for the latter half of the 16th century the kingdom fell temporarily under Burmese control. Back under Thai rule after 1594, it received many European visitors. The Dutch came in 1605 (nearly a century after the first Portuguese embassy), then the English in 1612, the Danes in 1621 and the French in 1662. The Burmese invaded again in 1765 and captured Ayuthaya in 1767. They sacked the capital but a half-Thai, half-Chinese general called Phraya Taksin set up a new capital in Thonburi, on the banks of the Mae Nam Chao, opposite Bangkok. He soon regained control of the whole country and became one of the most autocratic of the kings of the country. In 1782 his successor was crowned as Rama I, the first of a continuous line of nine kings in the Chakry dynasty, all called Rama.

During the nineteenth century the monarchy introduced printing presses, reformed the education system with schools organised along European lines and abolished slavery and state labour. Railways were built and a civil service was created. Unfortunately the country was weaker than the European powers of the time and had to give away Laos (1893) and Cambodia (1907) to France; and three Malay states to British Burma in 1909.

During the reign of Rama VI (1910-1925) compulsory education and other educational reforms were introduced. He also made the Thai calendar conform to the western system; and in 1909 all Thais were made to adopt a Thai surname, whereas previously they had used only a single 'original' name.

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During the reign of the next monarch, Rama VII, constitutional monarchy was established in a bloodless coup in 1932 but after an attempted counter-coup in 1933 the king was isolated and eventually abdicated in 1935. One of the leaders of the 1932 coup, Phibul Songkram, led the country from 1938 to 1944. He changed the name of the country to Thailand and led it into the war on the side of Japan. He was overthrown in 1944 but came back to power in 1947, now as a field marshal. He was an extreme anti-Communist and refused to recognise the People's Republic of China in 1949. He lost power in 1951 to General Sarit, who lost power in 1957 and regained it in a military coup in 1958. From 1964 to 1974 the country was ruled by army officers, who allowed the USA to build bases in Thailand in support of the Vietnam campaign.

Student demonstrations overthrew the military leaders in 1973 and installed a multi-party coalition that implemented a national minimum wage, the repeal of anti-Communist laws and the ejection of the American bases by 1976. In 1980 Prem Tinsulanonda came to the helm and swung Thailand round to a more open, democratic and tolerant type of society. He managed to persuade the students to cease supporting communist insurgents based in the forests and dismantled the Communist Party of Thailand. His successor, Chatichai even managed to rule with a cabinet that was only about one-third composed of ex-army officers.

Some high ranking military officers did not like what Chatichai did and executed a successful military coup in 1991. They sponsored a new constitution, where the nominated upper house of 270 senators would guarantee that, whatever happened in the elections for the 360 seat lower house, the military could stay in control. They tried to push out the winner of the March 1992 elections, Narong Wongwan but failed. His majority was too small and he was soon replaced after another election by Chuan Leekpai, a street trader's son. His successor was the billionaire Banharn Silapa-archa and lasted only two years, noted for their corruption scandals. He was followed by an ex-soldier, Chavalit Yongchaiyudh but he fell from power when he failed to deal well with the Asian Financial Crisis of summer 1997.

RECENT POLITICAL DEVELOPMENTS

Elections in 2001, the first held under the new, more democratic constitution created in 1997, resulted in a victory for the Thai Rak Thai party (TRT) under the leadership of the millionaire Thaksin Shinawatra. Thaksin was a populist and his TRT party had quite a big power base, 248 seats in the 500 seat House of Representatives. His reputation was enhanced as a result of his handling of the effects of the December 2004 tsunami, but since the beginning of that year he had been obliged to impose martial law in the southern provinces where Muslim separatism had created violence. He won a massive victory in elections in February 2005, 377 out of 500 seats but during that year he grew increasingly unpopular with the urban middle class who gained nothing from his populist moves. It came to a head when he engineered

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it so that the members of his family who sold their shares in the Shin telecoms company to a Singapore investor for $1.19 billion paid no capital gains tax.

Challenging the protestors, he called another election but all the opposition parties boycotted it in April 2006. There was strong abstention in Bangkok but TRT was still popular in the north, north-east and centre. TRT candidates failed to get a necessary minimum of votes in 38 constituencies and the elections were annulled in the following month. Thaksin returned as a caretaker PM and proclaimed elections for October 2006.

On 19th September 2006, however, a peaceful military coup took over power, to a general sense of relief. The leaders created a Council of National Security to run the country and appointed a retired general Surayud Chulanont to be PM until the next elections. Thaksin set up home in London but in May 2007 his TRT party was found guilty of electoral fraud and dissolved. Undeterred, his supporters formed the People's Power Party (PPP), which despite its ill-concealed opposition to the royalist-military elite, won the December 2007 general election. In response the middle-class 'yellow shirts' under the umbrella of the People's Alliance for Democracy (PAD) stepped up their protests, and in December 2008 matters came to a head when the PAD seized and closed down Bangkok's Suvarnabhumi and Don Muang airports. The People's Power Party was declared illegal and Pheu Thai, the PPP's swift reincarnation, found itself unable to form a new coalition government. Instead, the Democratic Party, led by Abhisit Vejjajiva, formed a new government with the Friends of Newin Party.

However, the divisions between the pro- and anti-Thaksin camps remained unresolved and escalated dramatically in 2010 when pro-Thaksin 'Red Shirts' launched a series of protests and blockages of roads and businesses in central Bangkok, eventually culminating in military intervention and the deaths of 92 protestors. In the elections held in July 2011 the Pheu Thai party, under the leadership of Thaksin's 44-year-old sister Yingluck Shinawatra, gained a landslide victory in what several observers saw as a resounding endorsement of democracy in this turbulent nation and a devastating indictment of the incumbent Democratic Party's failure to shake off its image as an aloof, establishment party more at home with Western bankers than Thai villagers.

Anti-government protests recommenced in late 2013, as a broad alliance of protestors, led by former opposition deputy leader Suthep Thaugsuban demanded an end to the so-called Thaksin regime. A blanket amnesty for people involved in the 2010 protests, altered at the last minute to include all political crimes, including all convictions against Thaksin, triggered a mass show of discontent, with up to an estimated 400,000 people taking to the streets. The Senate was urged to reject the bill to quell the reaction, but the measure failed.

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A newly named group, the People's Democratic Reform Committee (PDRC) along with allied groups, escalated the pressure, with the opposition Democrat party resigning en masse to create a parliamentary vacuum. Protesters' demands variously evolved as the movement's numbers grew, extending a number of deadlines and demands that became increasingly unreasonable or unrealistic, yet attracting a groundswell of support. They called for the establishment of an unelected 'people's council', in place of Yingluck's government, that would cleanse Thai politics and eradicate the Thaksin regime. In response to the intensive protests, Yinluck dissolved parliament on 9th December 2013 and proposed a new election for 2nd February 2014.

The PDRC insisted that the prime minister stand down within 24 hours, regardless of her actions, with 160,000 protesters in attendance at Government House on 9th December. Yingluck insisted that she would continue her duties until the scheduled election in February 2014, urging the protesters to accept her proposal. Disrupted by the anti-government protesters, the election was not completed on that day. The Constitutional Court then nullified the election on 21st March 2014. On 7th May 2014, the Constitutional Court ruled that Yingluck would have to step down as the prime minister as she was deemed to have abused her power in transferring a high-level government official.

Following months of political instability and increasing violence on the streets of Bangkok, the Royal Thai Army, led by General Prayuth Chan-ocha, eventually intervened in the crisis and declared martial law on 20th May 2014. On 22nd May, the Army announced that it was staging a coup and was taking control of the country and suspending the country's constitution. The military established a junta called the National Council for Peace and Order (NCPO) and after dissolving the government and the Senate, vested the executive and legislative powers in its leader and ordered the judicial branch to operate under its directives. In addition, it partially repealed the 2007 constitution, declared martial law and a nationwide curfew, banned political gatherings, arrested and detained politicians and anti-coup activists, imposed internet censorship and took control of the media.

General Prayuth has said he will run the country until the situation requires an interim government. Unlike in previous coups, there have been no promises of a quick return to civilian rule, although the NCPO has indicated that democratic elections could take place in October 2015. Thailand's new military rulers are moving ahead with plans to reform the country's electoral system and develop a new interim constitution as they face continuing international pressure to restore democracy. There is a long way to go before elections can be held, however.

General Prayuth himself has said little about what kind of democracy Thailand will become when he relinquishes power. It also remains unclear whether he will satisfy

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the millions of Thais, many in rural areas, who voted for populist billionaire Thaksin and, more recently, his sister, the previous prime minister, Yingluck Shinawatra.

ECONOMIC BACKGROUND

Thailand is the second largest economy in Southeast Asia after Indonesia and has advanced to the status of a middle-income country. Beginning in the 1980s, Thailand's economy was built on open foreign investment policies and encouragement of the private sector. Manufacturing-led economic growth averaged 7.5 per cent per year in the quarter century that preceded the Asian financial crisis based on abundant and inexpensive labour and natural resources. However, output fell sharply in 1997-1998 leaving millions of people unemployed. Thailand sought to regain economic momentum in 2001 by embracing a "dual track" economic policy that combined increased domestic activity with traditional promotion of open markets and foreign investment.

Thailand's development has been accompanied by sizeable changes in the structure of the economy. The country has significantly diversified from being a major rice exporter to a main production hub of multinational corporations in the automotive and electronic industries. The share of GDP accounted for by industry has more than doubled from 21 per cent in 1970 to 42 per cent today, while the share coming from the agricultural sector has fallen from 23 per cent to around eight per cent.

Thailand's recovery from the 1997 Asian financial crisis depended mainly on increasing exports, which now account for more than two-thirds of GDP. Since the 1970s, the share of primary products in exports fell by 70 per cent while that of electronics, automotive and other manufactures increased by 57 per cent. China became Thailand's largest export destination in 2010 replacing the United States. Thai export growth and economic recovery since 2008 have been driven primarily by demand from Thailand's regional trading partners.

The electronics industry is the largest exporter in Thailand with hard disk drives contributing 32 per cent of the total production value of the sector. Most firms are original equipment manufacturers (OEMs) for multinational enterprises. In 2006, Thailand was first in world rankings of hard disk drive exporters with a global market share of 48 per cent. Another main export is automobiles and automotive parts, which account for 12 per cent of GDP. Rather than developing indigenous brands, Thailand is a key production base for global automotive firms from Japan, the United States and Europe. It ranks 13th among the motor vehicle producing countries in the world, and it is predicted that Thailand will be one of the top 10 producers in the world by 2015.

About 49 per cent of Thailand's labour force is still employed in agriculture although this portion has decreased from 70 per cent in 1980. The agricultural sector has

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experienced a transition from labour intensive and traditional methods to more modern production techniques. Rice remains the country's most important crop as Thailand is among the top exporters in the world rice market. Other agricultural commodities produced in significant amounts include fish and fishery products, tapioca, rubber, grain and sugar. Exports of processed foods such as canned tuna, pineapple and frozen shrimp are on the rise.

Thailand's service sector is also growing, particularly tourism whose revenues contribute about six per cent of GDP. European tourists comprise the largest percentage of visitors from high-income countries. Although Thailand has experienced a decrease in foreign tourists in 2013 and in the first half of 2014 as a direct consequence of the political turmoil, the country remains a competitive tourist destination and the recovery in consumer spending in advanced economies will continue to drive growth in this sector

RECENT ECONOMIC HISTORY

Table 7. Thailand: Main Economic Indicators, 2009-2013

	2009	2010	2011	2012	2013
GDP (US$ Bn)	263.7	318.9	345.7	366.0	387.2
GDP Per Capita (US$)	3,943	4,740	5,115	5,390	5,674
Real GDP Growth (%)	-2.3	7.8	0.1	6.5	2.9
Current Account Balance (US$ Mn)	21,896	10,024	4,105	-1,470	-2,790
Current Account Balance (% GDP)	8.3	3.1	1.2	-0.4	-0.7
Goods and Services Exports (% GDP)	68.6	70.8	75.4	75.3	73.5
Inflation (%)	-0.9	3.3	3.8	3.0	2.2

Source: Bank of Thailand

After the Asian financial crisis of 1997, Thailand experienced a significant slowdown in economic growth, which averaged under four per cent per year in 2001-2009. The country was further hit by the global economic crisis, which caused growth in gross domestic product (GDP) to fall to 2.8 per cent in 2008 and -2.3 per cent in 2009.

A resurgence of economic activity led to 7.8 per cent growth in 2010, but the onset of severe flooding throughout the country during the second half of 2011 saw growth collapse to just 0.1 per cent that year. The economy performed strongly in 2012, however, despite having to battle turbulence generated by the Eurozone crisis, the US debt situation and slowdowns in key emerging markets, including China. GDP growth of 6.5 per cent was supported mainly by household consumption and investments as part of flood rehabilitation and the government's consumption-stimulating measures.

In 2013 Thailand's economy came under growing pressure, with political unrest combining with falling industrial output, reduced government spending, and weakening exports to slow development and cool investor confidence. The net result was that GDP growth slowed sharply to 2.9 per cent. On the supply side, nearly all the growth in GDP was generated by services, while agriculture and industry barely

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contributed. Services got a boost from a 19.6 per cent increase in tourist arrivals to 26.6 million in 2013, with the rate of increase ebbing in the fourth quarter as political strife worsened.

Manufacturing in 2013 was flat in response to slack demand for exports and subdued domestic demand. The production of electronics fell by 6.2 per cent and of electrical appliances by 3.3 per cent. Automobile production, which had soared by 68.3 per cent in 2012 on stimulation from the tax rebate after the floods, rose by only 0.1 per cent in 2013. Construction increased by 1.2 per cent for the year, with all gains in the first half followed by contraction in the second.

Fiscal policy tightened in FY2013 (ended 30th September 2013) as legal challenges and political distractions frustrated the government's pursuit of planned infrastructure projects. Only $261 million was disbursed from an $11.7 billion off-budget programme to build water-management infrastructure. Tax breaks and relief payments to stimulate private consumption after the 2011 floods expired in 2012, though the program to boost farm incomes through government rice purchases continued into 2013.

A number of analysts have already factored in the potential for an extended period of political instability in their predictions for the economy in 2014, with the Bank of Thailand lowering its expectations for GDP expansion from its previous forecast of 2.7 per cent down to 1.5 per cent.

Table 8. Thailand: GDP Growth, 2009-2013 (Annual % Change)

2009	2010	2011	2012	2013
-2.3	7.8	0.1	6.5	2.9

Source: Economist Intelligence Unit

SHORT-TERM ECONOMIC OUTLOOK

The outlook for the Thai economy is subject to unusually high uncertainty. Government policy making has remained constrained through the first half of 2014 and economic growth is projected at a modest 1.5 per cent, accelerating to 3.5-5.0 per cent in 2015 provided that a stable government is formed next year.

Major public infrastructure programmes had been expected to drive growth in 2014 and 2015: the $11.7 billion water-management projects to mitigate the country's vulnerability to floods and $67 billion in proposed investments through 2020 to upgrade transport infrastructure using off-budget loans. The water-management projects are delayed by legal challenges, and the transport investment programme was ruled in March 2014 unconstitutional as structured. Some significant investments by state-owned enterprises, such as in telecommunications, were on hold in the first quarter of 2014, and many large private sector investments faced delays as the Board of Investment could not approve investment privileges under

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the caretaker government. Furthermore, the budget for the fiscal year starting in October 2014 could suffer delayed approval.

The political deadlock has damaged consumer and business confidence. This has hurt private consumption, business activity, and investment. The tourism industry has reported that tourist arrivals were down by some 20 per cent in the first half of 2014 compared with a year earlier. Imports of consumer goods fell by 12 per cent in January 2014 year on year and passenger car sales plunged by 60 per cent in that month. Subdued private investment is likely to persist well into 2014 and investors are expected to be cautious, waiting for the new government's policy direction.

Consumption and investment are forecast to rebound in 2015, assuming the political situation improves. Low domestic interest rates will assist the investment revival, as will better international economic prospects. External demand is expected to improve both this year and next. Major trading partners in the US and euro area will record stronger performances, countered to some degree by more sedate growth in the People's Republic of China. The baht's depreciation will help exports.

While the FY2015 budget may be delayed because of the political deadlock, the eventual formation of a new government should allow investment in infrastructure to step up in 2015, bolstering the economy next year.

Over the past six years, Thailand has suffered bouts of political unrest on top of the global financial crisis and severe flooding. Nevertheless, the economy maintains solid economic fundamentals that support its resilience, with high international reserves, relatively low inflation, a moderate amount of government and external debt, and a strong manufacturing base.

Against this backdrop of uncertainty and economic weakness, the military junta has focused its attention on revitalising the economy in a bid to boost its popularity. As a first step, the military government ordered the payment of some $3 billion owed to rice farmers by the previous Pheu Thai Party-led government, which was buying the crop at above market prices. The army's decision to pay farmers is considered as a step in the right direction, as around 40 per cent of the Thai population is still dependent on agriculture, and the payments could boost their purchasing power. This, in effect, could spur private consumption, which dropped by about two per cent in the first quarter of 2014. The development has also prompted many Thai economists to upgrade their outlook for the economy.

Thailand's ruling military has also recently relaxed its curfew and other restrictions to reduce the economic impact on tourism in a bid to maintain the revenue target of THB2 trillion this year. There are also plans to increase government spending on infrastructure projects that could contribute to long-term growth. In June 2014 the Board of Investment of Thailand, in conjunction with the ruling National Council

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for Peace and Order (NCPO), approved THB122.8 billion, or $3.8 billion, in investment incentives to 18 projects in a bid to kick-start the economy.

ECONOMIC IMPLICATIONS OF THE ASEAN ECONOMIC COMMUNITY (AEC)

Mainland Southeast Asia is poorly connected by hard infrastructure, but improvements are being made with the approach of the ASEAN Economic Community (AEC) in 2015. The AEC aims to turn the Association of Southeast Asian Nations (ASEAN) into a single market and production base with a free flow of goods, services, investment and skilled labour, as well as a freer flow of capital. Part of its remit is to upgrade regional transport links to harness benefits from increased intra-regional trade.

Some 600 million people live in the ten members of ASEAN, and the region's total GDP is expected to match that of Germany's economy by 2018. However, the economies are in many ways disparate. In some cases, they are simply too poor or sparsely populated to make big infrastructure projects viable. In addition, economic nationalism and concerns about cross border security are likely to continue to complicate closer trade integration. At present only one quarter of ASEAN's trade is between member states, according to ASEAN statistics; three-quarters of the grouping's trade is with the rest of the world. But as the economies get richer, intra-ASEAN trade will rise.

Vietnam, the Philippines and Brunei are least dependent on trade with fellow ASEAN member states. Vietnam and the Philippines are coastal nations, as is Brunei. Conversely, the countries that are most dependent on trade with other ASEAN members are landlocked Laos (two-thirds of its trade is intra-ASEAN) and Myanmar (with about one-half of the country's trade being with other ASEAN members). Indonesia and Thailand, richer and with sizeable domestic markets, are in the middle.

The idea of connecting economies by road and rail is particularly popular in mainland Southeast Asia. Thailand lies at the centre of this economic area, and Thailand's junta has earmarked US$60-95 billion for infrastructure investment until 2020. Much of the investment will go into upgrading ports, railways, roads and urban transport.

Once completed, these projects are likely to cut transport costs and help Thailand to ensure its attractiveness as a regional production platform. Many multinational companies operating in Southeast Asia speak of their “Thailand+1” strategy. By this they mean that their aim is to have a mother plant in Thailand and another plant in a poorer nearby country: Cambodia, Laos, Myanmar or Vietnam.

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In ASEAN and elsewhere enhancing intra-regional trade is primarily a question of abolishing non-tariff barriers. The AEC will bring down or remove tariffs on many goods. But this in itself will have a limited effect, as firms operating in the region often point out, unless ASEAN members also remove non-tariff barriers. Of these there are many, including corrupt customs officials, differing standards and incompatible regulations.

There is also the question of economic viability. Of the many road and rail projects in the pipeline, not all will bring in positive returns. Thailand and its three poorer neighbours - Cambodia, Laos and Myanmar - are one-half the size of India. With a population of some 140 million, the area is relatively sparsely populated. The region's economic hubs were built on maritime trade: Hanoi (the capital) and Ho Chi Minh City in Vietnam, Bangkok and Myanmar's commercial capital, Yangon. Non-maritime infrastructure projects are expensive and will remain a challenge.

One example of this is a planned road, train and pipeline corridor from Thailand's western province of Kanchanaburi to Myanmar's Gulf of Andaman. The proposed end-point is a US$50 billion port and industrial zone, Asia's biggest. The land bridge would save three to five days in shipping time compared with bringing goods to Thailand via the congested Strait of Malacca. But at Dawei, the proposed location of the megaproject, there is no energy infrastructure and few people. Investors have instead prioritised the development of Thilawa port, 600 kilometres north of Dawei, close to Yangon and a market of 60 million consumers in the Burmese heartland.

A proposed multibillion-dollar rail link running from the Vietnamese coast through Laos to Thailand faces similar problems. In this case, however, exploiting natural resources on Lao territory will help to make the project viable. Similar plans exist for a rail link from China's Yunnan province to the Lao capital of Vientiane and on to Bangkok. But none of these projects is likely to be completed before 2025.

Indeed, of the many proposed intra-regional infrastructure plans only a few are likely to see the light of day. Road transport is likely to win out over railways in a mountainous region with highly subsidised fuel prices and poorly developed or non-existent rail networks.

In many cases viability will be determined by the role of Asia's biggest economy, China. It is often said that China wants to develop the Bay of Bengal as its "second coast". In reality, a fair amount of Chinese trade is already conducted via the Thai port of Laem Chabang on the Gulf of Thailand. The infrastructure projects that have made the biggest difference are bridges across the Mekong River. The most recent addition, the Thai- and Chinese-financed fourth "Thai-Lao friendship bridge", inaugurated at the end of 2013, has already brought Yunnan within a few days journey of the Gulf of Thailand.

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THE ECONOMY BY SECTOR

The industrial and service sectors are the main sectors in the Thai gross domestic product, with the former accounting for 38.1 per cent of GDP in 2013. Thailand's agricultural sector produces 8.3 per cent of the GDP – lower than the trade and logistics and communication sectors, which account for 13.4 per cent and 10.2 per cent of GDP respectively. The construction and mining sector adds 4.3 per cent to the country's gross domestic product. Other service sectors (including the financial, education and hotel and restaurant sectors) account for 25.7 per cent of the country's GDP. Telecommunications and trade in services are emerging as centres of industrial expansion and economic competitiveness.

Table 9. Thailand: GDP by Sector, 2013

	%
Agriculture, Forestry and Fishing	8.3
Construction and Mining	4.3
Manufacturing	38.1
Transport, Storage and Communications	10.2
Wholesaling and Retailing	13.4
Other Services*	25.7
Total	**100.0**

* Includes financial sector, education, hotels and restaurants, others.
Source: Bank of Thailand

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GEOGRAPHY

TOPOGRAPHY

The Kingdom of Thailand is situated in the heart of Southeast Asia. It has an area of 513,115 km² and is therefore about the same size as France. The centre of the country, Bangkok, is on latitude 14º north, on a level with Madras, Manila and Khartoum. The country's longest north-south distance in 1,860 kilometres and it has about 1,520 kilometres of coastline on the Gulf of Thailand, home to the main harbours. On the western side the 560 kilometres of coastline along the Andaman Sea are deeply indented and hilly. The country has frontiers with Laos to the north and east, Burma to the west and north, Cambodia to the south and east and Malaysia on the south.

The topography varies from high mountains in the north, the extreme southerly part of a chain that runs as far north as the Tibetan plateau to limestone tropical islands in the south that form part of the Malay archipelago. There are four main regions:

- The southern Peninsula lies south of the Bight of Bangkok and is 90 kilometres long. It consists of mainly of narrow coastal lowland, backed by high wooded mountain ranges. The region is rich in tin mines and rubber plantations.

- Central Thailand is one of the great rice bowls of the world, a fertile alluvial plain with a well-developed system of natural waterways. The largest river is the Menam Chao Phraya, flowing south past Bangkok to the Gulf of Thailand and navigable for its entire length. With its tributaries, the Chao Phraya drains most of western Thailand; its valley is the country's main rice-producing region. The many distributaries of the Chao Phraya delta are interconnected by canals that serve both for irrigation and for transportation.

- The upland regions in the north consist of the western hills, ridges rising to nearly 1,000 metres and covered by dense, tropical monsoon forests; and the forested northern mountains, rising to 1,600 metres and broken by four parallel valleys that contain rivers that drain into the Menam Chao Phraya.

- The northeast region is a limestone plateau, the poorest part of the country but blessed with reserves of gypsum, iron ore, marble, salt, lead and manganese.

CLIMATE

The climate is tropical, with high levels of humidity. The monsoon produces three seasons in most of Thailand but two in the south. From the north down to Petchburi province in the south the monsoon arrives in July and lasts into November. The cool season then lasts until mid-February and is succeeded by the hot season until the monsoon arrives again. In the south, two monsoon periods overlap, so that it rains without a break from July to January.

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The average annual rainfall in Bangkok is 1,420 mm and the mean temperature is 28ºC, varying from a coldest night time temperature of 11ºC to a high in the hot season of 41ºC.

POPULATION

The last official national census was carried out in Thailand in 2010 and the country's official population was declared at 65.4 million. Current estimates show a 2014 population in Thailand of 68.2 million. The Thai Ministry of Foreign Affairs suggests that with unregistered individuals added to the final total, the Thailand population in 2014 is actually nearer 70 million. It is estimated there are 2.2 million illegal and legal migrants in Thailand, including approximately 200,000 expatriates from developed countries.

The life expectancy at birth is now as high as 73.6 years, a major advance from the past.

Table 10. Thailand: Population in the Main Provinces, 2013 (Million)

Bangkok	8.25
Chiang Mai	1.64
Khon Kaen	1.76
Nakhon Ratchasima	2.58
Nakhon Si Thammarat	1.52
Ubon Ratchathani	1.81
Udon Thani	1.54

Source: Department of Provincial Administration

Thailand is the 51st largest country on earth in terms of total area, but 20th in terms of population. Thailand is 88th in terms of population density, with 132.1 people per square kilometer.

While a substantial amount of people live in Bangkok and the surrounding Bangkok Metropolitan Region, around 70 per cent of the population still lives in rural areas. Bangkok, located in Central Thailand, has a population of more than 8 million, or close to 13 per cent of the country's population. More than 14 million (or 22.2 per cent of the total population) live in the Bangkok Metropolitan Region.

There is a diverse range of ethnic groups within the country comprising three main groups: ethnic Thai (75 per cent), Thai Chinese (14 per cent), and ethnic Malay (three per cent). The remainder of the population falls into small minority groups including hill tribes, Khmers and Mons.

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CONSTRUCTION INDUSTRY AND AGRICULTURE

CONSTRUCTION

The Thai construction industry has suffered two major setbacks to growth during the last five years, firstly from the global economic crisis in 2008-2009 and then from the devastating floods that inundated two thirds of the country's provinces in 2011. Activity levels in the sector declined by 5.3 per cent in 2008 and 2.3 per cent in 2011, although recovered quickly in 2012 with growth of 7.6 per cent, sustained primarily by flood damage reconstruction works and resumption of projects halted by the floods.

Despite the recent political turmoil engulfing the country, the construction industry is expected to continue to progress at a steady pace in the medium to long term, largely supported by measures initiated by the interim military government to develop the industry, with an intention to become the regional hub of the proposed ASEAN Economic Council (AEC) in 2015. Thailand is no longer regarded as a low-cost manufacturing hub, but it remains a key player in the region in various sectors, such as automotive and high-tech manufacturing.

The formation of the ASEAN Economic Community (AEC), with an objective to create a common production base and market for all the ASEAN countries by 2015, represents a huge opportunity for the Thai construction industry, as the market would serve around 600 million people from the region. The proposed AEC is expected to facilitate free flow of goods, services, labour and investment in the ASEAN region. The AEC would benefit Thailand's construction industry tremendously as several industrial, commercial and residential projects would be taken up to cater for the needs of the huge single market.

In addition, there is a need to increase electricity generation capacity in Thailand due to a significant rise in demand. The government has initiated measures to double electricity generation capacity and to take the figure to 70 GW by 2030. The need to match generation capacity with rising demand is expected to drive growth in energy infrastructure.

In June 2014 the National Council for Peace and Order (NCPO) announced a new infrastructure development plan, essentially a reworking of the THB2.2 trillion plan initiated by the former Pheu Thai Party-led government, which was widely criticised as being poorly conceived and was recently ruled as unconstitutional. All transport projects under the original scheme have been reviewed by the NCPO with a view to expediting the implementation of those viewed as priorities. Plans for high-speed train projects worth about THB780 billion have already been shelved by the junta, due to concerns about economic viability, and added aviation improvements, motorways connecting Bangkok to adjacent cities, and dredging projects that combined are budgeted to cost THB1 trillion.

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In addition, the previous government's controversial water management scheme, scheduled for investment of THB350 billion, has been put on hold by the NCPO pending more detailed feasibility studies. This huge scheme, designed to mitigate Thailand's vulnerability to floods, came into existence following the devastating floods in 2011, which the World Bank estimated cost the country up to THB1.44 trillion in losses. The original scheme had been widely criticised for failing to correctly assess the environmental impact of the proposed projects and for being poorly thought out with regard to its effectiveness in tackling flood crisis.

The entire project comprises nine modules, including reservoir construction in the Ping, Yom, Nan, Sakae Krang and Pasak river basins, land utilisation in the Chao Phraya river basin, a flood retention area in Nakhon Sawan, improvements of the Yom, Nan and Chao Phraya rivers and construction of floodways along the Chao Phraya River. Also included in the project are modules for reservoir construction in 17 river basins, land utilisation and town planning, waterway improvements and data management and warning systems.

Infrastructure investment worth up to THB100 billion is expected to begin under the 2015 budget, and is scheduled to include five dual-track railways with a combined length of 767 kilometres, 45 four-lane road projects with a combined length of 14,741 kilometres, and electric train routes in Greater Bangkok. The investment is designed to help the country shift its transportation focus from roads to the more cost efficient railways, reducing the percentage of logistics costs to GDP by two percentage points.

The first dual-track rail line from Nakhon Ratchasima to Chachoengsao could be the first one to proceed as it has already passed the Environmental Impact Assessment and investment is pending approval from the full authoritative government.

The electric trains that are under construction and need investment disbursement under the 2015 fiscal budget are the Purple Line Bang Yai-Bang Sue and the Blue Line Bang Sue-Tha Phra-Hua Lamphong, while the Dark Green Line Mochit-Saphan Mai is awaiting auction. The fates of another two routes – the Yellow Line Lat Phrao-Samut Prakarn and Orange Line Thailand Cultural Centre-Min Buri- depend on how the junta will review details of the projects.

Also among the schemes that are likely to proceed are the Suvarnabhumi and Don Mueang airport expansions, and construction of a new airport in Betong, in Yala province.

The construction sector in Thailand is highly competitive and is dominated by three major companies: CH. Karnchang, Italian-Thai Development (known as ItalThai) and SinoThai. These three companies are diversified builders with the expertise and technology to compete on a global scale, and are active in countries such as Laos,

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Cambodia, Myanmar, Bangladesh, India and elsewhere in Asia. Overall, there are 590 members of the Thai Contractors Association, which includes foreign and local players, but it is estimated that around 10,000 companies actually participate in the market, from constructing new mass transit lines in Bangkok to single-family dwellings in the provinces.

There are 13 contractors listed on the Stock Exchange of Thailand, and reported a combined revenue of THB111.04 billion ($3.5 billion), according to a 2011 report by ItalThai. The three largest were the only ones to report revenue of at least THB10 billion ($319 million) and also capture more than 10 per cent of market share among listed companies. ItalThai led the market with THB44.95 billion ($1.4 billion), giving it 40.5 per cent of the overall market. Sino-Thai, at THB15.02 billion ($479.1 million), has a market share of about 13.5 per cent. CH. Karnchang's THB13.84 billion ($441.5 million) translated into a 12.5 per cent share.

MINING AND QUARRYING

Mining has played a large part in the development of Thailand as a modern industrialised state. The Department of Primary Industry and Mining (DPIM) of the Ministry of Industry (MOI) administers the Minerals Act and issues regulations.

Government policy is to promote private sector development of the Thai mineral industry and considers that all minerals belong to the state, and exploration or mining may not be carried out without a licence. Mineral rights do not include any rights to surface land, and areas including wildlife reserves, national parks, forests and areas reserved for security purposes are closed to exploration and mining activities by law. However, land may be leased for the purpose of exploration and mining.

Foreign mining companies are permitted a 49 per cent participation in Thai mining ventures and must first register their JV company with the Board of Investment (BOI). Minerals policy does not grant mineral rights to foreign entities with more than 49 per cent ownership in a Thai mining venture.

Thailand has a long history of mining and has been an important producer of tin from the late 19th century. The mining industry is now a mature and established sector of the economy and produces gold, silver, copper, iron and steel, lead, manganese, tantalum, tin, tungsten, and zinc metals. Thailand also produces large quantities of industrial, fertilizer and fuel minerals including barite, cement, clay, diatomite, feldspar, fluorspar, gemstones, gypsum, perlite, phosphate rock, salt, sand, stones, talc, zirconium, and coal. The country is no longer able to supply all of its mineral needs from domestic resources and now imports about 20 per cent of its mineral needs by value. It remains an exporter of its surplus production and is a major exporter of gems and jewellery.

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In 2012, Thailand produced 43 types of minerals from 585 active mines, equating to a production value of approximately US$1,880 million. Among these, lignite has the largest share of 31 per cent, followed by aggregate with a share of 18 per cent. In terms of quantity, stone materials were the major products of the industry, accounting for more than three-quarters of the total production volume. Among these, 97 and 66 million tonnes were stone for aggregate and limestone for cement production, respectively. Other minerals with significant production volume included gypsum, dolomite, rock salt and feldspar. Key metal production included iron ore, zinc, and gold.

In 2012, Thailand exported 26 minerals with a total export value of approximately US$906 million. Tin, gold and silver, gypsum and anhydrite were the major exported products and together accounted for 90 per cent of the total mineral export value. Other minerals with significant export values were feldspar, iron ore, zinc metal, rare earth minerals and dolomite.

CURRENT DEVELOPMENTS

POTASH

Potash deposits in Thailand are considered to have high potential for development. In 2012, there were three ongoing applications for potash mining in Udon Thani, Chaiyapoom and Nakhon Ratchasima provinces. Several further applications for exploration licenses were submitted in 2012, covering an area of more than 700 km^2 in Northeastern Thailand.

CEMENT

In 2012, Thailand's clinker production capacity amounted to 50 million tonnes per year. Around 33 million tonnes of cement were produced in the same year from 65.8, 6, and 4.8 million tonnes of limestone, lateritic clay and shale respectively.

COAL

The main lignite production is carried out by the government owned Electricity Generation Authority of Thailand (EGAT) at its massive Mae Moh mine in Lampang province. Its production accounts for around 85-90 per cent of the country's total annual lignite production (2012:18.7 million tonnes). The replacement of four electricity generation plants, which is scheduled to take place by 2018, might affect the lignite demand and the expected mine life. Exploration for coal mining has been carried out by Banpu Public Company Limited covering over 12 km^2 in Chiang Mai province since 2009.

GYPSUM

Thailand is a major gypsum exporter in the region. However, the government's current mining policy does not allow for new gypsum mining licenses. Moreover,

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existing gypsum producers must export their product according to the allocated export quota. Recent prospecting and exploration has been carried out in Surat Thani province.

COPPER

Two copper deposits in Loei province have been explored by Puthep Company Limited, a joint venture between Padeang Industry PLC (Thailand) and PanAust Limited (Australia).

GOLD

Akara Mining Limited, a Thai subsidiary of Australian's Kingsgate Consolidated Limited, is the major gold producer in Thailand. Chatree, Thailand's first and largest modern gold mine, commenced commercial operations in November 2001. The Chatree Mining Complex is comprised of the original Chatree South operation and Chatree North, which began production in November 2008. Since commissioning of the Chatree Mining Complex in 2001, the mine has produced over 1.3 million ounces of gold and over 5.8 million ounces of silver as at June 2013.

FORESTRY

The Royal Forest Department (RFD) was founded in 1896 in Thailand to consolidate the exploitation of forests. As a result, the ownership and control of all forests were transferred from the feudal chiefs to the Government. The RFD was divided into three Departments in 2002: the Royal Forest Department (RFD), the National Park, Wildlife and Plant Conservation Department (DNP) and the Department of Marine and Coastal Resources (DMC). All the departments are under the supervision of the Ministry of Natural Resources and Environment (MNRE)

There are two state enterprises in the forestry sector: the Forest Industry Organisation (FIO) involved in reforestation, teak plantation, sawmilling, and development of forest villages. Fido's subsidiary Thai Plywood Company Ltd produces plywood and other wood products.

In 1961 the total forest area of Thailand was about 27 million hectares covering over 53.3 per cent of the country. Subsequently, forest areas were encroached for the purpose of slash-and-burn, shifting cultivation, land resettlement, dam and road construction, land reform for agriculture, etc. As a result, the share of forest area declined to 25.3 per cent in 1998. From 2000 onwards the annual rate of deforestation has been about 63,000 hectares per year. The current forest area is estimated at 16.8 million hectares (32.7 per cent).

There are two main types of forests in Thailand: **evergreen** forest and **deciduous** forest.

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The evergreen forest is subdivided into tropical evergreen forest, pine forest, mangrove forest and beach forest. Deciduous forest is characterised by the presence of deciduous tree species and is commonly found throughout the country. It is broadly subdivided according to the species composition into the mixed deciduous forest (with and without teak) and the dry dipterocarp forest.

In terms of historical perspective four stages can be identified in the Thai forestry sector:

1. Early exploitation stage (from the mid-1890s to the early 1930s). Logging for commercial purposes started to meet domestic and export demand for teak. The RFD was established to regulate forest exploitation, particularly in the teak forests of the North.

2. Expanding exploitation and management stage (from the 1930s to the early 1960s). Logging became an important economic sector generating foreign exchange, capital for national development, and government revenue, as well as making land available for agriculture. The RFD attempted to bring forest exploitation under management by enacting forest laws, staff training, and enforcement efforts.

3. Forest exploitation decline stage (from the 1960s to the mid-1980s). Logging peaked, export-oriented agriculture expanded, and national economic development gained momentum. Coupled with inefficient control and excessive logging, often illegal, the forests continued to dwindle, at an alarming rate. Desperate measures were introduced to rationalise forest management but were not successful.

4. The struggle towards the sustainable management stage led to a logging ban (from 1989 onwards) as a result of widespread awareness of the adverse effects of forest exploitation. The forest had declined to a point where the government had to decide that what remained must be kept for conservation rather than for further exploitation.

No relevant statistics exist in the country on wood production. There are two main sources of industrial wood: eucalyptus plantations and rubber plantations. The rubber tree was first introduced in 1900 in south Thailand and in 1908 in eastern Thailand, and rubber planting has been actively promoted by the government since the 1960s. Due to the logging ban, there is practically no timber production in natural forests.

Because of their astonishing growth characteristics, climatic adaptability and wide ranging usefulness, eucalyptus trees are increasingly being regarded as amongst the most important species available for economic utilisation. In Thailand, 70-80 per

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cent of eucalyptus produced goes to the paper and pulp industry, 10-15 per cent is used for charcoal and five per cent is used for construction poles, etc. Manufacturing of MDF, hardboard and particleboard from eucalyptus has also been taken up by some companies. Eucalyptus is also used by the Electricity Department as a source of biomass energy.

The area of natural teak forest in Thailand decreased from 2,324,300 hectares in 1954 to about 150,000 hectares in 2000, mostly due to the demand for agricultural land and construction wood by the increasing human population. Over-exploitation, often illegal, was also an important factor. Thailand, therefore, has to import teak wood, especially from Myanmar, Laos and Indonesia, with an average value of about US$50 million annually. However, small logs from domestic teak plantations are used for furniture, building construction, household utensils, toys, poles, etc. for domestic consumption as well as for export.

All forests in Thailand are owned by the state whereas all trees established on private lands are private property. Since logging in natural forests is banned, timber production in Thailand has shifted from natural forests to planted forests, particularly teak and rubber wood and non-forest sources supplemented by imports. But planting of timber species has progressed slowly due to a series of constraints. Most farmers are poor and therefore they have to obtain quick returns and even a five-year rotation with eucalyptus is often too long for them. This has led many farmers to apply only three to four year rotations with resulting loss of timber yield. Thus, they prefer to raise agricultural crops for seasonal regular revenue and tree crops are usually complementary to these sources of income. Only rich and large-scale farmers can wait for the returns at the maturity of the timber species.

In spite of its limited economic forest resource base, Thailand has been able to develop an extensive forest industry, which can meet most of the country's domestic demand. The largest segments of the industry in terms of production volume are pulp and paper, sawmilling and particleboard. With the exception of plywood and veneer, the Thai industry is a significant export supplier in all products in spite of rapidly increasing domestic demand. A particular element in the Thai domestic timber demand is the consumption of the export-oriented furniture industry, which is a major consumer of sawn wood, particleboard and MDF.

Imports play a key role in meeting the demand for sawn wood and plywood. About two-thirds of sawn wood consumption is imported, mostly for building construction, as this end-use market cannot be served by rubber wood, the mainstay of the Thai sawmilling industry. The limited supply of good quality large-sized logs is a constraint for the plywood industry and therefore imports account for 28 per cent of the apparent consumption.

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Thailand's main export items in wood products are sawn wood, particleboard and fibreboard. The volume of export trade has developed significantly in recent years as a result of the growing interest of Chinese furniture producers to procure sawn rubber wood from Thailand. Rubber wood now accounts for over 95 per cent of the country's total sawn wood exports and China represents around 80 per cent of this.

AGRICULTURE

Agricultural development in Thailand since 1960 has facilitated the country's transformation into an urbanised economy based around manufacturing. There have been two phases: rapid agricultural growth based on utilisation of underused land and labour; and, as Thai farming began to shed land and labour, slower but continued growth through higher productivity.

From the 1960s to the early 1980s new lands were opened up for farming, facilitated by the existence of a forest frontier where squatting was tolerated. This absorbed growing labour to produce more of the main staples for both the domestic market and export (rice and teak in the first place). At this time, agriculture was the main driver of the economy. More than 70 per cent of the active population was employed in the sector in 1980, among them the vast majority of the poor.

Agriculture then began to transform, as Thailand experienced rapid economic growth led by manufacturing. Labour began to leave agriculture, attracted by jobs in manufacturing, urban services and the rural non-farm economy. At the same time, it was becoming harder to open up new land. Agricultural growth slowed, but productivity of land and labour increased notably. The sector became more mechanised and more capital intensive, facilitated by increasing availability of formal credit.

With some 20.4 million hectares (50.4 million acres) of farm land, of which about 10 million hectares (24.7 million acres) are under rice cultivation, Thailand continues to rely heavily on agriculture, although the country has suffered from declining export prices in recent years. Rice is the major crop grown, with the main commercial rice-producing areas of Thailand being the Chao Phraya basin and the Khorat Plateau. Total rice production exceeded 30 million tonnes in 2012. Thailand has been the world's biggest rice exporter for many years, although in 2012 was overtaken for the first time by India and Vietnam. In recent years the government has embarked on large-scale irrigation projects and introduced higher-yielding varieties of rice in an effort to increase production.

Rubber, also a major export, is grown on the peninsula and, to a lesser extent, on the southeast coast. Sugarcane production reached approximately 100 million tonnes in 2013, while output of cassava (tapioca), traditionally important in Thailand, totalled around 25 million tonnes.

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Thailand provides about 95 per cent of the world's cassava exports. Much of the harvest is processed into chips and pellets and exported to the EU for fodder. Higher EU tariffs, however, have caused the Thai government to promote dairy, fruit, rubber, and cashew farming instead. One third of corn production, which has increased significantly in recent decades, is consumed annually as fodder, with the remainder being exported to Europe and Japan.

Kenaf, tobacco, cotton, and kapok are cultivated mainly for domestic use, but quantities of jute, cocoa, peanuts, soybeans, and medical plants are exported. Canned pineapple and fresh flowers, especially orchids, are important exports. The Thai government's official policy of encouraging mountain villagers to grow coffee, apples, strawberries, kidney beans, and other temperate crops instead of the lucrative opium poppy and marijuana has had some success; another aim of the project is to discourage deforestation through slash-and-burn cultivation.

In the mid-1970s, farmers began to organise to express their discontent over the disparity between farm and non-farm incomes. To improve farm conditions, the government legitimised squatters' rights to nearly 500,000 hectares (1,236,000 acres) of land classified as forest reserve and established credit and crop insurance programs for farmers. The government Marketing Organization for Farmers, founded in 1975, allows farmers to buy fertilizers, machinery, and equipment at the lowest possible prices and assists in crop marketing. It is also government policy to channel revenues from agricultural export taxes to a welfare fund called the Farmers Assistance Fund.

The northeast of Thailand has long been known for its water buffalo and cattle. As agriculture became increasingly mechanised, the demand for water buffalo, once used for ploughing and harrowing, decreased markedly. However, cattle production in the northeast has increased because of a significant rise in demand for beef in urban areas. The northeast is also a major producer of pigs, to meet a growing demand for pork.

Chicken production expanded dramatically since the mid-20th century, but increasingly it has been undertaken in central Thailand by companies rather than by smallholders. The outbreak of bird flu (avian influenza) in Southeast Asia in the early 21st century prompted the government on several occasions to order the destruction of large numbers of chickens, leading to an overall decline in poultry production and heavy revenue losses for producers. Chickens and smaller numbers of ducks continue to be raised for the domestic market.

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EQUIPMENT ANALYSES

AGRICULTURAL TRACTORS

MARKET SIZE AND TRENDS

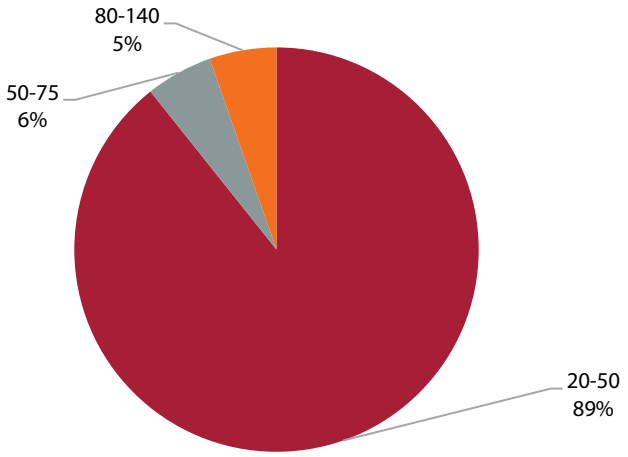
As recently as 2004 the total tractor market amounted to just 2,700 units, characterised by Japanese products in the 20-30 horsepower class and Western tractors of 80 horsepower. As the figures below show, there has been a revolution since then and it has happened primarily in the compact tractor sector under 50 horsepower. Kubota, the market leader in compact tractors, power tillers and engines, embarked on a strategy of offering lower cost wheeled tractors on very flexible terms of payment in 2004. It has concentrated its efforts on a 34 horsepower model with an 8x4 crash gearbox and a 540-750 rpm pto. Whilst competitors have decried it as being out-of-date, it is clearly what the market wants, especially the flexible payments that enable a farmer to delay final payment for the tractor until he receives the income from his harvest.

Table 11. Thailand: Sales of Agricultural Tractors by Horsepower, 2009-2013

	2009		2010		2011		2012		2013	
Horsepower	Units	%	Units	%	Units	%	Units	%	Units	%
20-50	22,400	91	20,200	90	22,000	90	24,000	89	20,000	90
50-75	1,200	5	1,100	5	1,200	5	1,500	6	1,200	5
80-140	1,100	4	1,250	5	1,200	5	1,400	5	1,200	5
Total	**24,700**	**100**	**22,550**	**100**	**24,400**	**100**	**26,900**	**100**	**22,400**	**100**

Source: Off-Highway Research

Chart 5. Thailand: Sales of Agricultural Tractors by Horsepower, 2013



Source: Off-Highway Research

The effect on the market under 50 horsepower has been dramatic and Yanmar, which had been considering CKD assembly in Thailand, reacted with a major campaign to sell a version of the sophisticated products devised for other markets. Chinese competitors have also made an entry with cheaper alternatives, but poor

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reliability and service support issues meant they have achieved very little market penetration.

The next sector where any sales used to be made was 70 horsepower, frequently government tenders for items like tractors for grass mowing on the highways. That changed in 2005, when two importers began selling the John Deere agricultural tractors made in India. In the space of two years 2,000 units were shipped to Thailand, with a concentration on a 53 horsepower model, mostly 2WD but with a 4WD option and a 9x3 transmission. This created a new market sector, and annual sales have grown to 800-1,000 units.

The next significant volume sector is in 90 horsepower units for cash crop farmers, especially the sugarcane growers in the north, and farmers growing hay and barley for brewing. Ten years ago the sector was dominated by products with a simple synchromesh gearbox from plants in Mexico or Brazil but one supplier, the New Holland importer, successfully expanded the market with a locally assembled product with a crash gearbox. Sales have risen in the sector from 300 to about 1,200 units per year.

Tractors above 100 horsepower sell in very small volumes in Thailand. Sugarcane farming is the prime market for these higher horsepower agricultural tractors, with approximately 100,000 small holders growing it. In recent years, growth in sugar production has come largely from area expansion in the North and North East of the country. The sugar industry has done extremely well in the past decade, thanks to high cane prices, greater stability and confidence in the industry, successful government initiatives in mill relocation and expansion and favourable weather. Moreover, Thailand is presently one of the five largest global sugar exporters, with relatively small internal needs for sugar and low shipping costs, especially to growing regional markets. The government policy of maintaining high domestic sugar prices has supported increased production, dampened growth in use and increased exportable surpluses. Sugarcane therefore presents a totally different customer profile from the rice farmers, who work with hand labour or power tillers.

The import of used agricultural tractors has historically been a major business, with Japan being the source for small tractors and Europe for larger types. It is estimated that the used tractor market could be up to twice the size of the new tractor market.

PRODUCTION

In 2003 Anglo-Thai, the importer of New Holland tractors established an assembly facility for agricultural tractors in Bangpa-in. The loss of the New Holland franchise in 2011, however, has meant that the facility has now been closed. Its AT series was created to deliver a lower priced, lower specification tractor for Thai farmers, at a time when European and American tractors have become too sophisticated and

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expensive for the local market. It used locally sourced sheet metal deliberately designed to look like the familiar British New Holland tractors of 10 years ago. At its peak the production of the AT series ran at approximately 400 units a year and accounted for about half of the tractors sold by the Anglo-Thai network.

In September 2007 **Kubota** established a new manufacturing venture, Siam Kubota Tractor Co. Ltd, at Amata Nakorn industrial estate in Chonburi to produce tractors locally. Annual capacity at the plant is 50,000 units. In August 2010 The Siam Kubota Industry Co. Ltd merged with Siam Kubota Tractor Co. Ltd to become Siam Kubota Corporation Co. Ltd. The new company was established with a registered capital of THB3,114 million and is a joint venture between Kubota Corporation of Japan, which holds a 60 per cent shareholding, and Siam Cement Group, which has a 40 per cent shareholding.

Kubota Japan has already stated its intention to make Siam Kubota the centre of its full-line agricultural machinery business in Asia, and during recent years has invested massively in its Thailand joint venture operation. In 2011 it also began production of rice combine harvesters at the Chonburi plant. Revenue from the Thai subsidiary reached THB70 billion in 2013.

In February 2011 **Yanmar** built a new assembly plant for compact tractors on the site of its existing engine manufacturing factory in Lad Krabang, near Bangkok. The new facility was conceived in recognition of the importance of the expanding Thai market and has an annual production capacity of 15,000 units. Production in 2013 exceeded 8,000 units. The combined workforce in both plants is 650 people.

MARKET SIZE AND TRENDS

There are two major two sectors in the market with totally different profiles. The market **under 50 horsepower** belonged almost entirely to **Kubota** before 2004 and it is still commanding a very high market share of over 70 per cent. The manufacturer has a very powerful commercial partner in the form of Siam Kubota, in which it has a financial interest. It has the added benefit of a local production plant for tractors.

It tried unsuccessfully to sell standard export specification tractors from Japan in the 45 and 80-90 horsepower sectors, but in 2002 it launched a basic specification 26 horsepower model with an 8-speed constant mesh transmission and engine-driven PTO. It subsequently launched a range of six basic specification models from 24 horsepower upwards with much lower selling prices. 24, 28 and 34 horsepower types appeared between 2004 and 2006, followed more recently by other models up to 100 horsepower. The Amata Nakorn plant currently produces all models below 50 horsepower, with the larger machines up to 135 horsepower being imported from Japan

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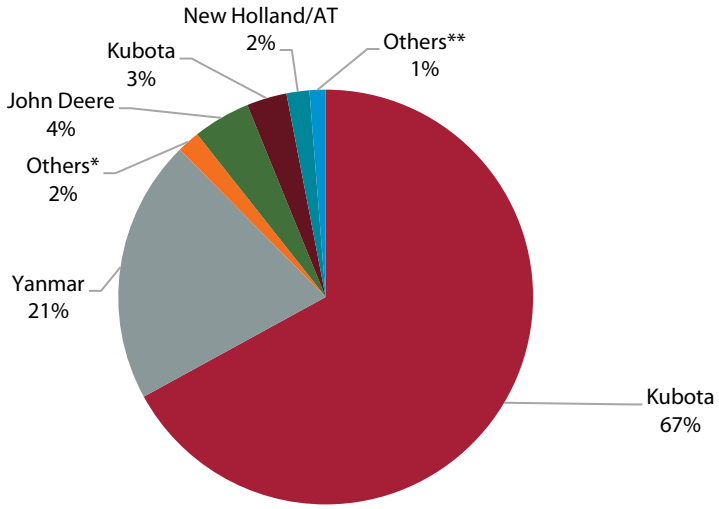
Table 12. Thailand: Suppliers of Agricultural Tractors and Their Market Shares by Type, 2012-2013

	2012		2013	
	Units	%	Units	%
Under 50 Horsepower				
Kubota	17,250	72	15,000	75
Yanmar	6,250	26	4,600	23
Others*	500	2	400	2
Sub-Total	**24,000**	**100**	**20,000**	**100**
Over 50 Horsepower				
John Deere	1,100	38	1,000	42
Kubota	950	33	700	29
New Holland/AT	550	19	400	17
Others**	300	10	280	12
Sub-Total	**2,900**	**100**	**2,400**	**100**
Total	**26,900**	**100**	**22,400**	**100**

* Includes Nagano, Iseki, Mitsubishi and Chinese producers
** Includes Chinese producers, Massey Ferguson, Escorts and Landini
Source: Off-Highway Research

Chart 6. Thailand: Suppliers of Agricultural Tractors and Their Market Shares by Type, 2013



Source: Off-Highway Research

Besides convincing power tiller users to upgrade to a wheel tractor with draft control, Kubota has also destroyed part of the market for used tractors (paradoxically many from Japan). In 2006 the company founded a formal leasing company but undeniably the success of the tractor programme has been linked to super flexible payment terms since 2004, which in effect allows rice farmers to pay when the harvest has arrived.

The example of Kubota in changing the market has been a spur to action in **Yanmar** but it has opted for a small number of models from 20 to 45 horsepower with full equipment such as synchromesh and draft control. The importance of the Thai market encouraged Yanmar to build a new plant specifically for tractor production, which it opened in February 2011 in Lad Krabang, near Bangkok. It is also

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convincing power tiller users to upgrade to a wheel tractor with draft control, but does not offer quite the super flexible payment terms that its rival does since 2004.

The remainder of this market goes to a locally made product called **Nagano** and various Chinese tractors. The Nagano product appears to be a copy of a Mitsubishi tractor with Thai bodywork and a Japanese sounding name.

In the market for tractors **over 50 horsepower** the picture is entirely different, and the market has developed into two separate segments recently. **John Deere** has opened up a market for 55 horsepower tractors from its Indian plant, while **New Holland** and, more recently **Kubota**, dominate the market for tractors of 90 horsepower and more.

In 2003 Deere had a small volume passing through a single dealer in Bangkok, but the opening of the Indian plant and some availability from Latin America transformed its position. The original dealer reorganised to allow a subsidiary to market Indian tractors from 40 to 60 horsepower, while Deere also allowed a second importer, more involved in parts and implements, to market the same product with a slightly different identity. In 2012 the growing importance of the Thai market encouraged John Deere to establish its own subsidiary company in Bangkok and both importers were compelled to renounce the company's franchise.

New Holland works in a sector of more powerful tractors and, until the rapid growth of Kubota in this size class, had an overwhelming dominance of its own corner. This position goes back to the control of the market in the 1980s by British-made Ford tractors, as sold by Inchcape Engineering, which has become Anglo-Thai.

The full list of suppliers is shown below.

Table 13. Thailand: Distribution Networks of Agricultural Tractors, 2014

Manufacturer	Distributor
Escorts	Chonburi Central Tractors
Jinma	Champ
John Deere	John Deere Thailand
Kubota	Siam Kubota
Landini	Phong La-Or Patana
Massey-Ferguson	Anglo-Thai
Nagano	Thai Tavonkolkarn
New Holland	Apam
Yanmar	Yanmar Agricultural Machinery Thailand

Source: Company Information

For tractors under 50 horsepower the long-time market leader, **Siam Kubota** has a network of over 200 authorised dealers backed by mobile service units. **Yanmar**, in seeking to challenge the Kubota monopoly, has deployed a network of 40 authorised dealers covering and nine service centres, originating from its engine business. In

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larger tractors the most significant networks are those of **New Holland**, **John Deere** and **Kubota**.

POPULATION AND END-USERS

The agricultural census does not chart wheeled agricultural tractors with any degree of accuracy, so the population estimate has to be made on the basis of the record of imports, which are estimated to be up to twice the volume of new tractors sold annually. According to the leading suppliers interviewed for the purposes of this study, the current population of tractors is approximately 250,000 units.

What is more important to remember is that, although the market for four wheel tractors is growing rapidly, they still face competition in some areas from traditional Thai farming methods. The country still has a large population of water buffaloes, the obvious source of draft power for a small rice grower, and around 2 million walk-behind tractors which account for annual sales of around 100,000 units.

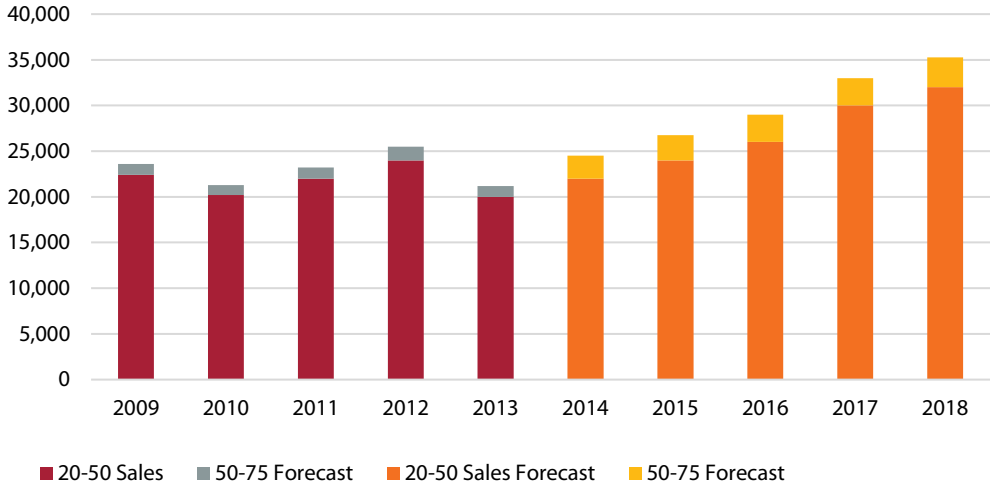
FORECAST

Table 14. Thailand: Forecast Sales of Agricultural Tractors by Horsepower, 2014-2018

	2014		2015		2016		2017		2018	
Horsepower	**Units**	**%**	**Units**	**%**	**Units**	**%**	**Units**	**%**	**Units**	**%**
20-50	22,000	90	24,000	90	26,000	90	30,000	91	32,000	91
50 and Over	2,500	10	2,750	10	3,000	10	3,000	9	3,250	9
Total	**24,500**	**100**	**26,750**	**100**	**29,000**	**100**	**33,000**	**100**	**35,250**	**100**

Source: Off-Highway Research

Chart 7. Thailand: Forecast Sales of Agricultural Tractors by Horsepower, 2009-2018



Source: Off-Highway Research

The outlook for sales of new agricultural tractors appears highly favourable and there is little reason to believe that the growth witnessed during the last three years

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cannot be continued for at least the next five years. The availability of favourable payment terms offered by the leading manufacturers has created a climate in which farmers are questioning the need to buy used tractors when the purchase of a new machine has become increasingly viable. Prices for crops such as sugar cane, rice, coffee, palm oil and rubber are at record levels and have benefited from government price protection policies aimed at increasing the income of Thai farmers. In addition, the government has supported the trend towards mechanisation in Thai agriculture in order to boost the output of sugar cane and rice in particular, and this will continue to underpin buoyant growth in the new tractor market.

The government is also encouraging the use of biodiesel, a primary ingredient of which is molasses produced from sugar cane, which has added further stimulus to the investment in new machinery. Similarly, the production of bioplastic is set to increase and will also contribute to increased mechanisation in farming.

An interesting recent development has been the increasing number of Middle East investors buying rice paddies in Thailand. This new breed of farmers are planting their own rice and re-exporting it back to their home countries. They do not use agricultural contractors and their high purchasing power has also been a significant contributory factor in the recent growth in tractor sales.

The trend towards the use of four wheel drive tractors seems set to continue as farmers become increasingly aware of the versatility, and therefore viability, of these machines. Much of the growth in the market will continue to come from the under 50 horsepower sector, although sales of larger tractors will also increase, albeit at a reduced rate.

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MACHINES AVAILABLE

Table 15. Thailand: Agricultural Tractors Available, 2014

Manufacturer	Model	HP	Manufacturer	Product Source
John Deere	5103	40	Deere	India
	5203	47	Deere	India
	5310K	55	Deere	India
	5310	58	Deere	India
	5610	70	Deere	India
	5715	86	Deere	Mexico
	6603	121	Deere	Mexico
	6525	130	Deere	Germany
Kubota	B2410	24	Kubota	Thailand
	L2808	28	Kubota	Thailand
	L3408	34	Kubota	Thailand
	M5000	50	Kubota	Thailand
	M9000	92	Kubota	Thailand
	M9540	95	Kubota	Thailand
	M105S	105	Kubota	Thailand
Massey Ferguson	445	85	Perkins	Brazil
New Holland	TC28R	28	New Holland	Korea
	TC38R	38	New Holland	Korea
	TC48R	47	New Holland	Korea
	TL90	90	New Holland	China
	TT55	55	New Holland	India
	TS6000	90	New Holland	Brazil
	TS6020	110	New Holland	Brazil
Yanmar	EF312T	31	Yanmar	Thailand
	EF352T	35	Yanmar	Thailand
	EF453T	45	Yanmar	Thailand

Source: Company Information

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ASPHALT FINISHERS

MARKET SIZE AND TRENDS

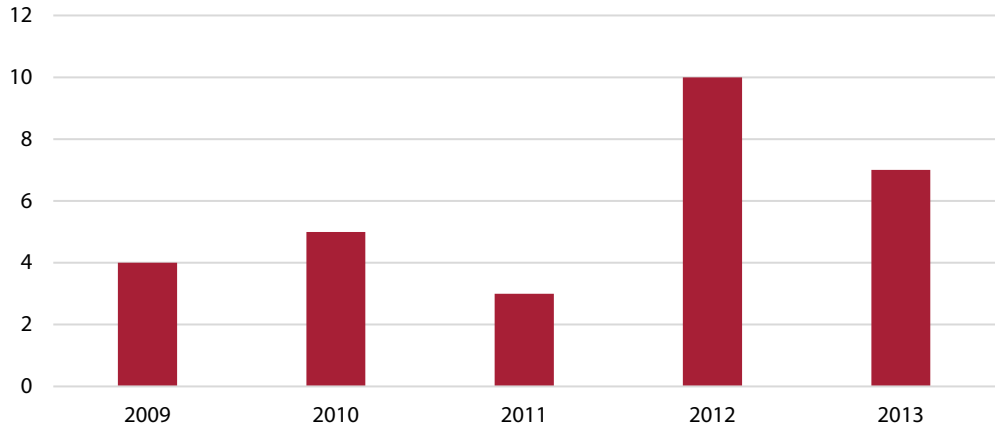
After the Asian financial crisis in 1997 the possibility of selling any new asphalt finishers disappeared until 2000, then 13 units were sold over the next three years. All interest in new asphalt finishers then disappeared until a single unit was bought in 2006. No sales were recorded in 2007 or 2008, but the implementation of the government's Thai Khem Khaeng stimulus package in 2009-2010 prompted orders for nine new finishers. Flood reconstruction projects in 2012 and 2013 stimulated demand once more when 17 units were delivered.

Table 16. Thailand: Sales of Asphalt Finishers, 2009-2013 (Units)

2009	2010	2011	2012	2013
4	5	3	10	7

Source: Off-Highway Research

Chart 8. Thailand: Sales of Asphalt Finishers, 2009-2013 (Units)



Source: Off-Highway Research

The market for new finishers has traditionally been suppressed by the demand for imported used finishers, often supplied as reconditioned units through official channels, sales of which run at a rate of 20-30 units per year. In past years the used sector was traditionally furnished by imports from Japan, but more recently prices of these machines have escalated to the extent that most imports of used finishers now come from Germany. In many cases the machines have been fully refurbished by the manufacturer and are offered with a comprehensive warranty and genuine spare parts back-up, a major selling point for Thai customers, many of whom have reported bad experiences with fake spare parts on second hand pavers. During the last three years, however, increasingly stringent specifications for road building have encouraged a trend towards the purchase of new, high technology pavers from Western suppliers and away from lower specification used machines imported from Japan.

The market leader, Vögele, sells mainly to private contractors, although machines are also delivered to the government sector, and are divided between the

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municipalities doing repairs and therefore wanting wheeled machines with variable screeds, and those like the Department of Highways that are looking for crawler machines. Screeds do not extend to the largest sizes and most have a maximum working width of eight or nine metres. The most popular sizes of finisher sold in Thailand are the Vögele Super 1800, which is mainly used in the north of the country where more demanding paving applications necessitate the use of larger machines, and the smaller Vögele Super 1600, which is primarily used in inner city applications.

PRODUCTION

No local production.

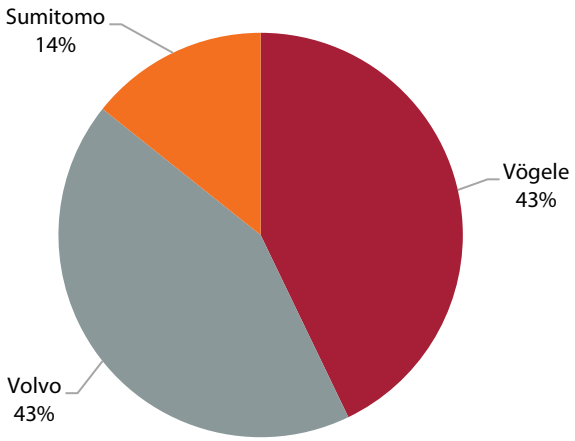
MARKET SHARES

Table 17. Thailand: Suppliers of Asphalt Finishers and Their Market Shares, 2012-2013

	2012		2013	
	Units	%	Units	%
Vögele	9	90	3	43
Volvo	1	10	3	43
Sumitomo	-	-	1	14
Total	**10**	**100**	**7**	**100**

Source: Off-Highway Research

Chart 9. Thailand: Suppliers of Asphalt Finishers and Their Market Shares, 2013



Source: Off-Highway Research

The market for new asphalt finishers remains very small and the franchised dealers have come to rely on the supply of used machines, after sales service and replacement parts. The market leader, Wirtgen, actively promotes the sale of refurbished pavers from its German factory and offers comprehensive warranties and service back-up.

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The full list of potential suppliers is shown below, although in reality the only active companies are Vögele, Volvo and, more recently, Bomag and Sumitomo.

Table 18. Thailand: Distribution Networks of Suppliers of Asphalt Finishers, 2014

Manufacturer	Distributor
Ammann	Ariya Equipment
Bomag	DKSH
Caterpillar	Metro Machinery
Dynapac	MEC Far East Corporation
Sumitomo	Leadway Heavy Machinery
Vögele	Wirtgen Thailand
Volvo	Italthai Industrial

Source: Company Information

Wirtgen Thailand took over the **Vögele** franchise from Vasko Trading in 1998. Since then it has become the acknowledged market leader in selling both new and used asphalt finishers. The company's main line in Thailand is cold recycling units of very high value, far more valuable than the asphalt finishers and compaction equipment with which this report is concerned.

The **ABG** brand is well known in Thailand and was with Italthai Industrial for many years prior to the manufacturer's acquisition by **Volvo**. Its long established presence in the country means that it is effectively the only real competitor to Vögele. **Bomag**, sold by DKSH (Thailand), and **Sumitomo**, sold by Leadway Heavy Machinery, are the only other suppliers to have recorded any sales during the period under review. **Dynapac** has been with MEC Far East Corp. since 1990, which markets used asphalt finishers reconditioned by the Dynapac factory in Germany.

The used asphalt finisher market is partly supplied with used machines from Japan (Sumitomo and Mitsubishi) but the technical reputation of German machines is such that the most sought after machines are reconditioned units from Europe. The leading outlets for them are Wirtgen Thailand, Vasko Trading (a former holder of both the ABG and Vögele franchises) and Italthai Industrial.

POPULATION AND END-USERS

The population is estimated at 500 units. The main end-user segments are the specialist private contractors, many of whose work involves maintenance of the existing road network, and state road departments at various levels.

FORECAST

There is virtually no requirement for new road building in Thailand and maintenance and extensions of the existing network are the primary application of the asphalt finisher. The lack of a large replacement market means that sales of new machines are unlikely to fluctuate significantly during the period under review. However, the military government's recently approved infrastructure investment

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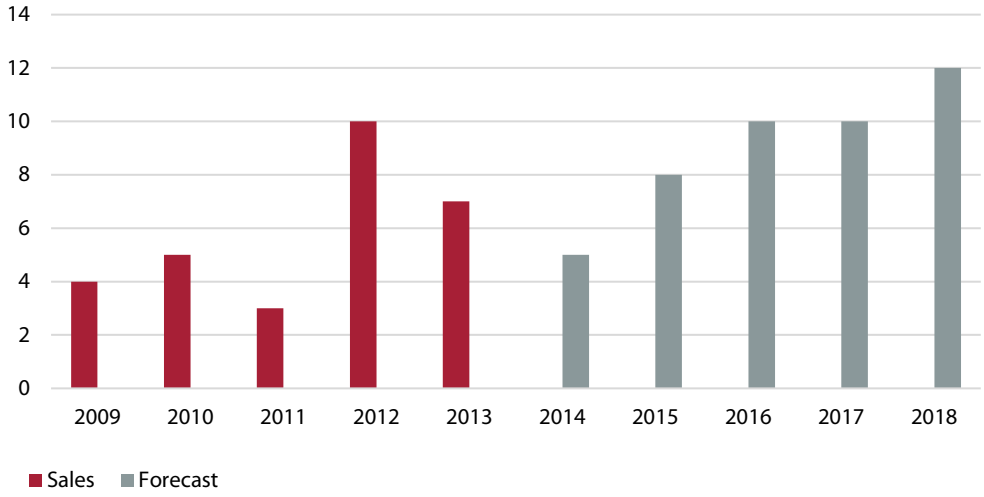
plan comprising up to 45 four lane road projects totalling a distance of 14,700 kilometres, together with expansion of Suvarnabhumi and Don Mueang airports and construction of a new airport at Betong, should sustain consistent demand for new pavers in the medium to long term.

Table 19. Thailand: Forecast Sales of Asphalt Finishers, 2014-2018 (Units)

2014	2015	2016	2017	2018
5	8	10	10	12

Source: Off-Highway Research

Chart 10. Thailand: Forecast Sales of Asphalt Finishers, 2009-2018 (Units)



Source: Off-Highway Research

MACHINES AVAILABLE

The table below shows the machines available. The ranges shown are the full programmes of the manufacturers with permanent representatives but not all of them correspond to the likely needs of the market.

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Table 20. Thailand: Asphalt Finishers Available, 2014

Manufacturer	Model	Type	Paving Width (Metres)	HP	Manufacturer	Product Source
Bomag	MF704	C	2.5-6.2	126	Deutz	Italy
	MF905	C	2.5-8.1	161	Deutz	Italy
	MF1005	C	2.5-8.1	181	Deutz	Italy
Caterpillar	AP-650B	C	2.4-8.0	125	Caterpillar	Italy
	AP-1055D	C	3.1-13.0	222	Caterpillar	Italy
	AP-800D	W	2.4-8.0	130	Caterpillar	Italy
	AP-1000D	W	3.1-13.0	222	Caterpillar	Italy
Dynapac	F6C/DF65C	C	1.7-4.4	71	Deutz	Germany
	SD2500CS	C	2.0-10.0	193	Cummins	China
	SD2550CS	C	2.0-14.0	264	Cummins	China
	F161-8W	W	2.5-9.0	208	Cummins	Germany
Sumitomo	HA60C-7	C	2.3-6.0	120	Isuzu	Japan
	HA60W-7	W	2.3-6.0	120	Isuzu	Japan
	HA90C	C	3.0-7.5	177	Isuzu	Japan
Vögele	Super 1600	C	2.5-8.0	134	Perkins	Germany
	Super 1800	C	2.5-10.0	174	Perkins	Germany
	Super 1603	W	2.5-7.0	134	Perkins	Germany
	Super 1803	W	2.5-8.0	174	Perkins	Germany
Volvo	ABG 5820	C	2.5-8.0	152	Deutz	Germany
	ABG 7820	C	2.5-10.0	231	Deutz	Germany

Source: Company Information

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BACKHOE LOADERS

MARKET SIZE AND TRENDS

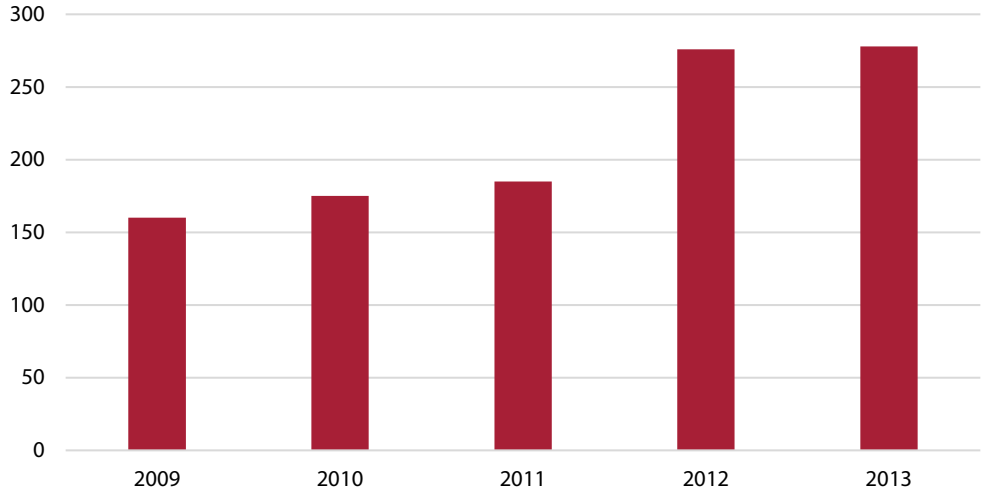
Demand for backhoe loaders has not progressed to the same extent as heavy equipment, and the product suffers from the fact that it is viewed by Thai contractors as a finishing tool rather than a mainline production machine like the 20 tonne crawler excavator.

Table 21. Thailand: Sales of Backhoe Loaders, 2009-2013 (Units)

2009	2010	2011	2012	2013
160	175	185	276	278

Source: Off-Highway Research

Chart 11. Thailand: Sales of Backhoe Loaders, 2009-2013 (Units)



Source: Off-Highway Research

Political and economic uncertainty at the beginning of the review period undermined buyers' confidence and demand shrunk back to just 134 units in 2008. The subsequent two years saw the beginning of a modest recovery, albeit somewhat slower than suppliers may have hoped for, and was bolstered in 2012 by flood reconstruction projects, and in 2013 by the award of a large government tender.

In the past buyers gave preference to the two wheel drive type with a simple boom, but now the demand has swung in favour of the four wheel drive machines, which typically account for 90 per cent of sales. The boom is still not usually of the telescoping type, except where machines are specified for water irrigation applications, and in general the specification is in the middle of the range of possibilities. One exception in past years has been the heavier, more powerful JCB 4CX, which has won a small following in the government sector. In more recent times the importer has turned to the less expensive 3CX Super which still features four equal size wheels but with a price that is more attractive to the government departments. Private contractors and rental companies sustain demand for the standard four-wheel drive machine, which typically accounts for around 50 per cent

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of overall sales. There is virtually no demand for smaller backhoe loaders such as the JCB 2CX or 1CX.

PRODUCTION

In 2005 Bangkok Komatsu began assembly of kits of backhoe loader parts imported from Italy. The intention was to sell them mainly in Malaysia, but the project did not work well and the assembly has been terminated.

MARKET SHARES

JCB has come to dominate this market in recent years. It has been selling in Thailand through various subsidiaries of the Siam Group since 1979. Since 2001, however, it has been with Siam Motor Parts Co. Ltd, which has been active in the motor parts market since 1989. The dealer regularly achieves a market share of 60 per cent in the backhoe loader sector and markets the products to the municipalities doing maintenance throughout the country and, increasingly, to rental companies and private contractors. The wealthier government buying departments favour the 3CX Super model with equal sized wheels, and this machine typically accounts for up to 40 per cent of the company's annual backhoe loader sales. The 3CX 4WD model is the most popular model, accounting for around 50 per cent of sales, and is favoured by the private contractor sector, whilst the 2WD version is sold in smaller quantities to rental companies.

The company's main service centre is at Khet Prawet, outside Bangkok. It has a warehouse of 4,500 m^2 and offices of 2,106 m^2. There are additional company branches in Rayong, Surat Thani, Chiang Mai, Khon Kaen and Nakhon Ratchasima. In 2014 it will open new branches in Udon Thani and Phitsanulok.

JCB's most effective challenger is now **Caterpillar**. The dealer, Metro Machinery, has a big sales force and although a few years ago it made few backhoe loader sales, it now does very well with some products from the lower end of the Caterpillar range, specifically its 422E model.

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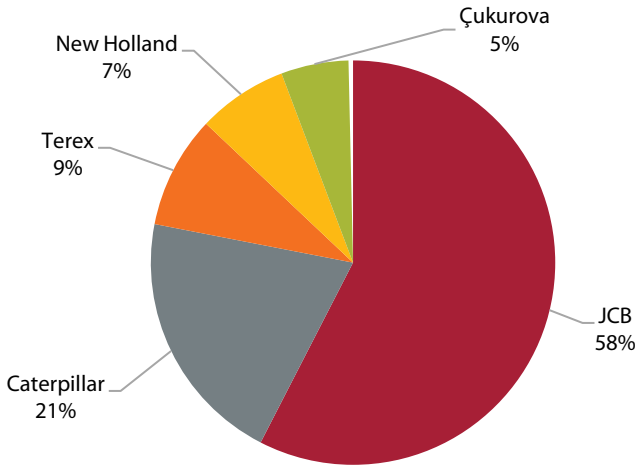
Table 22. Thailand: Suppliers of Backhoe Loaders and Their Market Shares, 2012-2013

	2012		2013	
	Units	%	Units	%
JCB	138	50	160	58
Caterpillar	74	27	57	20
Terex	25	9	25	9
New Holland	20	7	20	7
Çukurova	15	5	15	5
Volvo	1	-	1	-
John Deere	2	1	-	-
Shandong Lingong	1	-	-	-
Total	**276**	**100**	**278**	**100**

Source: Off-Highway Research

Chart 12. Thailand: Suppliers of Backhoe Loaders and Their Market Shares, 2013



Source: Off-Highway Research

Terex backhoe loaders are imported by the Hyundai dealer, AVN Motor Works, who in the past has also sold Chinese made machines from SEM and Changlin. AVN now concentrates on the Terex products, which are sourced from India, although with effect from 2014 has also begun to market the Hyundai backhoe loader range.

Three recent new entrants to the sector have been the Turkish manufacturers, **Hidromek** and **Çukurova**, and the Chinese manufacturer, **Shandong Lingong** (SDLG), distributed by the Volvo dealer Italthai Industrial. **New Holland**'s Italian built backhoe loaders were previously sold by the agricultural dealer Anglo-Thai, but in September 2009 the franchise was transferred to a new dealer, Empire Tech, in Bangkhunkong. **Case** entered the market in the first half of 2014 with the appointment of TLS as its dealer, but has yet to make any sales.

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Table 23. Thailand: Distribution Networks of Backhoe Loaders, 2014

Manufacturer	Distributor
Caterpillar	Metro Machinery
Çukurova	Paragon Machinery
Hidromek	Krung Thai Tractor
Hyundai	AVN Motor Works
John Deere	Hitachi Construction Machinery (Thailand)
JCB	Siam Motor Parts
LiuGong	Yontrakarn Machinery
New Holland	Empire Tech
Shandong Lingong	Italthai Industrial
Terex	AVN Motor Works
Xiagong	Siam Sun Auto

Source: Company Information

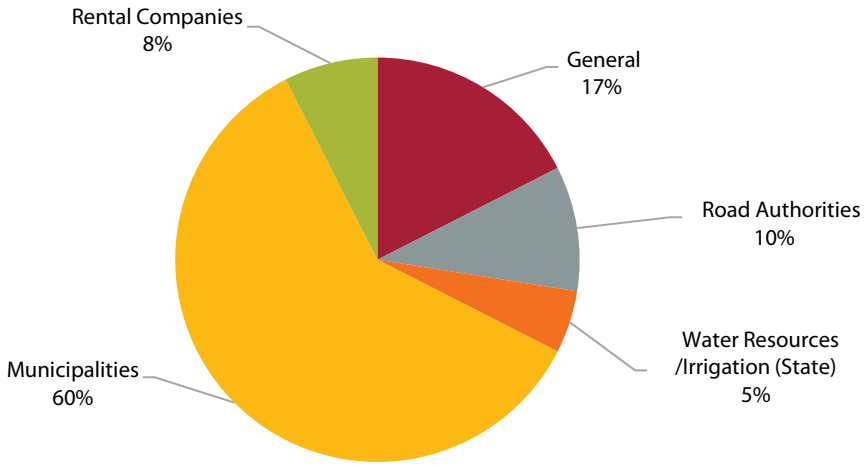
POPULATION AND END-USERS

Table 24. Thailand: Population of Backhoe Loaders by Type of User, 2014

	Units	%
Construction		
– General	350	17
– Road Authorities	200	10
– Water Resources/Irrigation (State)	100	5
Municipalities	1,200	60
Rental Companies	150	7
Total	**2,000**	**100**

Source: Off-Highway Research

Chart 13. Thailand: Population of Backhoe Loaders by Type of User, 2014



Source: Off-Highway Research

The population has remained at the level to which it had grown before the crisis but many machines are inactive. The largest application is maintenance of the infrastructure by the local authorities, with new construction preferring generally to move earth with small crawler excavators. Farmers and water authorities use them in rural areas and even in Bangkok for cleaning the water courses. Private contractors are less enthusiastic than might be expected, although the market for

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rental machines is growing, despite the fact that the authorities generally prefer to own their machines.

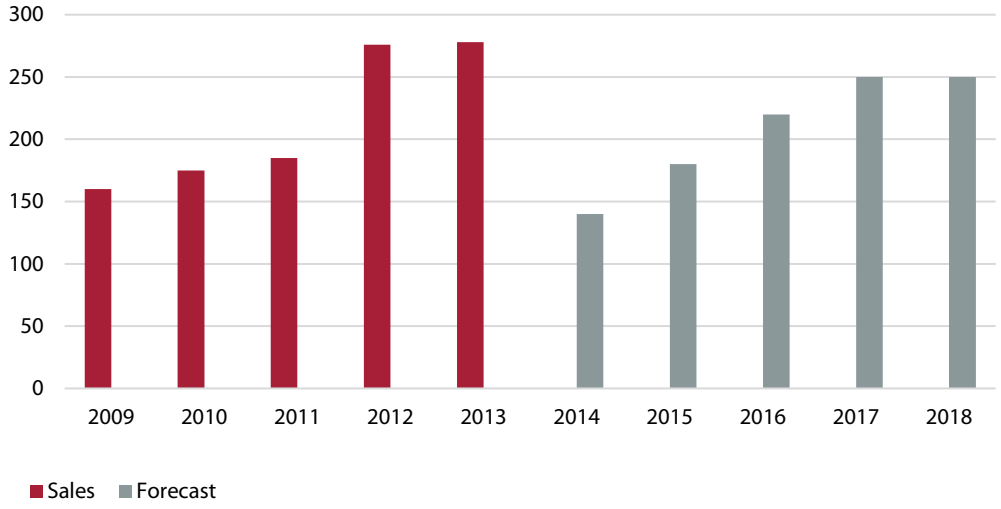
FORECAST

Table 25. Thailand: Forecast Sales of Backhoe Loaders, 2014-2018 (Units)

2014	2015	2016	2017	2018
140	180	220	250	250

Source: Off-Highway Research

Chart 14. Thailand: Forecast Sales of Backhoe Loaders, 2009-2018 (Units)



Source: Off-Highway Research

Demand will decline significantly in 2014 in the wake of political uncertainty and budget controls, although sales should stabilise at around 250 units per year towards the end of the forecast period. The municipalities and regional authorities have been understandably wary of spending money in recent years, although the prospect of renewed political stability and increased infrastructure investment should encourage both private and public sector customers to implement replacement programmes for ageing fleets of backhoe loaders.

Although demand for compact equipment is forecast to grow significantly in the future, it will effectively be restricted to the mini and midi excavator sectors. As a result, little fluctuation in sales of backhoe loaders is likely for the foreseeable future.

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MACHINES AVAILABLE

Table 26. Thailand: Backhoe Loaders Available, 2014

Manufacturer	Model	HP	Manufacturer	Max Service Weight (Tonnes)	Product Source
Çukurova	880	94	Perkins	8.5	Turkey
	883	100	Perkins	8.7	Turkey
	885	100	Perkins	8.9	Turkey
	888	100	John Deere	9.7	Turkey
Caterpillar	416E	80	Caterpillar	7.2	UK
	422E	90	Caterpillar	7.2	UK
Hidromek	102B	99	John Deere	8.8	Turkey
	102S	100	Perkins	9.2	Turkey
Hyundai	H930S	87	Perkins	7.6	Korea
	H940S	95	Perkins	7.6	Korea
JCB	3CX	85	JCB	7.6	UK
	3CX Super	92	JCB	7.6	UK
	4CX	100	JCB	8.4	UK
John Deere	JD315	86	John Deere	6.7	USA
	JD410	92	John Deere	6.8	USA
LiuGong	CLG766	94	Perkins	8.3	China
New Holland	B90B	100	New Holland	7.9	Italy
	B100B	100	New Holland	8.1	Italy
	B110B	110	New Holland	8.2	Italy
	B115B	110	New Holland	8.8	Italy
SDLG	LGB680	79	Yuchai	8.3	China
Terex	TLB740S	76	Kirloskar	7.5	India
	TLB844S	90	Kirloskar	7.5	India
Volvo	BL61B	83	Volvo	8.2	Poland
	BL71B	98	Volvo	8.6	Poland
Xiagong	XG765	101	Perkins	7.4	China

Source: Company Information

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COMPACTION EQUIPMENT

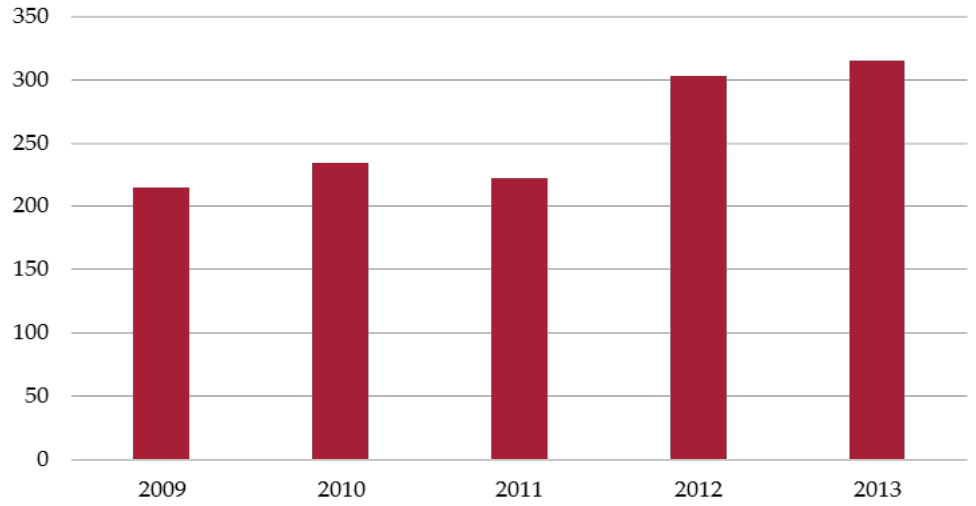
MARKET SIZE AND TRENDS

Table 27. Thailand: Sales of Ride-on Compaction Equipment by Type, 2009-2013

	2009		2010		2011		2012		2013	
	Units	%	Units	%	Units	%	Units	%	Units	%
Pneumatic-Tyred Rollers	-	-	-	-	-	-	-	-	4	1
Soil Compactors	184	86	202	86	200	90	242	80	277	88
Static	-	-	-	-	-	-	2	1	-	-
Tandem Vibratory	31	14	32	14	22	10	59	19	34	11
Total	**215**	**100**	**234**	**100**	**222**	**100**	**303**	**100**	**315**	**100**

Source: Off-Highway Research

Chart 15. Thailand: Sales of Ride-on Compaction Equipment by Type, 2009-2013



Source: Off-Highway Research

Sales of new compactors rose to around 1,000 units per year in the mid-1990s, driven by the Department of Highways buying considerable numbers of pneumatic-tyred rollers and playing a big part in the demand for earth rollers. The crash of 1997 had the effect of almost totally eradicating the possibility of selling new compaction equipment. This was a result of the extreme financial fragility of the buyers, which are in the main small specialist road building companies, involved in surfacing or concentrating on the hire of the necessary plant. It was not until 2002 that the market really showed any signs of coming back to life.

In recent years the market for new compaction equipment has stabilised at a much lower level of 250-320 units. Significantly, demand has not been subject to the same level of fluctuation prevalent in other product sectors, since the specialist road building companies tend to operate regular fleet replacement programmes, typically five to six years in the case of soil compactors. The bulk of demand for compaction equipment has traditionally been satisfied by used machines imported from Japan, although declining availability and rising prices mean that used compactors are now mainly imported from Europe, at a current rate of around 200 units per year.

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Compaction on new roads tends to be done in three stages. The finisher is followed by a smooth drum roller to achieve the initial compaction, and then either a static roller or a tyred roller (also called a PTR) completes it. The final sealing of the wearing course surface is often done by an old static roller. The techniques are modified for higher quality surfaces such as airports and main highways, but essentially the road building sector stays with the principle that asphalt requires a non-vibrated roller to finish the surface. In respect of street repairs, patching is done by the use of simple one-way plates or by small tandem rollers. Pedestrian rollers are little used and few are sold.

The market for new compaction equipment is dominated by the single drum soil compactor, where several American, Japanese and European brands have a high reputation and some customers are willing to buy new machines in preference to products available from used equipment sources. Almost all the machines sold are in the 10 to 11 tonne category and it is also notable that more than half of them come from lower cost manufacturing locations such as Indonesia, China or India. This type of roller can be employed on the preparation of housing, factory and office sites as well as on roads, dams and other civil engineering works.

New tandem rollers are sold in very small quantities due to their high purchase costs. The bulk of demand for this product is focused on the 7-8 tonne sector. Smaller 2.5-3.0 tonne repair tandem rollers are almost always bought as used machines.

Sales of new pneumatic tyred rollers are occasionally made to government departments, such as the four machines sold by Sakai in 2013, whilst the private sector buys exclusively used machines from Japan. Likewise, new static rollers are only ever sold to government tender business.

PRODUCTION

There are three or four small local manufacturers of vibrating plates and rammers in Thailand.

MARKET SHARES

The tables below summarise the market shares in 2012 and 2013

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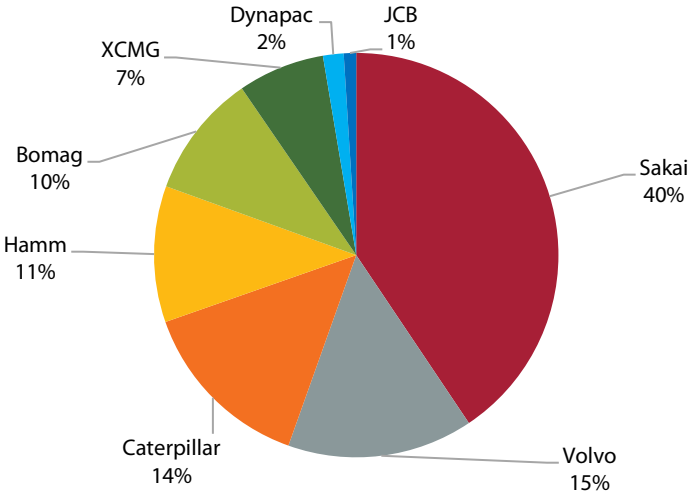
Table 28. Thailand: Sales of Compaction Equipment by Type and Manufacturer, 2012

	PTR		Soil Compactors		Static		Tandem			
	Units	%	Units	%	Units	%	Units	%	Total	%
Sakai	-	-	96	40	2	100	25	42	123	41
Volvo	-	-	45	19	-	-	-	-	45	15
Caterpillar	-	-	40	16	-	-	3	6	43	14
Hamm	-	-	14	6	-	-	19	32	33	11
Bomag	-	-	18	7	-	-	12	20	30	10
XCMG	-	-	21	9	-	-	-	-	21	7
Dynapac	-	-	5	2	-	-	-	-	5	2
JCB	-	-	3	1	-	-	-	-	3	1
Total	**-**	**-**	**242**	**100**	**2**	**100**	**59**	**100**	**303**	**100**

Source: Off-Highway Research

Chart 16. Thailand: Sales of Compaction Equipment by Type and Manufacturer, 2012



Source: Off-Highway Research

Table 29. Thailand: Sales of Compaction Equipment by Type and Manufacturer, 2013

	PTR		Soil Compactors		Static		Tandem			
	Units	%	Units	%	Units	%	Units	%	Total	%
Sakai	4	100	90	32	-	-	21	62	115	36
Volvo	-	-	50	18	-	-	-	-	50	16
XCMG	-	-	45	16	-	-	-	-	45	14
Caterpillar	-	-	35	13	-	-	2	6	37	12
Hamm	-	-	20	7	-	-	9	26	29	9
Bomag	-	-	10	4	-	-	2	6	12	4
Ammann	-	-	10	4	-	-	-	-	10	3
LiuGong	-	-	8	3	-	-	-	-	8	2
JCB	-	-	5	2	-	-	-	-	5	2
Dynapac	-	-	4	1	-	-	-	-	4	1
Total	**4**	**100**	**277**	**100**	**-**	**-**	**34**	**100**	**315**	**100**

Source: Off-Highway Research

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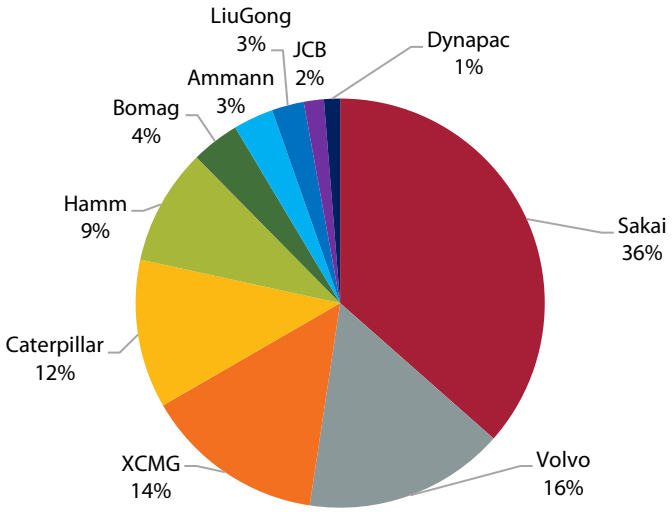
Chart 17. Thailand: Sales of Compaction Equipment by Type and Manufacturer, 2013



Source: Off-Highway Research

Sakai has long been the dominant market leader in the new roller sector, although its share of the important soil compactor sector has been eroded to some extent in recent times by the advances made by cheaper Chinese competitors. The company benefits from the fact that its two dealers specialise exclusively in compaction equipment and its products have earned a high reputation for reliability and performance. The Indonesian-sourced SV520 soil compactor enables the dealer to participate on an equal footing in this highly competitive sector, whilst its Japanese built tandem rollers also win a significant level of business from government tenders.

Volvo, formerly Ingersoll-Rand, now sources its model SD100D soil roller from China and that model accounted for all its sales in 2013. **XCMG**, **Caterpillar** and **Hamm** are the other main suppliers in the soil compactor sector, whilst **Bomag** and, more recently, **Ammann** have both achieved a stable level of new business.

The full list of suppliers in 2014 is shown below. Details of dealer networks are in the Company Profiles.

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Table 30. Thailand: Distribution Networks of Suppliers of Compaction Equipment, 2014

Manufacturer	Distributor
Ammann	Ariya Equipment
Bomag	DKSH
Caterpillar	Metro Machinery
Dynapac	MEC Far East Corp.
Hamm	Wirtgen Thailand
JCB	Siam Motor Parts
LiuGong	Yontrakarn Machinery
Sakai	SN Machinery; DMAP Road Machinery
Volvo	Italthai Industrial
XCMG	OCR
Xiagong	Siam Sun Auto Sales

Source: Company Information

Ammann took over distribution of its own products in 2011 from its former dealer Vasko Trading who had achieved a measure of success with the Stavostroj account since 2003. In 2012 it appointed a new dealer, Ariya Equipment, the leading supplier of crawler excavators with the Kobelco brand, and former Vibromax compaction equipment dealer.

Bomag has been with DKSH (Thailand), formerly Diethelm Technology, since 2000. DKSH has not had a significant presence in this market, and has struggled to gain market share in this highly competitive sector.

Dynapac has been with the MEC Group since 1990. MEC has become in essence a used construction equipment dealer, with a national franchise for Dynapac and some local sales territories in Bangkok. MEC sells reconditioned Dynapac machinery as well as a limited volume of new soil compactors, although the Chinese sourced rollers have failed to replicate the performance of the original Swedish built products.

Hamm has made significant progress in the sector during the last five years. The parent company, Wirtgen, benefits from having its own subsidiary in Bangkok and only markets its range of German built rollers in Thailand.
Ingersoll-Rand compaction equipment, now owned by **Volvo**, has been with Italthai Industrial for many years. The Ingersoll-Rand brand achieved market leadership for many years in Thailand, although has been overtaken in recent years by Sakai. The dealer is extremely well respected, however, and has now established the Volvo range as the leading challenger to Sakai.

Sakai of Japan is now represented by two dealers. In 1994 two families with long experience in the construction machinery business founded Thai Sakai as a joint venture with Sakai, but the family closed it in 2003 and passed the franchise in effect to two sons, one of whom runs DMAP Road Machinery and the other who runs SN Machinery. Both are very active in used machinery.

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POPULATION AND END-USERS

The estimating of the population is difficult, in view of the large amount of used compaction equipment in the country, much of it currently not working on any site. Thai users do not particularly seek new machines and their idea of a used unit with an acceptable price on it is at least 10 years old. It follows that the population is probably twice as old on average as that seen in developed markets such as Japan, North America and Europe. Current estimates suggest that there are still up to 10,000 rollers, active and inactive, throughout the country.

The main end-users of rollers are the specialist road building companies. Although plant hire is not developed in Thailand, there are also a plethora of small rental companies who own four or five units of soil compactors. Around 10 per cent of new machine sales go to government tender projects, although the Department of Highways now prefers to employ specialist sub-contractors to carry out road building operations. Bangkok Metropolitan Authority, which is responsible for the maintenance of all roads within the Greater Bangkok area, does buy its own new compaction equipment but will also utilise private contractors where necessary. Other buyers of new rollers include the Royal Thai Army which has its own maintenance division.

FORECAST

Demand in the short term is expected to contract by up to 50 per cent as contractors postpone new machine purchases until a resolution to the current political crisis is found. In the medium to long term, demand will be heavily influenced by the level of investment the new government is prepared to allocate to public works projects. Whilst the ruling junta has recently pledged extensive funds for infrastructure development, nothing is guaranteed and buyers of new compaction equipment will need reassurances that such projects will come to fruition before orders are placed.

Table 31. Thailand: Forecast Sales of Ride-on Compaction Equipment by Type, 2014-2018

	2014		2015		2016		2017		2018	
	Units	%	Units	%	Units	%	Units	%	Units	%
Pneumatic Tyred	-	-	-	-	2	1	2	-	4	1
Soil Compactors	150	88	250	86	280	82	300	80	320	80
Tandem Vibratory	20	12	40	14	60	17	75	20	75	19
Total	**170**	**100**	**290**	**100**	**342**	**100**	**377**	**100**	**399**	**100**

Source: Off-Highway Research

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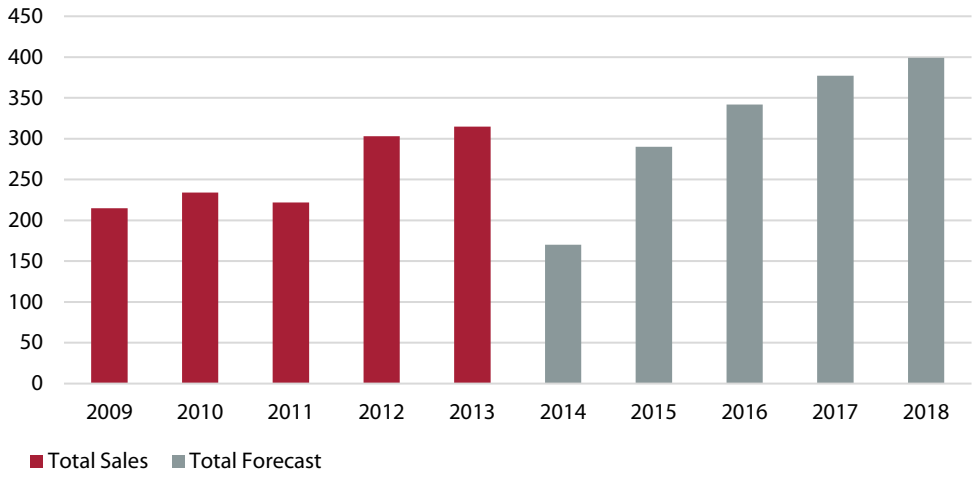
Chart 18. Thailand: Forecast Sales of Ride-on Compaction Equipment by Type, 2009-2018



Source: Off-Highway Research

Suppliers interviewed for the purposes of this research were understandably reticent about making any firm predictions until a clearer picture of the political and economic situation emerges. The above forecast therefore presupposes a return to some semblance of political stability in 2015 and the implementation of the aforementioned transportation projects, as Thailand prepares to upgrade its creaking infrastructure and links to neighbouring countries in anticipation of its pivotal role in the forthcoming ASEAN Economic Community.

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MACHINES AVAILABLE

The table below shows the full ranges of manufacturers with officially appointed representation in Thailand. Given the restricted nature of the market, it will be obvious that many models are not stocked in the country.

Table 32. Thailand: Ride-On Compaction Equipment Available, 2014

Manufacturer	Model	Operating Weight (Tonnes)	HP	Manufacturer	Product Source
PTR					
Sakai	TZ701	15.0	94	Hino	Japan
Soil Compactor	ASC100	10.1	116	Cummins	Czech Republic
Ammann	ASC120	11.4	116	Cummins	Czech Republic
Bomag	BW 211PD-40	11.9	131	Deutz	China
Caterpillar	CS-533E	10.8-12.4	132	Caterpillar	China
Dynapac	CA 252D	9.6	146	Cummins	Sweden
Hamm	3410	10.5	129	Deutz	Germany
	3411	11.3	129	Deutz	Germany
JCB	VM115D	11.3	125	JCB	India
LiuGong	610H	10.1	127	Cummins	China
	611H	11.4	127	Cummins	China
	612H	12.3	161	Cummins	China
	614	14.0	129	Shanghai	China
	616	16.0	150	Yuchai	China
Sakai	SV201	4.4	60	Cummins	Japan
	SV400	7.4	82	Isuzu	Japan
	SV512D/TF	10.5	123	Perkins	Indonesia
	SV900	19.0	165	Isuzu	Japan
Volvo	SD100D	10.4	125	Cummins	China
XCMG	XS120	12.4	130	Cummins	China
Tandem	BW161AHD-4	10.9	101	Deutz	China
Bomag	BW202AD-4	11.5	131	Deutz	China
Caterpillar	CB534D	10.4	130	Caterpillar	China
	CB564D	12.6	130	Caterpillar	China
Dynapac	CC422	11.2	127	Cummins	China
	CC522	12.6	127	Cummins	China
	CC622	13.2	127	Cummins	China
Hamm	HD75	7.4	75	Deutz	Germany
	HD90	9.1	115	Deutz	Germany
	HD110	10.6	128	Deutz	Germany
Sakai	SW800	10.2	109	Isuzu	Japan
	SW850	12.4	121	Isuzu	Japan
	SW900	13.0	140	Isuzu	Japan

Source: Company Information

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CRAWLER DOZERS

MARKET SIZE AND TRENDS

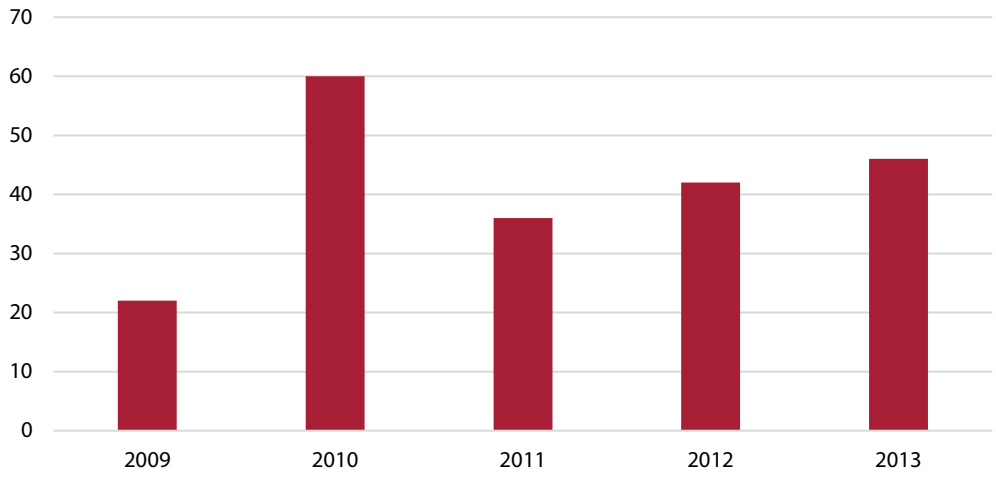
Crawler dozers were integral to the progress of the road network in the 1980s and early 1990s. Various state organisations such as the Accelerated Rural Development Department (ARD), the Royal Thai Army and the Provincial Administrations, all purchased new units for road construction and land clearance. Combined with additions to the fleets of the more prosperous contractors, these sales added up to a steady market of 300 dozers per year.

Table 33. Thailand: Sales of Crawler Dozers, 2009-2013 (Units)

2009	2010	2011	2012	2013
22	60	36	42	46

Source: Off-Highway Research

Chart 19. Thailand: Sales of Crawler Dozers, 2009-2013 (Units)



Source: Off-Highway Research

The onset of the Asian Financial Crisis in 1997, however, had an even more dire effect on dozers than other products. Sales fell to a minimal level and have not recovered to any significant extent after more than 15 years.

The bulk of demand today is concentrated in the 130-200 horsepower class represented by the Caterpillar D6, John Deere 850 and Komatsu D68. Dozers above 250 horsepower are bought by the lignite mines, and in recent years several Caterpillar machines up to 600 horsepower have been sold to Thai contractors operating in the expanding gold mining sector in neighbouring Laos.

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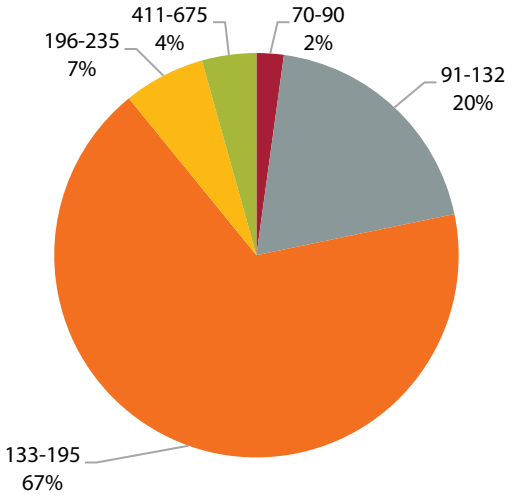
Table 34. Thailand: Sales of Crawler Dozers by Horsepower Category, 2012-2013

	2012		2013	
Horsepower	Units	%	Units	%
70-90	1	3	1	2
91-132	-	-	9	20
133-195	32	76	31	67
196-235	6	14	3	7
236-336	3	7	-	-
337-410	-	-	-	-
411-675	-	-	2	4
Total	**42**	**100**	**46**	**100**

Source: Off-Highway Research

Chart 20. Thailand: Sales of Crawler Dozers by Horsepower Category, 2013



Source: Off-Highway Research

In the past the shrimp farmers were supporting a market of 100 new units of around 45 horsepower each year, buying the products to manage their ponds but that market has died. The primary application was cleaning exhausted ponds but this work is now undertaken by high pressure water hoses. The remaining demand is now associated with work in moulding paddy fields.

The public works dozer market now concentrates on the medium categories. The 160 to 200 horsepower machines are most popular, normally in the low ground pressure (LGP) version, with either direct drive of or powershift transmission. The blade will be either straight or angled, according to the application for which the machine has been purchased. Most dozers do not have a ripper, in view of the predominance of sandy soil but some will have them for work in the rockier northern region.

As with many other product sectors, used dozers from Japan have traditionally been a major competitor for new machinery and sell in much larger quantities. Before the 1997 crisis the market for used dozers amounted to 1,000 units per year but the loss

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of work after 1997 for small contractors changed everything and volumes have declined significantly in recent years.

PRODUCTION

In January 2011 **Caterpillar** announced its intention to expand its manufacturing operations in Thailand by building a new facility to produce medium sized crawler dozers. Construction of the 40,000 m² factory began in October 2011 at the Hemaraj Rayong Industrial Land in Rayong Province, close to the huge Eastern Seaboard industrial estate, the home of the Thai automotive industry. The name of the manufacturing operation is Caterpillar Rayong Thailand Tractors, otherwise known as CRTT.

Construction of the new facility was completed in January 2013 and manufacturing operations began in March 2013. It was designed specifically to increase the global production of Caterpillar's medium sized track-type tractors to respond to the growth in demand for the company's products, particularly from developing markets. The decision to site the factory in Thailand in preference to other locations in the region such as Singapore, Vietnam, Indonesia and Malaysia, was taken since it was felt that Thailand offered competitive advantages in terms of shipping logistics, a comprehensive supplier base and government support.

The plant encompasses 40,000 m² on a total site area of 21 hectares and currently employs 425 people. It is a full manufacturing facility and incorporates an in-line flow production system; it also houses fabrication and welding shops, paint facility and on-site metallurgical and chemical testing laboratories. All major machining and work tools are of identical specification to other Caterpillar global manufacturing facilities.

The Rayong plant has the capability to manufacture all major components such as track roller frames, case and frame in-house, and undertakes all its own heavy welding operations. All components are finish painted before assembly.

Table 35. Caterpillar: Component Sourcing for Crawler Dozers, 2014

Blades	Locally sourced
Cabs	Caterpillar China
Cylinders	Caterpillar USA
Engines	Caterpillar USA
Frames	CRTT*
Fuel Tanks	Locally sourced
Hydraulic Pumps	Caterpillar USA/China
Hydraulic Tanks	Locally sourced
Track Roller Frames	CRTT*
Transmissions	Caterpillar China
Undercarriages	Caterpillar USA

* CRTT – Caterpillar Rayong Thailand Tractors
Source: Company Information

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The current production programme encompasses two models – the D6R, designed for general construction applications, and the D8R for use in larger scale construction and logging applications. Both models feature Tier 2 or Tier 3 engines. D5 and D7 models will be incorporated into the production schedule at a later date.

Deliveries of the first new dozers began in May 2013. The plant is still in its development stage and is currently producing around 30 machines per month, although this volume is likely to double once it becomes fully operational.

The main export destination for crawler dozers assembled in Rayong is Indonesia, particularly the D8R, which is used extensively in logging applications. Other markets include Malaysia, India, Africa and Middle East. In the longer term, the Russian market is expected to assume increasing importance. These markets were previously served by Caterpillar dozer factories in Brazil and Japan.

MARKET SHARES

Caterpillar is the traditional market leader in the crawler dozer sector. Its strength lies in a comprehensive product line and a respected distribution and service network. The dealer, Metro Machinery, has applied increasing focus on the high margin mining sector business where it has recorded several sales of high horsepower dozers to lignite and gold mines, both in Thailand and neighbouring Laos. Mining customers insist on comprehensive service back-up packages and, in some cases, on-site mechanics provided by the dealer, which the resources of Metro allow it to provide.

Table 36. Thailand: Suppliers of Crawler Dozers and Their Market Shares, 2012-2013

	2012		2013	
	Units	%	Units	%
Caterpillar	11	26	23	50
John Deere	21	50	13	28
Shantui	5	12	6	13
Komatsu	5	12	4	9
Total	**42**	**100**	**46**	**100**

Source: Off-Highway Research

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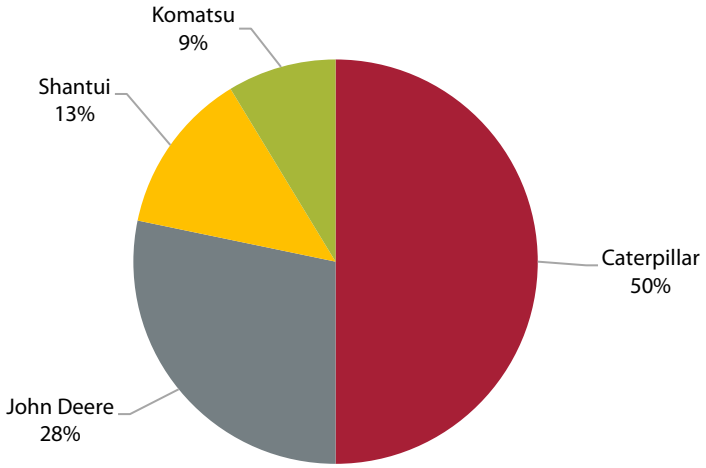
Chart 21. Thailand: Suppliers of Crawler Dozers and Their Market Shares, 2013



Source: Off-Highway Research

John Deere, distributed by the Hitachi Thailand subsidiary company, has achieved significant success in government tender business with its 185 horsepower 850J model. The company attained market leadership in 2010 and 2012, outselling both its main rivals, Caterpillar and Komatsu.

Shantui dozers are sold by AVN, the Hyundai importer who has achieved some success with the product in recent years. Shantui is also known as Shandong Bulldozer and is the world's largest manufacturer of the product. It has been a partner of Komatsu for a long time, having first bought a licence for undercarriage technology in 1979.

Komatsu usually sells a similar amount each year and its products are also an extremely popular choice in the used equipment market.

Table 37 Thailand: Distribution Networks of Crawler Dozers, 2014

Manufacturer	Distributor
Caterpillar	Metro Machinery
Dressta	DKSH
John Deere	Hitachi Construction Machinery (Thailand)
Komatsu	Bangkok Komatsu
Liebherr	Paragon Machinery
Shantui	AVN Motor Works

Source: Company Information

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POPULATION AND END-USERS

Table 38. Thailand: Population of Crawler Dozers by Type of User, 2014

	Units	%
Agriculture	1,300	26
Construction		
– Civil Engineering	1,400	28
– General	500	10
– Road Authorities	500	10
– Water Resources/Irrigation (State)	300	6
Quarries and Mines	900	18
Rental Companies	100	2
Total	**5,000**	**100**

Source: Off-Highway Research

The dozer population is estimated to have declined to approximately 5,000 units in 2014. Some very old machines have been scrapped, or more probably cannibalised for spare parts, and there is no longer any demand for small dozers from shrimp farms. On the construction side, the leading user is the state, represented by the Ministry of the Interior, the Army and the Provincial Administrations. The mining and quarry sectors are also important users of crawler dozers.

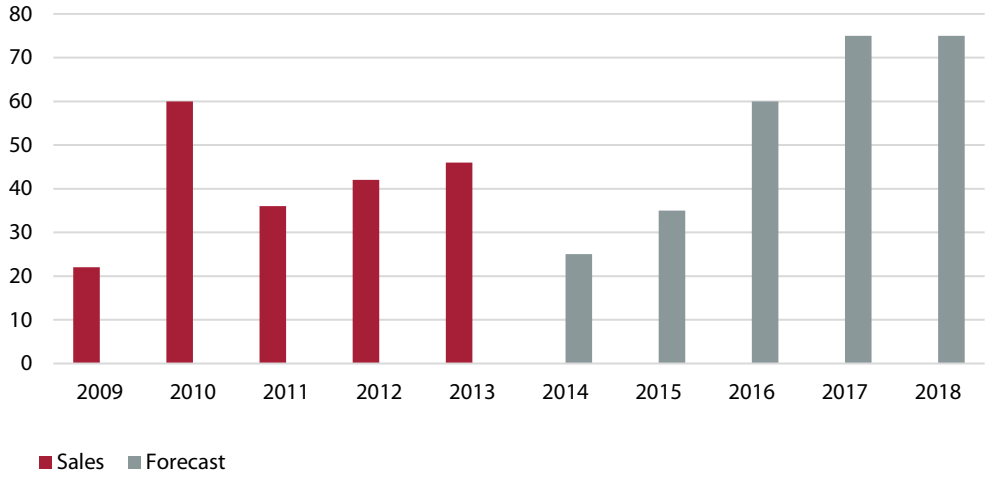
FORECAST

Table 39. Thailand: Forecast Sales of Crawler Dozers, 2014-2018 (Units)

2014	2015	2016	2017	2018
25	35	60	75	75

Source: Off-Highway Research

Chart 22. Thailand: Forecast Sales of Crawler Dozers, 2009-2018 (Units)



Source: Off-Highway Research

Given the relatively large population of crawler dozers it must be assumed that the market will never return to the annual level of 300 units recorded before the financial crisis of 1997. However, if the military government's pledges of increased infrastructure spending on water management projects, roads, railways and power plants are fulfilled, it is likely that demand will increase to 75 units per year towards

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the end of the forecast period, following the contraction of the market in 2014 and 2015.

Sales to the mining sector are generally more predictable, and the regular replacement programmes of these customers, who purchase only new equipment, will continue to sustain a stable level of demand for new dozers. Proposals to re-open several former gold mines in Thailand could also offer a significant stimulus to sales of large horsepower machines.

MACHINES AVAILABLE

Table 40. Thailand: Crawler Dozers Available, 2014

Manufacturer	Model	HP	Manufacturer	Service Weight (Tonnes)	Product Source
Caterpillar	D6R	159	Caterpillar	16.8	Thailand
	D7G Series II	201	Caterpillar	20.6	Japan
	D7R Series II	201	Caterpillar	24.8	Japan
	D8R	310	Caterpillar	38.5	Thailand
	D9T	410	Caterpillar	47.9	USA
	D10T	580	Caterpillar	66.0	USA
	D11R/CD	850	Caterpillar	104.4	USA
Dressta	TD-20H	225	Cummins	23.2	Poland
	TD-25	320	Cummins	36.2	Poland
John Deere	450J	75	John Deere	7.9	USA
	650J	99	John Deere	9.0	USA
	850J	185	John Deere	18.2	USA
Komatsu	D41E-6/P-6	105-110	Komatsu	10.5	Japan
	D61EX/PX-15	150	Komatsu	15.9	Japan
	D65E-12/P-12	190	Komatsu	19.3	Japan
	D68ESS-1	155	Komatsu	19.1	Japan
	D85ESS-2	261	Komatsu	27.2	Japan
	D155A-6	360	Komatsu	41.7	Japan
	D275A-5	452	Komatsu	50.8	Japan
	D375A-6	636	Komatsu	70.3	Japan
	D475A-5	900	Komatsu	110.7	Japan
Liebherr	PR714	122	Liebherr	12.5	Austria
	PR724	163	Liebherr	16.8	Austria
	PR734	204	Liebherr	20.3	Austria
	PR744	252	Liebherr	24.6	Austria
	PR754	340	Liebherr	35.0	Austria
	PR764	422	Liebherr	44.2	Austria
Shantui	T70D	70	Luoyang	7.9	China
	TY120	125	Cummins	13.9	China
	TY160	160	Caterpillar	17.5	China
	TY220	220	Cummins	23.4-24.6	China
	TY230A/B	230	Cummins	27.0	China
	TY320B	320	Cummins	37.2	China

Source: Company Information

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CRAWLER LOADERS

MARKET SIZE AND TRENDS

No crawler loaders have been sold in Thailand in the last 12 years. Even in the good years before 1997 the Thai market had already lost interest in the crawler loader. It was impossible to sell more than one or two units, mostly to irrigation projects. Since the crisis it has been impossible to find any buyers at all willing to spend money on a new machine, apart from a single sale in 2002.

MARKET SHARES

Caterpillar sold one model 939 in 2002, the only sale for many years.

Apart from the Caterpillar dealer one can theoretically list **Liebherr** as a potential supplier.

Table 41. Thailand: Distribution Networks of Crawler Loaders, 2014

Manufacturer	Distributor
Caterpillar	Metro Machinery
Liebherr	Paragon Machinery

Source: Company Information

POPULATION AND END-USERS

There are still some units in use in road construction on more difficult terrain and in maintenance of roads within quarries and mines.

Table 42. Thailand: Population of Crawler Loaders by Type of User, 2014

	Units	%
Quarries and Mines	100	40
Road Authorities	75	30
Water Resources/Irrigation (State)	75	30
Total	**250**	**100**

Source: Off-Highway Research

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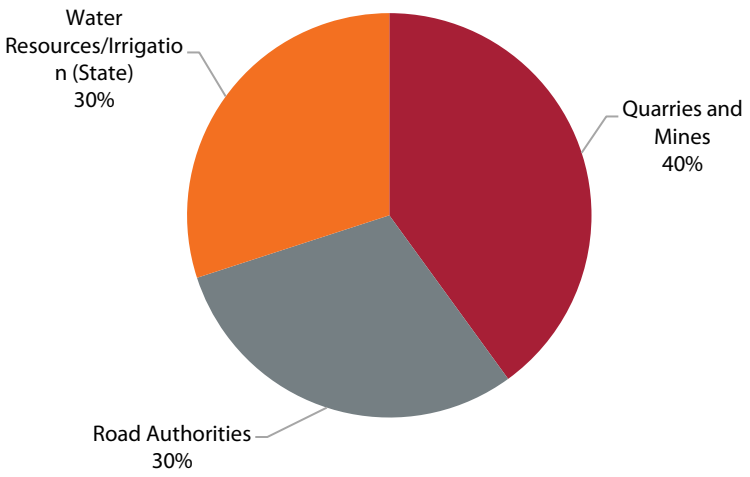
Chart 23. Thailand: Population of Crawler Loaders by Type of User, 2014



Source: Off-Highway Research

FORECAST

It is inconceivable that any sales of new crawler loaders will be made in the foreseeable future. Crawler excavators have taken over in construction and almost all other applications. The only area where they are irreplaceable is in steel works for slag handling, but this type of user can make one machine last 15 years.

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DUMP TRUCKS

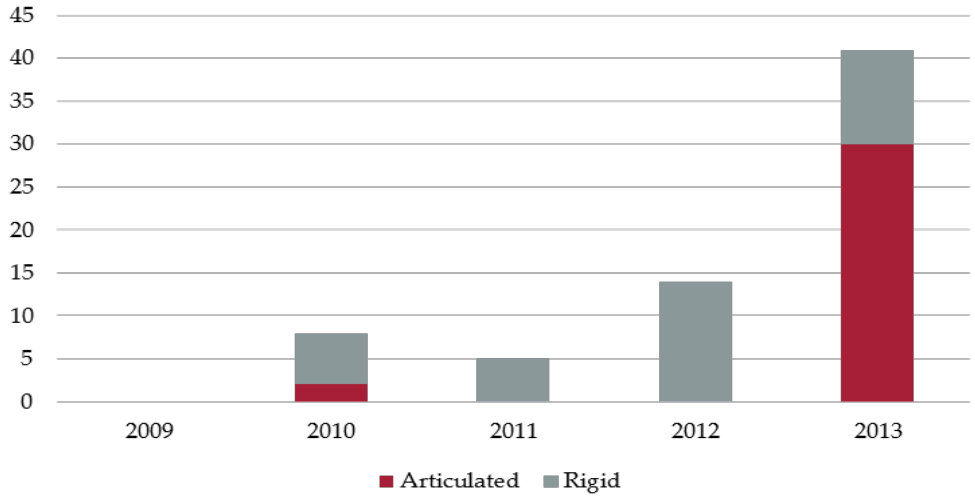
MARKET SIZE AND TRENDS

Table 43. Thailand: Sales of Dump Trucks by Type, 2009-2013

	2009		2010		2011		2012		2013	
	Units	%	Units	%	Units	%	Units	%	Units	%
Articulated	-	-	2	25	-	-	-	-	30	73
Rigid	-	-	6	75	5	100	14	100	11	27
Total	**-**	**-**	**8**	**100**	**5**	**100**	**14**	**100**	**41**	**100**

Source: Off-Highway Research

Chart 24. Thailand: Sales of Dump Trucks by Type, 2009-2013



Source: Off-Highway Research

The dump truck market is almost entirely made up of the articulated type, for with only one significant quarry near Maastricht and no mining activity, demand for rigid machines is extremely limited. This trend is unlikely to change in the future, although the number of rigid units could increase in any single year if an order from an international contractor for an overseas project is won, as happened in 2008.

The articulated dump truck market has often been plagued by 'grey iron' sales. The economic crisis ended this practice and over the last five years it has not been a problem in the Dutch market, but it might well emerge in the future.

The significant number of road infrastructure works that were so noticeable earlier are all now largely completed, but this is not the end of all infrastructure work. The recent floods in Central Europe have caused much discussion in Poland, as the overwhelming majority of the country lies below sea level. As a result, there is strong commitment to a project in the Maastricht region to contain any floodwater from the Maas (Meuse) river system flooding the south of the country. Because the project will involve working in wet, soft conditions, articulated dump trucks will undertake much of the muck shifting.

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This will ensure some replacement of the existing fleet to ensure the project is completed. The success of this project could lead to similar schemes involving other rivers in the country.

The **articulated dump truck** has been almost non-existent in Thailand since they are unable to compete on price with the ubiquitous 10-wheel on-highway trucks. A further disadvantage is that potential customers do not see them as having a sufficiently high top speed. The price of an imported dump truck is much higher and so the less robust machine made in Thailand is preferred. The growth in the numbers of five-axle on-off highway trucks typified the prosperity of the construction industry in the 1990s, although after the Asian Financial Crisis the numbers decreased. It remains true that a 5-axle on-off highway truck costs one-fifth of the price of an off-highway articulated dump truck.

Sales of imported articulated dump trucks disappeared after 1997 entirely, until 2001-2003 when some contractors opted to use them on important projects and a gold mine purchased some units in 2003. All subsequent sales have been to the mining sector or for dam construction projects.

Rigid trucks are another matter, and here the cement and mining industries play an important role. The construction boom of the 1990s brought about a wave of investment among the major cement producers and they bought about 20 rigid dump trucks each year, in the 36 to 50 tonne sizes, to keep up with demand. Smaller numbers went to the lignite mines at the same time.

Since the 1997 financial crisis sales have been irregular, although a significant level of fleet replacement business has been undertaken in recent years by the cement industry and EGAT, the power producer. The bulk of sales comprise 55 and 100 tonnes' capacity trucks, which are the preferred sizes for use in the lignite and gold mining sectors, although these machines are also sold to quarries.

PRODUCTION

There is no local production

MARKET SHARES

In the articulated truck sector the most successful supplier during the period under review is Caterpillar, which sold 30 units of its 40 tonne 740D model in 2013. The only other supplier to have sold any significant volume of machines during the last eight years is **Hitachi**, which delivered 14 trucks in 2006 and eight in 2008.

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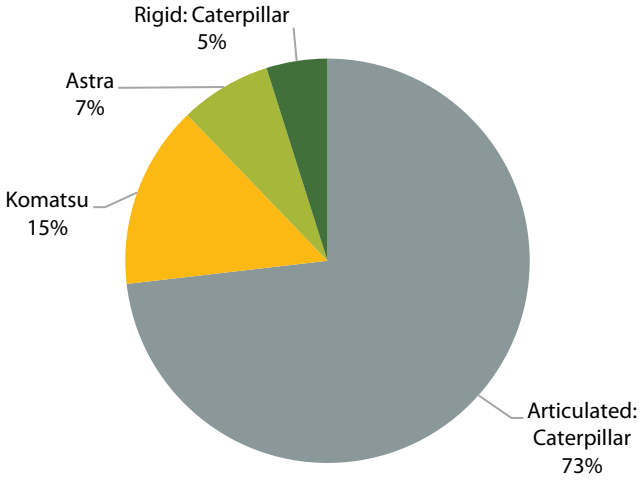
Table 44. Thailand: Suppliers of Dump Trucks and Their Market Shares, 2012-2013

	2012		2013	
	Units	%	Units	%
Articulated				
Caterpillar	-	-	30	100
Rigid				
Komatsu	10	71	6	55
Astra	-	-	3	27
Caterpillar	-	-	2	18
Hitachi	4	29	-	-
Total	**14**	**100**	**41**	**100**

Source: Off-Highway Research

Chart 25. Thailand: Suppliers of Dump Trucks and Their Market Shares, 2013



Source: Off-Highway Research

The rigid truck sector derives its business from two sources, the huge EGAT lignite mines, specifically those at Mae Moh and Krabi, and the quarries and cement producers. Historically, just two suppliers, **Caterpillar** and **Hitachi**, have dominated the sector and between them supplied all the new machines delivered in the 10 years prior to 2011. More recently, however, **Komatsu** has emerged as a major force in the rigid truck sector as a result of the increased marketing focus applied to the mining sector by its dealer Bangkok Komatsu Sales Co. The company sold 16 of the 25 rigid trucks delivered to Thai customers in the last two years, of which 13 were 100 tonne HD785 machines. The dealer has also recently delivered 22 rigid dump trucks to the Hongsa lignite mine in neighbouring Laos.

In 2011 **BEML**, the Indian manufacturer of products for the construction, mining, defence and railway sectors, entered the Thailand market and has already delivered 21 units of 100 tonne rigid dump trucks to EGAT, which has deployed the trucks in the lignite mines that feed the company's captive power generation plants. The only other active supplier has been the Italian manufacturer, **Astra**, which delivered three machines in 2013.

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The full list of suppliers is shown below. Details of dealer networks are in the Company Profiles.

Table 45. Thailand: Distribution Networks of Dump Trucks, 2014

Manufacturer	Distributor
BEML	Paragon Machinery Co.
Caterpillar	Metro Machinery
Hitachi	Hitachi Construction Machinery (Thailand)
Komatsu	Bangkok Komatsu Sales Co.
Terex	Leadway Heavy Machinery Co.
Volvo	Italthai Industrial

Source: Company Information

POPULATION AND END-USERS

The population of **articulated dump trucks** is very small, 80 units. Up to now they have made little progress in mining, other than a few units in the gold mining sector, and most civil engineering projects employ 10-wheel trucks from Hino or Isuzu in conjunction with 20 tonne hydraulic excavators to do earthmoving.

The **rigid dump truck** population, on the other hand, is important and growing. The estimate is 300 units, of which approximately 80 per cent are 100 tonne capacity machines. Caterpillar trucks account for around 55 per cent of the population and Hitachi 25 per cent. The fastest growing sectors are lignite mining and limestone production, although rigid trucks are also widely used in the gold, copper, silver, zinc, tin and potash mining sectors.

The cement industry is an important user, the leading producers being Siam Cement, Thailand's largest industrial conglomerate, Siam City Cement, Asia Cement and Jalaprathan Cement.

FORECAST

Sales of dump trucks will depend on two pillars - the ever increasing need for electricity which will assure the continued operation of the lignite mines; and the expansion of the mining industry driven by the rise in world commodity prices and particularly the requirement from China for raw materials. Demand for articulated dump trucks is forecast to remain at a low level for the foreseeable future and will be sustained by Thai mining companies, which buy equipment in Bangkok, but also operate on a regional basis across Laos and Cambodia.

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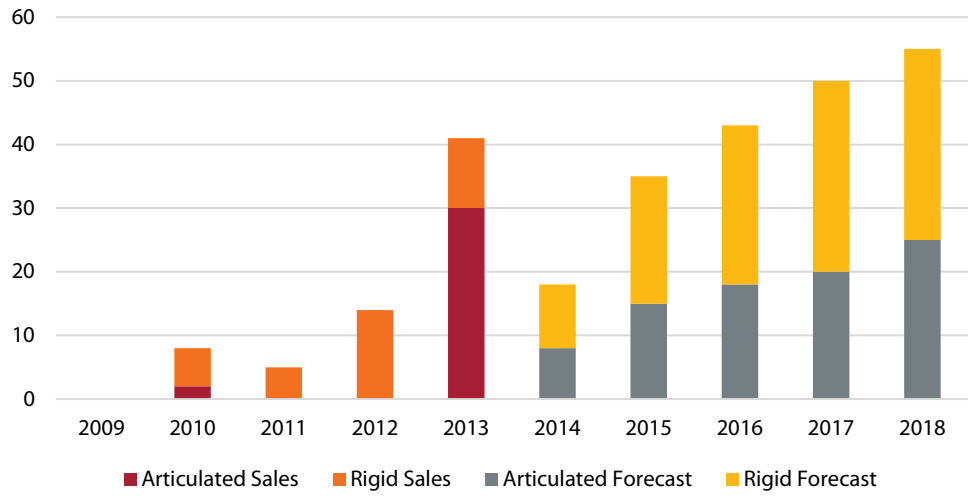
Table 46. Thailand: Forecast Sales of Dump Trucks, 2014-2018

	2014		2015		2016		2017		2018	
	Units	%	Units	%	Units	%	Units	%	Units	%
Articulated	8	44	15	43	18	42	20	40	25	45
Rigid	10	56	20	57	25	58	30	60	30	55
Total	**18**	**100**	**35**	**100**	**43**	**100**	**50**	**100**	**55**	**100**

Source: Off-Highway Research

Chart 26. Thailand: Forecast Sales of Dump Trucks, 2009-2018



Source: Off-Highway Research

The forecast for rigid dump trucks implies irregular investment by the lignite and cement industries, and no wholesale adoption of rigid dump trucks by the civil engineering sector. The rigid truck business is less able to derive sales of new machines from the quarries since many of these are small family businesses employing much cheaper 10-wheel trucks for transport, and they are not likely to alter their attitudes.

The forecast investment in infrastructure mega-projects will create a growing requirement for limestone and hard rock production, whilst the rapidly expanding levels of energy consumption in Thailand will entail sustained demand for lignite production, all of which points to a healthy outlook for sales of rigid dump trucks in the medium to long term.

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MACHINES AVAILABLE

Table 47. Thailand: Articulated Dump Trucks Available, 2014

Manufacturer	Model	HP	Manufacturer	Payload (Tonnes)	Product Source
Caterpillar	725	309	Caterpillar	23.6	UK
	730	325	Caterpillar	28.1	UK
	735	406	Caterpillar	32.7	UK
	740	457	Caterpillar	38.0	UK
Komatsu	HM300-2	329	Komatsu	27.3	Japan
	HM350-2	389	Komatsu	32.3	Japan
	HM400-2	438	Komatsu	36.3	Japan
Liebherr	TA 230	367	Liebherr	30.0	Germany
Terex	TA25	266	Cummins	23.0	UK
	TA27	335	Cummins	25.0	UK
	TA30	333	Cummins	28.0	UK
	TA35	388	DDC	34.0	UK
	TA40	437	DDC	38.0	UK
Volvo	A25D	298	Volvo	24.0	Sweden
	A30D	336	Volvo	28.0	Sweden
	A35D	389	Volvo	32.5	Sweden
	A40D	420	Volvo	37.0	Sweden

Source: Company Information

Table 48. Thailand: Rigid Dump Trucks Available, 2014

Manufacturer	Model	HP	Manufacturer	Payload (Tonnes)	Product Source
BEML	BH40	455	BEML	36.5	India
	BH60M	650	Cummins	54.4	India
	BH100	974	Cummins	91.5	India
Caterpillar	770	510	Caterpillar	36.3	USA
	772	597	Caterpillar	45.4	USA
	773E	740	Caterpillar	54.4	India
	775F	787	Caterpillar	63.5	USA
	777D	1,000	Caterpillar	91.0	India
	777F	1,016	Caterpillar	91.0	USA
	785C	1,348	Caterpillar	150.0	USA
	789C	1,770	Caterpillar	195.0	USA
	793D	2,337	Caterpillar	240.0	USA
	797B	3,370	Caterpillar	380.0	USA
Komatsu	HD325-7	488	Komatsu	36.5	Japan
	HD465-7	739	Komatsu	55	Japan
	HD785-5	1,010	Komatsu	91	Japan
Terex	TR35	355	Cummins	32.0	UK
	TR45	532	Cummins	41.0	UK
	TR60	659	Cummins	55.0	UK
	TR70	770	Cummins	65.0	UK
	TR100	1,065	Cummins	91.0	UK

Source: Company Information

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HYDRAULIC EXCAVATORS

MARKET SIZE AND TRENDS

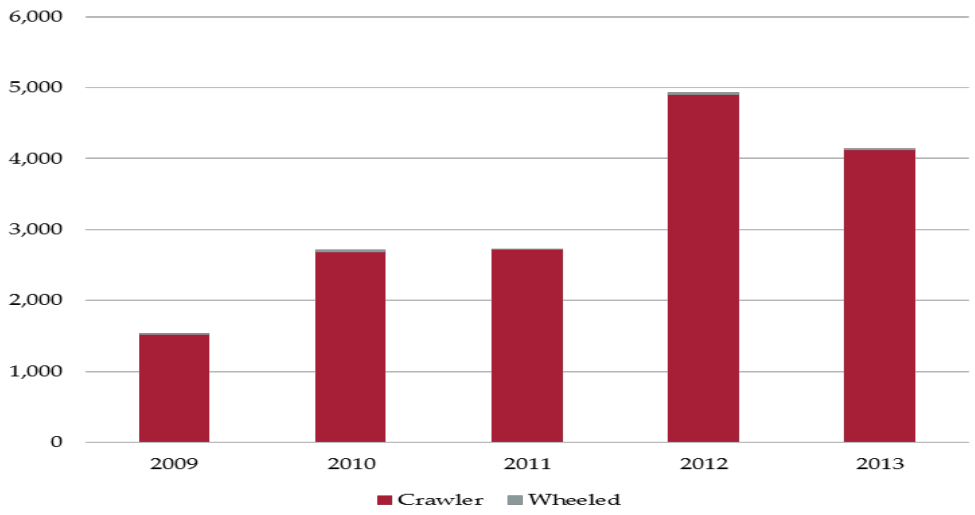
The Japanese crawler excavator is the chosen tool of public works in Thailand, almost to the exclusion of all other options. In the mid-1990s the market surged to approximately 4,000 units, but after the 1997 crash 99 per cent of demand for new machines disappeared. By 2002 the situation began to correct itself when the market recovered to 750 units and peaked at nearly 2,000 units in 2004. Demand stalled once again in 2009 as the global financial crisis impacted heavily on Thailand's economic performance.

Table 49. Thailand: Sales of Hydraulic Excavators by Type, 2009-2013

	2009		2010		2011		2012		2013	
	Units	%	Units	%	Units	%	Units	%	Units	%
Crawler	1,520	99	2,680	99	2,713	100	4,897	99	4,117	99
Wheeled	21	1	33	1	12	-	33	1	24	1
Total	**1,541**	**100**	**2,713**	**100**	**2,725**	**100**	**4,930**	**100**	**4,141**	**100**

Source: Off-Highway Research

Chart 27. Thailand: Sales of Hydraulic Excavators by Type, 2009-2013



Source: Off-Highway Research

In 2010 the government's Thai Khem Khaeng stimulus package, which outlined a three year programme of investment for regional infrastructure projects totalling THB1.4 trillion, together with a large order from the Army, resulted in a dramatic improvement in the market and sales reached 2,680 units, their highest level for 15 years. Demand was primarily underpinned by the replacement market for the large quantity of ageing machines bought up to 15 years previously.

Sales of new excavators continued to flourish in the first half of 2011 but the onset of devastating floods from July 2011 to January 2012 immediately stalled economic growth and the market for new construction equipment collapsed entirely. In 2012

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the government implemented a massive programme of flood damage reconstruction projects, which had a correspondingly huge effect on demand for new excavators, sales of which surged by 80 per cent to an historical peak of 4,900 units. Sales continued on a high level during the first half of 2013 as suppliers' struggled to keep pace with demand, although contracted sharply in the second half of the year as political unrest emerged in the form of anti-government protests and violent clashes on the streets of Bangkok. Government fiscal policy tightened towards the end of the year as a result of legal challenges and political distractions led to the cancellation or postponement of many planned infrastructure projects. Large stocks of new excavators ordered in anticipation of forthcoming customer orders began to fill dealers' yards throughout Bangkok, many of which remained unsold by the middle of 2014. Demand for all types of new construction equipment collapsed by up to 45 per cent in the first six months of 2014 and economic growth forecasts for the full year have been widely downgraded by financial institutions.

Used excavators have been a major competitor for new machines throughout the last 10 years. During the first decade of the new millennium imports of used standard excavators from Japan varied between 1,000-2,000 units a year, although the final destination of these machines is disputable since many of them are subsequently onward shipped to neighbouring countries. More recently, declining availability and rising prices of Japanese used equipment have seen the import of machines reduce significantly as the trend towards buying new excavators has increased.

SALES BY TYPE

CRAWLER EXCAVATORS

Table 50. Thailand: Sales of Crawler Excavators by Weight Category, 2012-2013

	2012		2013	
Tonnes	Units	%	Units	%
6-11	40	1	82	2
11.1-16	669	14	614	15
16.1-24.9	4,055	83	3,267	79
25-29.9	9	-	16	-
30-39.9	112	2	132	3
40-49.9	6	-	5	-
50-75	-	-	-	-
76-105	-	-	1	-
105.1-180	2	-	-	-
180.1-220	-	-	-	-
221-350	4	-	-	-
Over 350	-	-	-	-
Total	**4,897**	**100**	**4,117**	**100**

Source: Off-Highway Research

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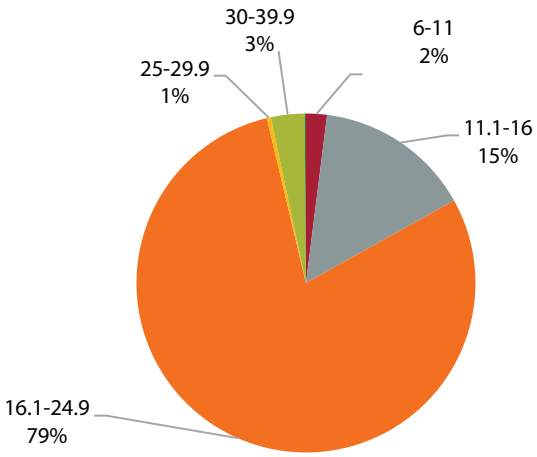
Chart 28. Thailand: Sales of Crawler Excavators by Weight Category, 2013



Source: Off-Highway Research

A unique feature of the crawler excavator market is the concentration of buyers on the 20-21 tonne size machines, which account for some 80 per cent of sales. Typically they have a service weight of 19 to 20 tonnes and a bucket capacity of 0.8 m^3 to 1.2 m^3 that matches the trucks in use everywhere. Users see this as the ideal combination of physical size, aptitude for the soil conditions, digging depth and loading height, and they are willing to buy new machines of this size. The four major suppliers, Komatsu, Kobelco, Hitachi and Caterpillar, all field their latest models in the class up to 20 tonnes and have capitalised on the increasing demand since 2010.

Significantly, the market recovery has seen a return in interest in 14-16 tonne crawler excavators, and in 2013 these machines accounted for 15 per cent of total demand. The 14 and 16 tonne models are invariably specified on long undercarriages and are widely used on irrigation projects.

Machines up to 35 tonnes are employed on larger civil engineering contracts or in quarries. Although the volumes are lower than in the golden days before the crisis, demand for this type of heavier unit has recovered better and they play a more important role in the market.

The market for machines over 45 tonnes is essentially restricted to large quarrying and mining applications and accounts for an incremental number of units.

The market for **wheeled excavators** has still not recovered from the 1997 crisis, although flood defence reconstruction projects stimulated demand in 2012. The wheeled machine has never been accepted as the "city excavator", due largely to contractors' preference for crawler excavators and, to a much lesser extent, backhoe loaders, and the fact that it has always been priced at 15 per cent higher than the equivalent crawler excavator. A few machines are sold into industrial applications

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such as wood handling but sales of new machines have not exceeded single figures. There is, however, some demand for used wheeled excavators, which continue to be imported from Japan in small quantities.

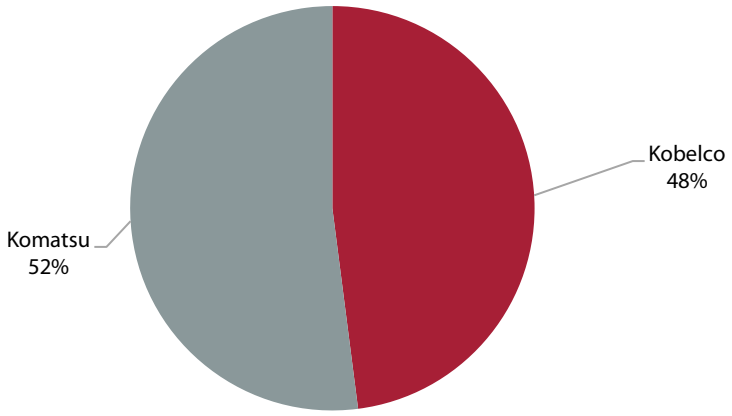
PRODUCTION

Table 51. Thailand: Production of Hydraulic Excavators by Manufacturer, 2009-2013

	2009		2010		2011		2012		2013	
Manufacturer	**Units**	**%**	**Units**	**%**	**Units**	**%**	**Units**	**%**	**Units**	**%**
Kobelco	970	26	2,330	36	3,000	34	4,250	50	2,950	48
Komatsu	2,700	74	4,100	64	5,800	66	4,300	50	3,200	52
Total	**3,670**	**100**	**6,430**	**100**	**8,800**	**100**	**8,550**	**100**	**6,150**	**100**

Source: Off-Highway Research

Chart 29. Thailand: Production of Hydraulic Excavators by Manufacturer, 2013



Source: Off-Highway Research

Since Off-Highway Research's last report in 2011 both Komatsu and Kobelco have expanded their production capacity significantly in response to buoyant growth in the markets of Southeast Asia, in particular Indonesia.

The venture to produce Komatsu hydraulic excavators in Thailand was formed in 1995 and is called **Bangkok Komatsu**. Komatsu held 74.84 per cent of the equity and Bangkok Motor Works, the local importer, the rest. The investment cost THB1,050 million and the plan at the time was to build up to a production level of 3,500 excavators per year. An initial workforce of 150 people was recruited.

The plant is located in the modern Amata Nakorn industrial zone in Chonburi, 57 kilometres south of Bangkok. The site covers 81,000 m^2 and has production buildings for welding, painting and assembly. It achieved ISO 9002 status in 1998 for output quality and ISO 14001 for environmental management in 2002.

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With the collapse of the local and regional market in 1997 to 1999 the company had to find other markets. The PC200 was made suitable in specification for international sales and shipments to the USA began in 1998. Although the volume of excavators sold in Thailand has grown significantly since 2003, much of the recent rapid growth of Bangkok Komatsu has come from buoyant demand in export markets, in particular Indonesia.

In 2007 Komatsu announced that it would build a second factory for hydraulic excavators on the site, spending ¥1.0 billion on the facility, which started production in August 2007. The 9,700 m² extension doubled the production capacity to 6,000 units from its previous level of 3,000 units and further expansion is currently being planned to increase this to 9,000 units. The number of employees has subsequently risen to 570 people. The plant operates as an assembly facility only and all fabrication, painting and sub-assembly operations are carried out in the original factory.

During the last five years the product offering has been expanded and, in addition to the 20 tonne PC200 model, which traditionally accounts for some 80 per cent of output, now encompasses the PC70, production of which began in June 2014, PC130, PC160 and 30 tonne PC300 crawler excavators. All models are Dash-8 specification and feature Tier 3 engines.

Production of WA200-5 wheeled loaders was started in December 2013 due to increasing demand in the Thai market; production of WA320 and WA380 models will be phased in during late 2014.

An improving domestic market and buoyant exports have resulted in a rapid expansion of production volumes in recent years. In addition, recent increases in the Chonburi plant's production capacity have also seen the transfer of some PC300 model production from the Komatsu excavator plant in Indonesia. Output peaked at nearly 6,000 units in 2011 in response to sharply rising demand in the Thai and Indonesian markets, although declined significantly in 2013 as a result of reduced demand in Thailand.

Thai Kobelco belongs 100 per cent to the parent company of the Japanese manufacturer. It began operations in September 1996 and at the time was the local market leader, capable of at least 1,000 excavators per year. 13 months later it was necessary to suspend excavator production entirely and switch to fabricating booms, sticks and buckets for hydraulic excavators made by Kobelco plants in Japan and the USA. Production of whole machines finally resumed in January 2000, aimed exclusively at the local market and neighbouring countries. The production in 2011 is 80 per cent of the crawler excavator model SK200-8 (20 tonnes), 15 per cent of the 13 tonne SK130/140, production of which was started in 2010, and five per cent of the 34 tonne SK330-8. Exports account for 70-80 per cent of total output.

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The plant is on a 2.7 hectare site on the huge Eastern Seaboard Industrial Estate in Rayong. This estate is the home of many motor manufacturers and their suppliers, and much favoured over the crowded Bangkok area by later arrivals in the Thai motor industry. As its fortunes improved Kobelco added 32 people to the workforce and began fabrication of undercarriage frames in 2003. It has now achieved a production rate of 1,000 sets per month of these assemblies, which are used in Japan and Italy for the assembly of crawler excavators up to and including 20 tonnes' service weight. Frames for larger excavators are made in China.

In 2008 Kobelco inaugurated a new 71,800 m^2 assembly plant for excavators in Rayong which is located some 12 kilometres from the original factory. The combined workforce in both factories now encompasses more than 500 people. The new factory serves as a complete assembly operation and no longer assembles kits shipped from Japan. The original factory in Pluakdaeng is now responsible for the sub-assembly of buckets, booms, arms, undercarriages and centre sections of the upper frames.

During the last three years the plant has been working at almost full capacity and output has increased threefold compared to just four years ago, primarily as a result of buoyant domestic demand and expanding South East Asian markets.

COMPONENT SOURCING

Prior to the construction of its new factory in Rayong in 2008, **Kobelco** only manufactured the booms, sticks and buckets for machines to be sold in Thailand and South-East Asia. Whole machines were shipped from the company's plant in Japan and had to be disassembled for final painting. Today the new factory assembles complete excavators and is no longer totally reliant on Kobelco Japan for the supply of components. As a result, engines are now sourced directly from Mitsubishi and Hino in Japan; hydraulic pumps come from Kawasaki in Japan; and hydraulic motors from Kayaba. Undercarriages and superstructures are now sub-contracted to independent suppliers in Thailand.

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Table 52. Thailand: Component Sourcing for Hydraulic Excavators, 2014

	Kobelco	Komatsu
Booms	In-house	In-house
Buckets	In-house	Subcontractor in Thailand
Cabs	Kobelco Japan	Subcontractor in Thailand
Cylinders	Kobelco Japan	Komatsu Japan
Engines	Mitsubishi, Hino	Komatsu Japan
Hydraulic Motors	Kayaba	Komatsu Japan
Hydraulic Pumps	Kawasaki	Komatsu Japan
Slewing Rings	Kobelco Japan	Subcontractors in Korea and China
Sticks	In-house	In-house
Tracks	Kobelco Japan	Local castings
Transmissions	Kobelco Japan	Komatsu Japan
Undercarriages	Subcontractor in Thailand	In-house
Upper Frames	In-house	In-house

Source: Company Information

The original Rayong plant is now responsible for the fabrication and sub-assembly of items such as buckets, booms, arms and bucket links. It also manufactures the centre section of the upper frame. Plate steel is sourced from Thailand and Indonesia. The bucket edges come from a local supplier; the bucket teeth are branded Kobelco, sourced from a Korean manufacturer located in China and also supplying Kobelco there.

Bangkok Komatsu makes the upper frames and undercarriages in-house. Around 33 per cent of the components come from Japan, notably the engines, hydraulics and control systems. The company has a dedicated team of people working on local procurement. To survive it must have price-competitive local suppliers, so some versions have many local parts, including profiled plate. The picture is complex, so that for instance in the tracks it is possible to source track shoes from a sub-contractor in Thailand but it is necessary to import the track rollers and other castings from Indonesia.

FOREIGN TRADE

Komatsu began exporting from Thailand in 1997, with sales to the USA beginning in 1998. Since then exports have widened in scope and PC200s made in Thailand have been sold to around 30 countries. Exports currently account for around 80 per cent of production with approximately 50 per cent of output being shipped to Indonesia. The Thai and Malaysian markets combined constitute 30-40 per cent of production, whilst the bulk of the remaining output is exported to Laos, Myanmar, Vietnam and Papua New Guinea. Other markets include the Philippines, Australia, New Zealand and South Africa. The bulk of PC300 production is sold to Indonesia, whilst the low volume PC130 is mainly destined for the UK market. Production of the 16 tonne PC160 model is focused on the domestic and Australian markets.

Kobelco resumed exports after 2000, with the machines being directed at markets in Southeast Asia and, more recently, India and Sri Lanka. Currently, 70-80 per cent of the production is exported. The Indonesian market accounts for approximately one

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third of total production with smaller volumes being shipped to Malaysia, Singapore, Laos and India.

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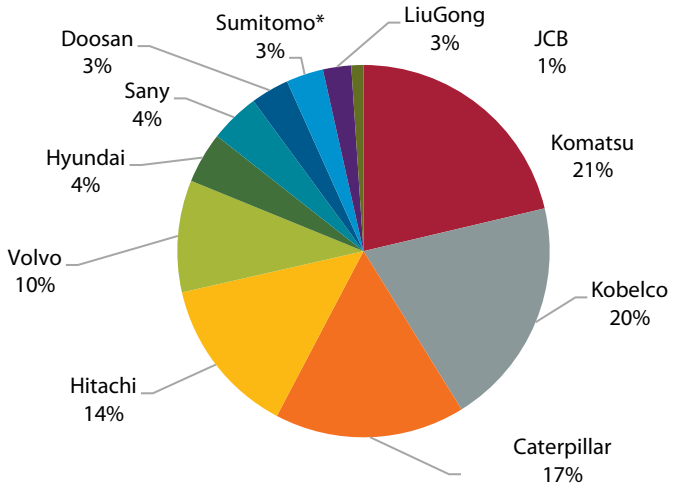
MARKET SHARES - CRAWLER EXCAVATORS

Table 53. Thailand: Suppliers of Crawler Excavators and Their Market Shares, 2012-2013

	2012		2013	
	Units	%	Units	%
Komatsu	1,020	21	870	21
Kobelco	1,085	22	811	20
Caterpillar	855	17	675	16
Hitachi	784	16	561	14
Volvo	503	10	397	10
Hyundai	176	4	181	4
Sany	106	2	177	4
Doosan	176	4	136	3
Sumitomo*	116	2	132	3
LiuGong	40	1	100	2
JCB	23	-	43	1
XCMG	2	-	20	-
Zoomlion	10	-	14	-
Liebherr	1	-	-	-
Total	**4,897**	**100**	**4,117**	**100**

* Sumitomo = Combined sales of Leadway Heavy Machinery and Krung Thai
Source: Off-Highway Research

Chart 30. Thailand: Suppliers of Crawler Excavators and Their Market Shares, 2013



Source: Off-Highway Research

Komatsu was the leading supplier in 2013, although continues to face increasing competition from its main rival, Kobelco. Its dealer, Bangkok Komatsu, entered a joint venture partnership with the Japanese manufacturer in April 2010, which bought a 40 per cent shareholding in the company, and has the advantage of being able to source its main product offering (PC70, PC130, PC160, PC200, PC300) from a plant within the country. This not only enables the company to react quickly to fluctuations in market demand, but also enables it to exploit the marketing potential of Japanese build quality and brand image combined with the 'made in Thailand' tag, both factors that appeal strongly to Thai contractors and government buying departments. Significantly, Komatsu's brand image and quality of after-sales support enables it to achieve premium prices for its excavators in the Thai market.

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The major selling product is the 20 tonne PC200 model, which accounts for around 75 per cent of Komatsu's annual crawler excavator sales and in 2013 won a market share of approximately 20 per cent in the important 20 tonne class. The company is also the second leading supplier, behind Kobelco, in the growing 13 and 16 tonne sectors, and has recently established a foothold in the midi excavator sector with its PC70 model. During the last five years Komatsu has increased its marketing focus on the highly lucrative mining sector and is the market leader in the weight classes above 100 tonnes. In 2012 it won orders for four 300 tonne PC3000 shovels from EGAT for use in lignite mines.

Kobelco is a major alternative to Komatsu for many buyers and achieved market leadership of the crawler excavator sector in 2012. Its dealer, Ariya Equipment, has over 30 years' experience of selling for Kobelco in Thailand, and more recently has been awarded the official Kobelco franchise for Laos and Cambodia; it is arguably the biggest Kobelco dealer in the world.

Kobelco produces its 13, 20 and 30 tonne excavators in Thailand, which gives it a national identity and some advantage in tender business. It naturally achieves a high market share in the 20 tonne class with the SK200 model, but in 2013 also gained market leadership in the midi excavator sector with its 7 tonne SK75 machine. The 13-14 tonne class had developed strongly during the last two years and Kobelco has quickly established itself as the leader in this class with the SK140 model.

The third of the major suppliers is **Caterpillar**, whose dealer Metro Machinery sources its excavators from the Caterpillar plants in Japan and China. In the past it has been the market leader and has probably lost that position purely because of the local producer status of its rivals. The dealer has a reputation for a very high level of after-sales service and is active with Caterpillar Finance packages for the private sector.

Hitachi has increased its market share significantly in the 20 tonne excavator sector, where it now competes with Caterpillar for third position. It offers both a lower specification 20 tonne product made in Indonesia, and a Japanese machine of similar size with a Tier III engine. The company is particularly strong in the large excavator sectors above 30 tonnes, where it frequently achieves 100 per cent of the market.

Volvo's Korean built excavators are sold through its long established importer Italthai Industrial. The company has worked hard to overcome the perceived image problems associated with Korean products and has successfully increased its market penetration during the last two years as a result of an aggressive marketing strategy and more competitive pricing. The dealer has expanded its regional distribution network considerably during the last three years and the addition of extra sales personnel has begun to reap dividends for the company.

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Higher prices compared to the two domestic producers, Komatsu and Kobelco, have been a perennial problem for the other Korean suppliers but also the image, which is still that they trail behind the Japanese alternatives in technology and quality. There is, however, evidence to suggest that Korean products are finally gaining increasing acceptance amongst Thai contractors. **Hyundai**'s dealer, AVN, has focused heavily on increasing its after-sales support and branch network during the last two years, and its efforts have been rewarded accordingly. The expansion of the market in 2012 and 2013 also enabled it to take advantage of other competitors' supply problems.

Sany is the leading Chinese supplier and benefited from a single order for 90 machines in 2013 from Unique Engineering and Construction PCL, one of the largest construction companies in Thailand. Chinese manufacturers are unable to compete against the established suppliers to the same extent as they do in the wheeled loader sector, since their pricing levels are far closer and the arduous conditions in which crawler excavators generally operate favour the superior technology and reliability of products from Japanese and Western manufacturers.

Doosan has been with DKSH, formerly Diethelm, since 1999, when that company lost the Samsung franchise and took over Daewoo from a sister company of Krung Thai. Its best year was its first, when it took seven per cent of the market, although it now achieves a smaller but stable market share. Approximately 85 per cent of sales are of the 21 tonne DX225 model, although the dealer has recently achieved notable penetration in the 35 tonne sector.

Sumitomo excavators have been with Krung Thai for more than 20 years and, since 2012, with Leadway Heavy Machinery. The appointment of Leadway has resulted in a dramatic improvement in the Japanese manufacturer's performance in the Thai market. Much of the company's success has come as a result of shrewd personnel appointments, and a high level of after sales support to its Thai customers. The 21 tonne SH210 crawler excavator, sourced from Sumitomo's Indonesian plant, accounts for around 75 per cent of sales. The bulk of remaining sales are split between the smaller SH130 and 35 tonne SH350 model, also sourced from Indonesia. Incremental sales of the Japanese sourced SH480 and SH240 models have also been made during the last two years.

MARKET SHARES - WHEELED EXCAVATORS

In the wheeled excavator sector, only the three Korean suppliers actively market new machines. The wheeled type is popular in Korea and accounts for a third of the country's production; in Japan it barely exists and accounts for only one per cent of output. That perhaps explains the presence of new wheeled excavators in the stockyards of the Korean machinery importers.

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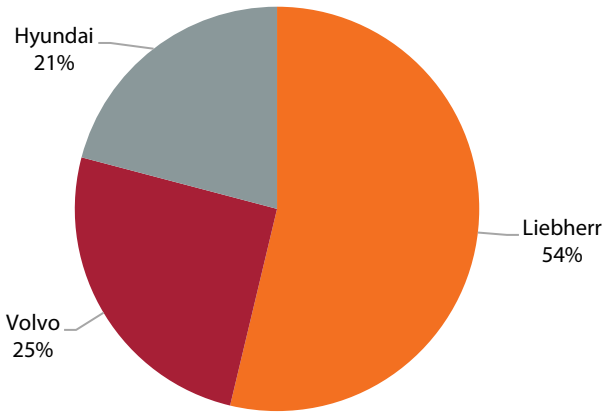
Table 54. Thailand: Suppliers of Wheeled Excavators and Their Market Shares, 2012-2013

	2012		2013	
	Units	%	Units	%
Doosan	15	46	15	63
Volvo	13	39	6	25
Hyundai	5	15	3	12
Total	**33**	**100**	**24**	**100**

Source: Off-Highway Research

Chart 31. Thailand: Suppliers of Wheeled Excavators and Their Market Shares, 2013



Source: Off-Highway Research

In the last two years, only the **Volvo** importer, Italthai Industrial, **Hyundai** importer, AVN Motor Works, and DKSH, the **Doosan** importer, have recorded any sales.

The full list of suppliers is shown below. Details of dealer networks are in the Company Profiles.

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Table 55. Thailand: Distribution Networks of Hydraulic Excavators, 2014

Manufacturer	Distributor
Caterpillar	Metro Machinery
Doosan	DKSH
Hitachi	Hitachi Construction Machinery (Thailand)
Hyundai	AVN Motor Works
JCB	Siam Motor Parts
Kobelco	Ariya Equipment
Komatsu	Bangkok Komatsu
Liebherr	Paragon Machinery
Lishide	SA Tractor
LiuGong	Yontrakarn
New Holland	Empire Tech
Sany	Thai Yont
Sumitomo	Leadway, Krung Thai
Sunward	Sunrise Machinery Group
Volvo	Italthai Industrial
XCMG	OCR
Xiagong	Siam Sun Auto
Zoomlion	Chu Kai

Source: Company Information

POPULATION AND END-USERS

Table 56. Thailand: Population of Hydraulic Excavators by Type of User, 2014

	Crawler		Wheeled	
	Units	%	Units	%
Agriculture	1,500	5	15	5
Construction				
– Civil Engineering	12,000	40	-	-
– General	7,800	26	180	60
– Road Authorities	3,600	12	-	-
– Water Resources/Irrigation (State)	2,100	7	-	-
Industry	600	2	75	25
Quarries and Mines	900	3	-	-
Rental Companies	1,500	5	30	10
Total	**30,000**	**100**	**300**	**100**

Source: Off-Highway Research

Private contractors appear dominant in the population of excavators because they are holding on to hundreds of old machines. Secondly, the private sector contains numerous small operators who buy machines very cheaply and try to break into major contracts with low prices. Over 75 per cent of the population consists of 20 tonne crawler excavators, although during the last three years 13 and 16 tonne machines have grown in prominence in line with the declining availability of cheap manual labour.

Sales to government users form only about 10 per cent of the market today since much of the work undertaken by the government is sub-contracted to private construction companies. The state sector in total probably owns around 5,000 hydraulic excavators, spread around the Department of Highways, the Royal Irrigation Department and EGAT, the power generator.

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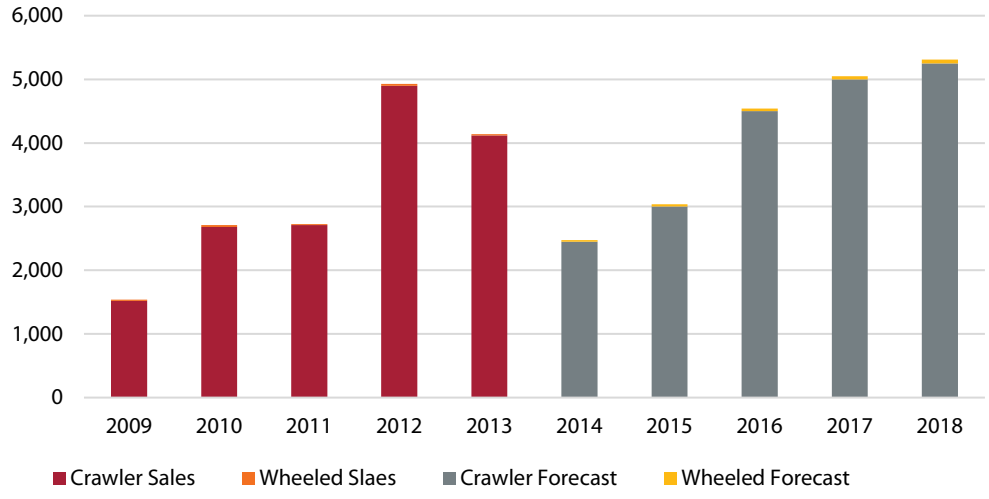
FORECAST

Table 57. Thailand: Forecast Sales of Hydraulic Excavators, 2014-2018 (Units)

	2014	2015	2016	2017	2018
Crawler	2,450	3,000	4,500	5,000	5,250
Wheeled	25	35	40	50	60
Total	**2,475**	**3,035**	**4,540**	**5,050**	**5,310**

Source: Off-Highway Research

Chart 32. Thailand: Forecast Sales of Hydraulic Excavators, 2009-2018 (Units)



Source: Off-Highway Research

The turbulent political situation currently prevalent in the country has stalled sales of construction equipment in the first half of 2014 as users postpone investment decisions until the situation becomes clearer. The majority of suppliers interviewed for the purposes of this study felt that sales would decline by 30-40 per cent by the end of the year, with the expectation of a modest recovery in 2015 and significantly more sustained growth towards the end of the forecast period.

Despite the past year's chaotic series of events, there is a pervading sense of optimism within many sectors of industry and commerce about the prospects for renewed political stability and sustained economic growth in the medium to long term, as the country seeks to develop its role as the main business hub within the forthcoming ASEAN Economic Community. Indeed, the interim military government's pledges of massive investment in infrastructure projects suggest a buoyant outlook for the crawler excavator sector.

Whilst the 20 tonne class will continue to account for the vast majority of demand for crawler excavators in the construction sector, there has been a discernible trend in recent times towards the use of smaller excavators in the 8, 13 and 16 tonne classes, which suppliers believe will remain a feature of the industry in the long term. The argument in favour of these machines is that they are more versatile than the larger excavators and can be used in a greater variety of applications, can be transported on 10-wheel trucks instead of a trailer, and are cheaper to buy and have

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lower fuel consumption. In the case of 13 tonne excavators, the fitment of a long reach boom renders the machine considerably more productive.

Conversely, the trend towards higher capacity excavators in the quarry sector remains a salient feature of the market, and sales of 35-40 tonne machines and above are expected to rise during the forecast period. The normal life cycle for excavators in this industry is six to seven years, although in recent years this has been extended by quarry operators to 10-12 years. As a result, many of these machines are in urgent need of replacement and the instigation of fleet replacement programmes will help to sustain a stable level of demand in the medium term.

Of critical importance to the pattern of future demand, however, will be the government's resolve to implement a range of proposed infrastructure projects that have been held up in recent years as a result of economic and political uncertainty. All of these projects will be of significant interest to suppliers of hydraulic excavators.

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MACHINES AVAILABLE

Table 58. Thailand: Crawler Excavators Available, 2014

Manufacturer	Model	HP	Manufacturer	Service Weight (Tonnes)	Product Source
Caterpillar	307D/SB	54	Caterpillar	7.2-8.4	Japan
	308D SB	55	Caterpillar	8.0	Japan
	315D/DL	115	Caterpillar	16.4-16.8	Japan
	318C	125	Caterpillar	19.7	Japan
	319D	115	Caterpillar	20.0	Japan
	320D	138	Caterpillar	19.8	Indonesia
	320D L	138	Caterpillar	21.0	Japan
	323D L	138	Caterpillar	22.4	Japan
	345D L	345	Caterpillar	45.0	Japan
	349D L	379	Caterpillar	47.6	Japan
	374D L	476	Caterpillar	71.1	Japan
	390D L	476	Caterpillar	85.0	Japan
Doosan	DX140LC	95	Doosan	14.0	Korea
	DX180LC	118	Doosan	17.7	Korea
	DX225LC	148	Doosan	21.5	Korea
	DX255LC	166	Doosan	24.6	Korea
	DX300LC	197	Doosan	29.3	Korea
	DX350LC	271	Doosan	35.2	Korea
	DX420LC	292	Doosan	40.9	Korea
	DX480LC	329	Doosan	47.5	Korea
	DX520LC	329	Doosan	49.9	Korea
Hitachi	ZX70	52	Isuzu	6.4	Japan
	ZX110	85	Isuzu	10.4	Japan
	ZX120	88	Isuzu	12.0	Indonesia
	ZX160LC	110	Isuzu	15.7	Japan
	ZX180LC	119	Isuzu	17.9	Japan
	ZX200-3	147	Isuzu	19.8	Indonesia
	ZX240-3	177	Isuzu	23.4	Japan
	ZX270-3	188	Isuzu	27.3	Japan
	ZX330LC-3	271	Isuzu	31.6	Indonesia
	ZX400LCH-3	271	Isuzu	39.0	Japan
	ZX470H-3	348	Isuzu	47.1	Japan
	ZX520LC-3	348	Isuzu	52.0	Japan
	ZX670LC-3	462	Isuzu	68.0	Japan
	ZX870LC-3	532	Isuzu	83.0	Japan
	EX1200-6	760	Hitachi	144.0	Japan
	EX1900-6	1,086	Hitachi	192.0	Japan
	EX2500-6	1,400	Cummins	248.0	Japan
	EX3600-6	1,944	Hitachi	361.0	Japan
	EX5500-6	2,800	Cummins	522.0	Japan
	EX8000-6	3,880	Hitachi	811.0	Japan
Hyundai	Robex 110-7	85	Mitsubishi	11.2	Korea
	Robex 140LC-7	115	Cummins	14.0	Korea
	Robex 160LC-7	126	Mitsubishi	17.4	Korea
	Robex 180LC-7	126	Mitsubishi	18.2	Korea
	Robex 210LC-7	150	Cummins	21.7	Korea

Source: Company Information

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Table 59. Thailand: Crawler Excavators Available, 2014 (continued)

Manufacturer	Model	HP	Manufacturer	Service Weight (Tonnes)	Product Source
Hyundai cont'd	Robex 210LC-7 LR	150	Cummins	24.4	Korea
	Robex 250LC-7	178	Cummins	25.2	Korea
	Robex 290LC-7	213	Cummins	29.3	Korea
	Robex 320LC-7	259	Cummins	32.2	Korea
	Robex 360LC-7	280	Cummins	36.5	Korea

Source: Company Information

Table 58. Thailand: Crawler Excavators Available, 2014 (Continued)

Manufacturer	Model	HP	Manufacturer	Service Weight (Tonnes)	Product Source
Hyundai	Robex 450LC-7	353	Cummins	44.9	Korea
Cont'd	Robex 500LC-7	325	Cummins	48.8	Korea
	Robex 800LC-7	510	Cummins	82.3	Korea
JCB	JS200	127	Cummins	20.0	India
	JS210	172	Isuzu	21.7	India
Kobelco	SK75-8	55	Isuzu	7.3	Japan/China
	SK130-8	99	Isuzu	14.7	Thailand
	SK200-8	153	Isuzu	20.2	Thailand
	SK210LC-8	153	Isuzu	20.6	Thailand
	SK250/LC	184	Isuzu	24.6-25.1	Thailand
	SK330-8	264	Isuzu	33.6	Thailand
	SK350LC-8	264	Isuzu	34.3	Thailand
	SK480LC-8 ME	326	Isuzu	51.2	China
	SK850LC ME	496	Isuzu	78.7	China
Komatsu	PC70-8	65	Komatsu	6.6	Thailand
	PC130-8	86	Komatsu	13.0	Thailand
	PC160	113	Komatsu	16.0	Thailand
	PC200-8	143	Komatsu	20.8	Thailand
	PC300LC-8	241	Komatsu	31.5	Thailand
	PC300-8	241	Komatsu	33.5	Thailand
	PC350-8	242	Komatsu	32.3	Japan
	PC450-8	330	Komatsu	43.0	Japan
	PC600-8	385	Komatsu	56.6	Japan
	PC600-8R	429	Komatsu	60.0	Japan
	PC750-8	454	Komatsu	73.2	Japan
	PC800-8	454	Komatsu	75.6	Japan
	PC1250-8	672	Komatsu	110.9	Japan
	PC2000-8	956	Komatsu	200.0	Japan
	PC4000-6	1,775	Cummins	398.0	Germany
Sany	SY230C-8	170	Isuzu	23.0	China
	SY460C	320	Mitsubishi	46.0	China
Sumitomo	SH80-3B	54	Isuzu	7.9	China
	SH130-5	95	Isuzu	12.3	Indonesia
	SH160-5	120	Isuzu	16.6	Japan
	SH210-5	158	Isuzu	20.0	Indonesia
	SH240-5	177	Isuzu	24.4	Japan
	SH350HD-5	271	Isuzu	35.6	Indonesia
	SH480LHD-5	362	Isuzu	47.2	Japan
	SH700LHD-5	464	Isuzu	68.1	Japan
	SH800LHD-5	534	Isuzu	80.0	Japan
Volvo	EC140B	93	Volvo	15.2	Korea
	EC180B	109	Volvo	19.0	Korea
	EC210B	143	Volvo	21.9	Korea
	EC240B	168	Volvo	25.8	Korea
	EC290B	192	Volvo	29.9	Korea
	EC330B	247	Volvo	34.0	Korea

Source: Company Information

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Table 58. Thailand: Crawler Excavators Available, 2014 (continued)

Manufacturer	Model	HP	Manufacturer	Service Weight (Tonnes)	Product Source
Volvo cont'd	EC360B	247	Volvo	38.4	Korea
	EC460B	306	Volvo	47.9	Korea
	EC700B	424	Volvo	70.0	Korea

Source: Company Information

Table 58. Thailand: Crawler Excavators Available, 2014 (Continued)

Manufacturer	Model	HP	Manufacturer	Service Weight (Tonnes)	Product Source
XCMG	XE135B	93	Isuzu	13.8	China
	XE215C	143	Isuzu	21.4	China
	XE335C	247	Isuzu	33.8	China
Xiagong	XG815LC	93	Isuzu	13.9	China
Zoomlion	ZE210E	150	Cummins	21.3	China

Source: Company Information

Table 60. Thailand: Wheeled Excavators Available, 2014

Manufacturer	Model	HP	Manufacturer	Service Weight (Tonnes)	Product Source
Caterpillar	M313D	115	Caterpillar	14.4	France
	M315D	129	Caterpillar	16.1	France
	M316D	138	Caterpillar	17.7	France
	M318D	151	Caterpillar	19.1	France
	M322D	164	Caterpillar	22.2	France
Doosan	DX140W	130	Doosan	15.3	Korea
	DX160W	130	Doosan	16.1	Korea
	DX190W	155	Doosan	18.8	Korea
	DX210W	160	Doosan	20.8	Korea
Hyundai	R140W-7	115	Cummins	14.0	Korea
	R170W-7	116	Mitsubishi	17.5	Korea
	R200W-7	166	Cummins	20.5	Korea
Volvo	EW145B	122	Volvo	15.0	Germany
	EW160C	142	Volvo	18.0	Germany

Source: Company Information

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MINI EXCAVATORS

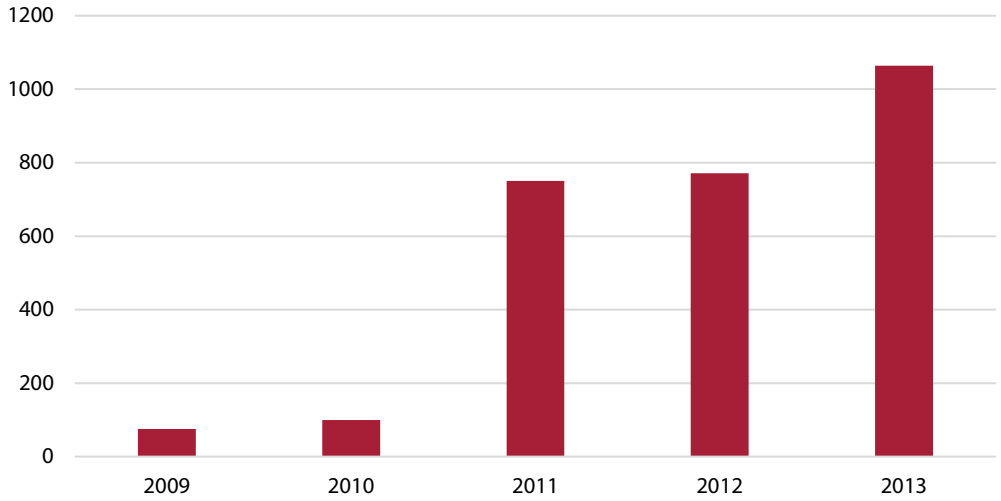
MARKET SIZE AND TRENDS

Table 61. Thailand: Sales of Mini Excavators, 2009-2013 (Units)

2009	2010	2011	2012	2013
75	100	750	771	1,064

Source: Off-Highway Research

Chart 32. Thailand: Sales of Mini Excavators, 2009-2013 (Units)



Source: Off-Highway Research

The usage of mini excavators in Thailand has historically been low due to competition from plentiful and cheap manual labour in the construction industry. As a result, volumes sold have been small and few suppliers have put any priority on marketing the product. During the last three years, however, the rising cost and declining availability of immigrant labour has seen an explosion in demand for the product, a trend stimulated in large part by a highly successful marketing campaign by Kubota, which currently commands a market share of over 90 per cent. Sales are concentrated in the 3.5 and 5 tonne classes and demand has been furnished primarily by private contractors engaged in small-scale general construction and irrigation applications, although a smaller volume of business has also been generated within the agricultural sector.

Issues such as fuel consumption, ease of transportation and manoeuvrability on restricted job sites, particularly in inner city areas, are being increasingly scrutinised by operators, and the relatively cheap running costs of a mini excavator represent an important consideration in a market where contract profit margins are becoming increasingly squeezed.

In past years used machines have been exported from Japan to Thailand at a rate of 1,200 to 1,500 units per year, although it is impossible to gauge how many remain in Thailand, since many of them are onward shipped to neighbouring countries such

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as Laos and Cambodia. Declining availability and rising prices of second-hand construction equipment from Japan in recent years, however, has resulted in much smaller volumes being imported. Furthermore, the advent of competitively priced new mini excavators from Kubota, available on highly attractive finance terms, has also been instrumental in stemming the tide of Japanese imports.

PRODUCTION

No domestic production

MARKET SHARES

Kubota has taken the mini excavator market by storm. The company began importing the product in 2008, but has made massive strides during the last two years following an aggressive marketing campaign that has included television advertising and a nationwide customer education programme. Sales have been stimulated, too, by the company's highly flexible leasing scheme, administered through its own subsidiary Siam Kubota Leasing, and which enables customers to spread payments over as much as five years.

Table 62. Thailand: Suppliers of Mini Excavators and Their Market Shares, 2012-2013

	2012		2013	
	Units	%	Units	%
Kubota	750	97	1,000	94
JCB	-	-	20	2
Volvo	5	1	19	2
Takeuchi	8	1	10	1
Hyundai	5	1	6	1
Caterpillar	-	-	5	-
Bobcat	2	-	2	-
Hitachi	1	-	2	-
Total	**771**	**100**	**1,064**	**100**

Source: Off-Highway Research

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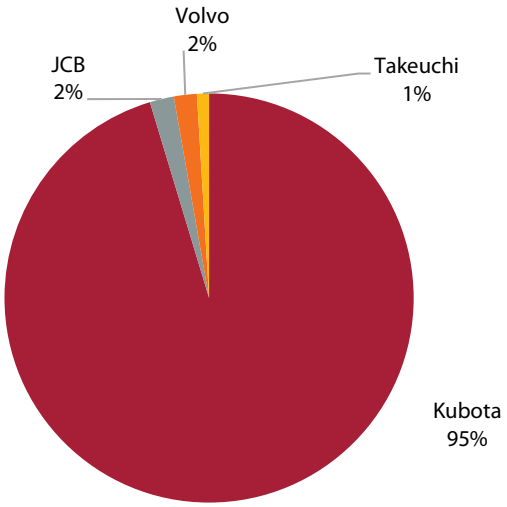
Chart 33. Thailand: Suppliers of Mini Excavators and Their Market Shares, 2013



Source: Off-Highway Research

Kubota's high visibility in the market owes much to its comprehensive distribution network, which comprises more than 200 agricultural tractor dealers. Although the dealer network is clearly set up to market the company's range of agricultural equipment, it sells the majority of mini excavators to the construction sector and the bulk of stock machines are fitted with hammer pipework. The most popular models are the 3.5 tonne and 5 tonne machines, which are widely used in inner city construction sites and on land drainage duties and pond construction in the agricultural sector. Competitive suppliers bemoan the fact that they are marketed with extremely aggressive pricing.

In reality mini excavators are of no interest to most importers and they have made little effort to promote them. The achievements of Kubota have, however, been duly noted and have already encouraged several suppliers to conduct their own market studies with a view to exploiting what most recognise is a fast developing product sector.

The full list of suppliers is shown below. Details of dealer networks are in the Company Profiles.

Table 63. Thailand: Distribution Networks of Mini Excavators, 2014

Manufacturer	Distributor
Bobcat	Italthai Industrial
Caterpillar	Metro Machinery
Hitachi	Hitachi Construction Machinery (Thailand)
Hyundai	AVN Motor Works
JCB	Siam Motor Parts
Kobelco	Ariya Equipment
Komatsu	Bangkok Komatsu
Kubota	Siam Kubota
Takeuchi	United Motor Works (Siam)
Yanmar	Krung Thai Tractor

Source: Off-Highway Research

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POPULATION AND END-USERS

The main end-user segments are small contractors and agriculture. The high volume of sales by Kubota during the last three years has expanded the population enormously and it is now estimated to be in the region of 5,000 units. Few rental companies offer mini excavators actively, although the leading Japanese rental operators and MTS, the Cat Rental Store in Bangkok, have begun to recognise the growing potential of the product.

FORECAST

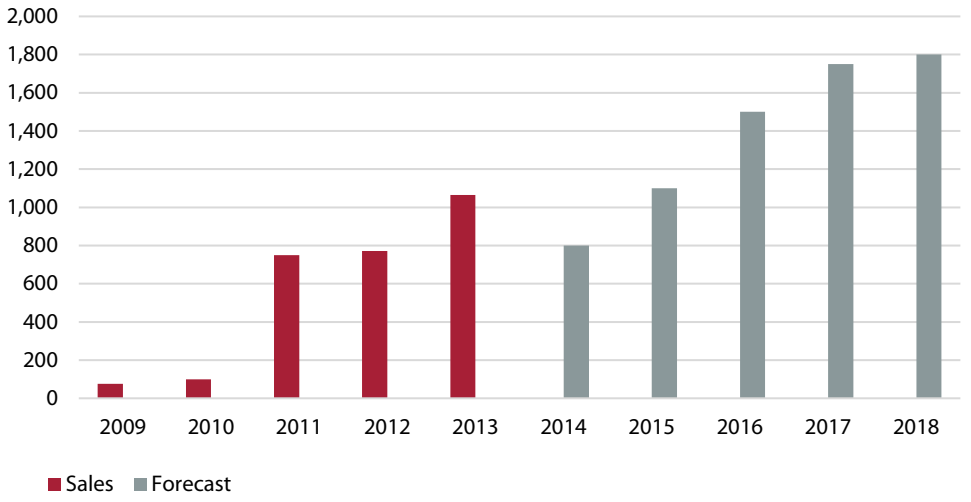
The outlook for compact equipment is very favourable and suppliers interviewed for the purposes of this study were unanimous in their belief that demand for mini excavators will grow significantly in the medium to long term. Urban transformation projects will underpin much of this growth, although land irrigation and water management projects can be expected to furnish increasing demand for the product.

Table 64. Thailand: Forecast Sales of Mini Excavators, 2014-2018 (Units)

2014	2015	2016	2017	2018
800	1,100	1,500	1,750	1,800

Source: Off-Highway Research

Chart 34. Thailand: Forecast Sales of Mini Excavators, 2009-2018 (Units)



Source: Off-Highway Research

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MACHINES AVAILABLE

Table 65. Thailand: Mini Excavators Available, 2014

Manufacturer	Type	Model	HP	Manufacturer	Service Weight (Tonnes)	Product Source
Bobcat	Standard	316	10	Kubota	0.8	USA
		323	13	Kubota	1.7	USA
		325	28	Kubota	2.8	USA
		329	28	Kubota	3.2	USA
		331	40	Kubota	3.3	USA
		331E	40	Kubota	3.6	USA
		430	43	Kubota	3.6	USA
		335	40	Kubota	4.2	USA
		435	49	Kubota	4.8	USA
		337	48	Kubota	5.0	USA
Caterpillar	Standard	301.6C	18	Caterpillar	1.7	Japan
		301.8C	18	Caterpillar	1.8	Japan
		302.5C	25	Caterpillar	2.9	Japan
	Zero Tailswing	303C CR	30	Caterpillar	3.3	Japan
		303.5C CR	39	Caterpillar	3.7	Japan
		304CR	42	Caterpillar	4.8	Japan
		305C CR	48	Caterpillar	5.2	Japan
Hyundai	Standard	R15-7	17	Mitsubishi	1.6	Japan
		R16-7	17	Mitsubishi	1.6	Japan
		R22-7	17	Mitsubishi	2.2	Japan
		R28-7	24	Mitsubishi	2.8	Japan
		R35-7	27	Mitsubishi	3.3	Japan
		R55-7	53	Yanmar	5.7	Korea
	Zero Tailswing	R36N-7	27	Mitsubishi	3.6	Japan
JCB		8015	18	Perkins	1.6	UK
		8017	19	Perkins	1.7	UK
		8018	18	Perkins	1.8	UK
		802 Super	32	Perkins	2.5	UK
		8027 Super	27	Perkins	2.8	UK
		803 Plus/Super	26	Perkins	3.0	UK
		804 Super	27	Perkins	3.5	UK
		8052	43	Perkins	5.2	UK
		8060	57	Perkins	6.0	UK
	Zero tailswing	8027 ZTS	27	Perkins	2.7	UK
		8032 ZTS	27	Perkins	3.2	UK
Kobelco	Zero tailswing	SK20SR	21	Yanmar	2.2	Japan
		SK27SR	21	Yanmar	2.6	Japan
		SK30SR	28	Yanmar	3.1	Japan
		SK35SR	28	Yanmar	3.7	Japan
		SK40SR	41	Yanmar	4.6	Japan
Kubota	Standard	KX61	23	Kubota	2.5	Japan
		KX101	28	Kubota	3.5	Japan
		KX057	46	Kubota	5.5	Japan
Komatsu	Standard	PC09	9	Komatsu	0.9	Japan
		PC60-7	50	Komatsu	5.9	Japan
	Zero tailswing	PC30MR-2	28	Komatsu	3.1	Japan
		PC35MR-2	29	Komatsu	3.6	Japan
		PC40MR-2	39	Komatsu	4.8	Japan
Takeuchi	Standard	TB016	12	Yanmar	1.5	Japan
		TB228	23	Yanmar	2.7	Japan
		TB250	38	Yanmar	4.8	Japan

Source: Company Information

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MOBILE COMPRESSORS

MARKET SIZE AND TRENDS

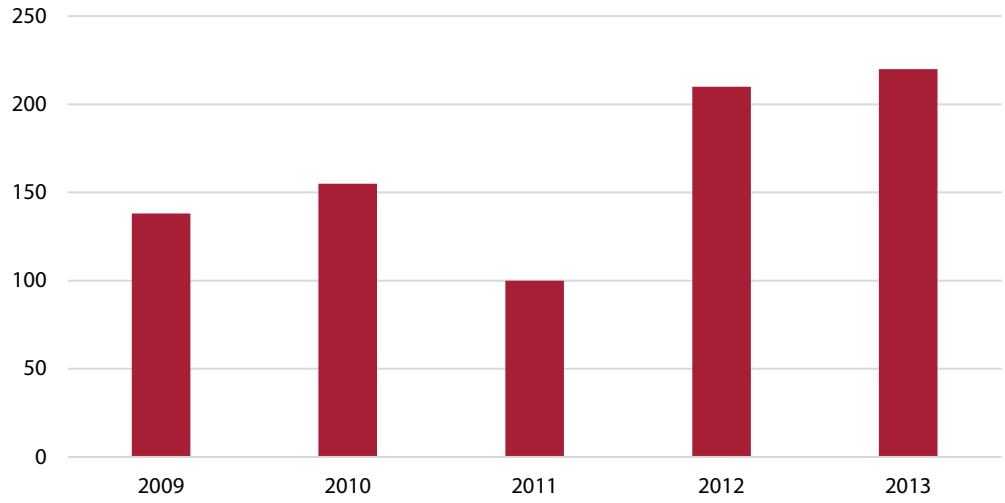
The product analysed here is the mobile, screw type compressor, driven by a diesel engine and mounted on wheels or a skid. Skids are popular, as unloading cranes lift them off the rental companies' trucks and it is convenient to store them in stacks. In the yards they are often mixed with generators, which are boxed in similar sized casings; on the urban job site it is similarly convenient to save space by storing them in stacks.

Table 66. Thailand: Sales of Mobile Compressors, 2009-2013 (Units)

2009	2010	2011	2012	2013
138	155	100	210	220

Source: Off-Highway Research

Chart 35. Thailand: Sales of Mobile Compressors, 2009-2013 (Units)



Source: Off-Highway Research

The age when small mobile compressors used with air hammers and breakers dominated the construction industry ended in 1997. The hydraulic breaker mounted on an excavator arm has replaced it. Paradoxically the collapse of the earthmoving market brought about this fall from favour, because 20 tonne hydraulic excavators have been in constant oversupply since then and the hydraulic breaker has nullified demand for small compressors of less than 6.0 m^3/min air output.

Annual sales of all sizes fell from 400 units in the good years before 1997 to 50-70 units per year. Many good quality units were exported and used machines piled up in the yards of dealers, brokers and owners. Before 2004 it was very obvious that rental companies owned too many machines and had great difficulty renting them out. Sales of new mobile compressors picked up in 2005 and 2006 to 170 units but declined in the subsequent two years as political turmoil and instability came to the fore once more. In 2009 and 2010 the market embarked on a phase of modest recovery, declined sharply in 2011 following the flood crisis, and rose again in 2012

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and 2013. As in nearly every other product sector the demand for new machines is restrained by the attraction of used compressors imported from Japan.

Large mobile compressors had a place in foundation works and in civil engineering for ports, new roads and airports in the past and would still do so today, if those projects were still on-going. Water well drilling would demand 80 new large compressors per year before 1997 but that market fell in terms of numbers to only 15 units per year after 1998. The rest of the market is centred on machines around 5.0 m^3/min and 11 m^3/min, rated as 'small' machines.

High-pressure models, working at 10, 12 or even 18 bar, are often used in drilling applications, for instance, in the cleaning of the area round the drill head or the powering of smaller, exploratory drillings. The compressors concerned are often truck-mounted rather than on wheels.

PRODUCTION

No local production.

MARKET SHARES

The market divides into two types, low and high pressure. The low-pressure machines, working at 7 bar, account for about 80 per cent of the sales in 2013, for example. In that area Hokuetsu products, sold with the brand name of **Airman**, and **Atlas Copco** are dominant, with a smaller share being won by **Ingersoll-Rand**, now branded as **Doosan Infracore**. In high-pressure machines **Atlas Copco** is the clear market leader, with **Doosan** trailing behind.

In 2003 **Atlas Copco** founded its own company in Thailand and ceased to be represented by Diethelm. The amicable parting of the ways led to the Swedish manufacturer occupying premises in the Wellgrow Estate in Bangpakong, home of Honda cars and many other large manufacturing operations, from where it directs a service operation with four branches round the country.

Table 67. Thailand: Suppliers of Mobile Compressors and Their Market Shares, 2012-2013

	2012		2013	
	Units	%	Units	%
Atlas Copco	105	50	110	50
Doosan Infracore	65	31	70	32
Airman	25	12	25	11
Kaeser	6	3	5	2
CompAir	5	2	5	2
Sullair	4	2	5	2
Total	**210**	**100**	**220**	**100**

Source: Off-Highway Research

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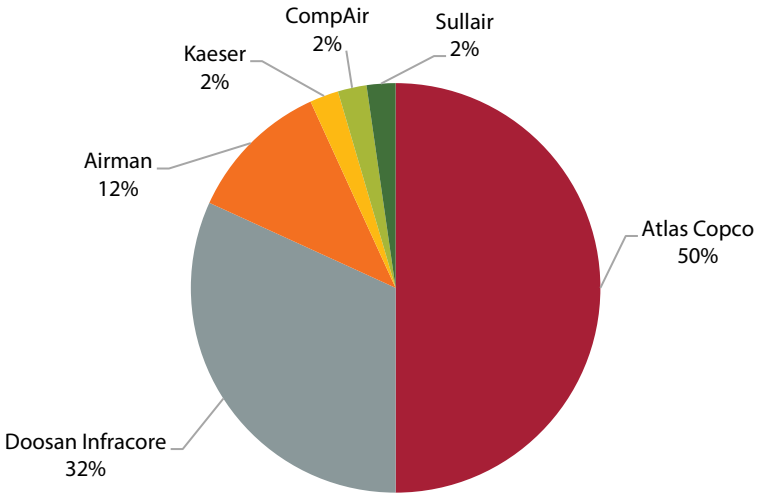
Chart 36. Thailand: Suppliers of Mobile Compressors and Their Market Shares, 2013



Source: Off-Highway Research

Airman products are sold on a non-exclusive basis by Krung Thai Tractor. Its business in new mobile compressors is not large and is overshadowed by the much greater volume of used machines that it sells. It is also an important renter of compressors. Several other much smaller businesses also sell Airman mobile compressors.

Doosan Infracore sells machines from the USA and has the benefit of a very high quality of after-sales service through its importer, Italthai Industrial.

The full list of potential suppliers is shown below.

Table 68. Thailand: Distribution Networks of Suppliers of Mobile Compressors, 2014

Manufacturer	Distributor
Atlas Copco	Atlas Copco Thailand
CompAir	Siam Motor Parts
Doosan	Italthai Industrial
Kaeser	Master Com Engineering

Source: Off-Highway Research

POPULATION AND END-USERS

Over the years many used mobile compressors have come into Thailand, either directly through contractors or through trade channels. Japan, Singapore and Australia have all been regular sources and it is estimated that when one adds these machines to those imported as new by the government sector and the more prosperous contractors, the total reaches 3,000 units.

Rental companies now dominate the industry, owning about 60 per cent of the machines. Some of the leading rental suppliers are TCJ Asia, Thaitec and Thai Rent All (a joint venture between Italian Thai and Nishio of Japan). They are often a

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source of used machines for the civil engineering contractors. In the government sector the largest owners are the Department of Highways, EGAT, and the power distribution agencies.

FORECAST

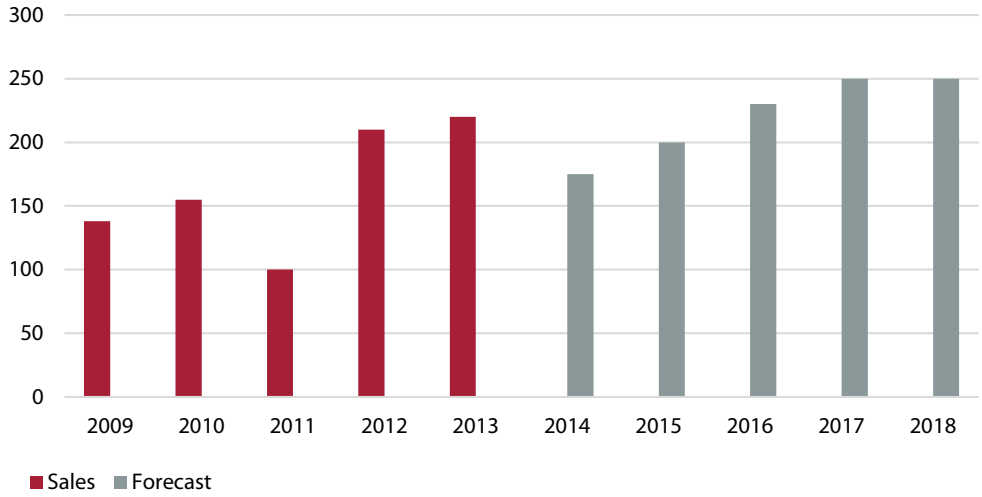
There is no possibility of turning back the clock and having mobile compressors in the position of all-purpose tool that they were in the 1980s. Nevertheless, there is much civil engineering work planned for the years to come and by concentrating on high outputs and high pressures, the suppliers could reach a yearly rhythm of 200 to 250 units.

Table 69. Thailand: Forecast Sales of Mobile Compressors, 2014-2018 (Units)

2014	2015	2016	2017	2018
175	200	230	250	250

Source: Off-Highway Research

Chart 37. Thailand: Forecast Sales of Mobile Compressors, 2009-2018 (Units)



Source: Off-Highway Research

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MACHINES AVAILABLE

Table 70. Thailand: Mobile Compressors Available, 2014

Manufacturer	Model	Air Delivery (m^3/Min)	HP	Manufacturer	Weight (Kg)	Product Source
Airman	PDS130S	3.5	38	Isuzu	830	Japan
– Wheeled	PDS185S	5.0	52	Isuzu	915	Japan
	PDS265S	7.5	80	Isuzu	1,480	Japan
	PDS375S	10.6	100	Isuzu	2,030	Japan
	PDS390S	11.0	110	Isuzu	2,240	Japan
	PDS655S	18.5	190	Hino	3,550	Japan
	PDS750S	21.2	195	Hino	3,675	Japan
	PDSE900	25.0	294	Cummins	4,500	Japan
– Skid	PDS50S	1.4	16	Isuzu	350	Japan
	PDS70S	2.0	21	Yanmar	490	Japan
	PDS90S	2.5	27	Isuzu	540	Japan
	PDS125S	3.5	38	Isuzu	710	Japan
Note: A wide range of high pressure models from PDSE900 (8.8 bar) to PDSK900S (25.5 bar) is also available.						
Atlas Copco	XAS 47	2.6	29	Deutz	635	Belgium
	XAS 67	3.7	44	Deutz	800-850	Belgium
	XAS 77	4.3	42	Deutz	800-850	Belgium
	XAS 97	5.3	48	Deutz	800-850	Belgium
	XAS 136	8.1	75	Deutz	1,515	Belgium
	XAS 186	11.1	114	Deutz	1,800	Belgium
	XAS 426	25.0	222	Mercedes	2,300	Belgium
Note: All the above have a working pressure of 7 bar. A range of high-pressure models is also available.						
CompAir	C20	2.0	21	Perkins	542	Germany
	C25	2.5	28	Deutz	694	Germany
	C30	3.0	30	Deutz	835	Germany
	C38GS	3.8	82	Deutz	1,100	Germany
	C42G	4.2	58	Deutz	1,100	Germany
	C50G	5.0	82	Deutz	1,100	Germany
	C76G	7.6	125	Deutz	1,100	Germany
	C125	13.2	125	Deutz	1,995	Germany
Notes: 1. All the above have a working pressure of 7 bar. A range of high-pressure models is also available. 2. Models where the name is followed by a G have a generator. Models followed by GS have a simultaneous air and electric current capability.						
Doosan	P185WJD	5.2	66	John Deere	917	USA
	XP185WJD	5.2	80	John Deere	1,034	USA
	P250WJD	7.1	78	John Deere	1,247	USA
	VHP300WIR	8.5	125	Ingersoll-Rand	2,083	USA
	HP375WIR	10.6	125	Ingersoll-Rand	2,083	USA
	XP375WIR	10.6	125	Ingersoll-Rand	2,083	USA
	P425WIR	12.0	125	Ingersoll-Rand	2,083	USA
	9/235	23.4	275	Ingersoll-Rand	4,085	Czech Republic
Note: A range of higher-pressure models at 10 to 12 bar is available in various sizes from 5.6m^3/min to 42.5 m^3/min.						

Source: Company Information

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MOBILE CRANES

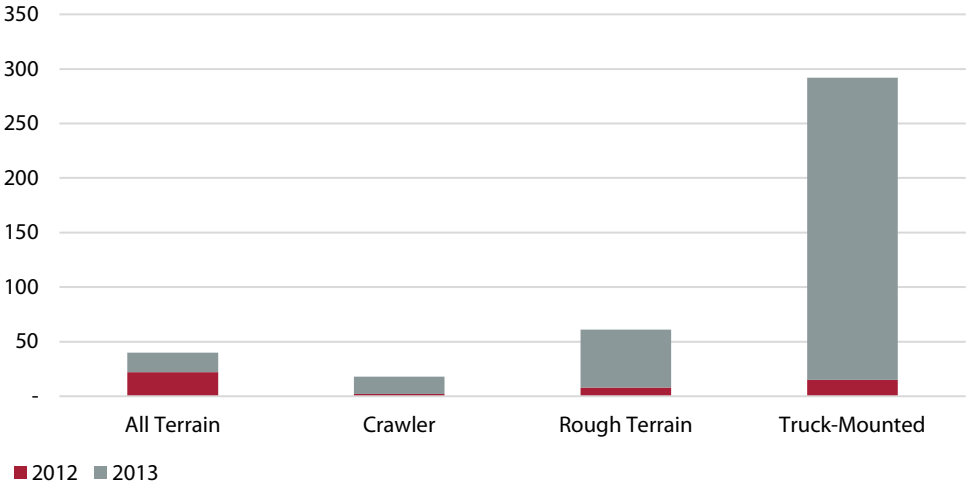
MARKET SIZE AND TRENDS

Table 71. Thailand: Sales of Mobile Cranes by Type, 2009-2013 (Units)

	2009		2013	
	Units	%	Units	%
All Terrain	22	47	18	5
Crawler	2	4	16	4
Rough Terrain	8	17	53	14
Truck-Mounted	15	32	277	77
Total	**47**	**100**	**364**	**100**

Source: Off-Highway Research

Chart 38. Thailand: Sales of Mobile Cranes by Type, 2009-2013 (Units)



Source: Off-Highway Research

Thailand is the largest crane market in Southeast Asia. The demand for new cranes has grown significantly during the last four years, primarily due to the dominance of the Chinese manufacturers Sany, Zoomlion and XCMG, who have all been quick to set up rental fleets and appoint dealers with long experience in the crane sector. Chinese truck-mounted cranes, which attract zero rate import tax, proliferate and demand has risen in response to the rising prices and declining availability of used cranes from Japan.

The traditional practice of buying second-hand cranes from Japan continues, but has declined in importance during recent years since the cost of a new truck crane from a Chinese supplier is invariably less than that of an equivalent used machine imported from Japan. It is estimated, however, that approximately 1,200 used cranes are still imported to Thailand each year, not only from Japan, but also from Malaysia, Singapore and Taiwan. Of this volume, rough terrain cranes are thought to comprise 50-60 per cent, truck cranes 10-20 per cent, crawler cranes 10 per cent, and compact cranes (7-10 tonnes) the remainder.

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Sales of new cranes are effectively shared between the crane hire companies, construction companies and industrial applications such as power plants and petrochemical installations. Government agencies such as the Royal Irrigation Department and Electricity Generating Authority of Thailand (EGAT) also constitute an occasional source of demand. In 2011 the Thai government announced a reduction of import tax on new cranes supplied by manufacturers outside the ASEAN region from 40 to 10 per cent, which has also acted as a stimulus to demand for new cranes, particularly in the private sector, traditionally the main users of used cranes.

In the new crane sector, the **truck-mounted** type is by some margin the most important in terms of volume. Chinese manufacturers dominate this sector, and Sany, Zoomlion and XCMG have all made major efforts to promote their products, not only in Thailand but throughout Southeast Asian markets. Although the Chinese machines are much less sophisticated than the Western alternatives, they offer lift capacity at more or less half price. Sales of more expensive truck cranes from outside the ASEAN region are generally confined to the major government departments, although there is still a demand for good used cranes from Japanese suppliers Tadano and Kato.

The most common size of truck-mounted crane is the 25 tonne class, which accounts for around 50 per cent of sales. The remaining 50 per cent of sales are of 30, 55 and 70 tonne machines. These are very keenly priced and are mainly used in built up areas or on prepared surfaces.

Within the **rough terrain** sector, the sizes most in demand are 25 and 50 tonnes, which are purchased primarily for civil engineering and industrial projects. Demand here is focused almost exclusively on second-hand Japanese cranes from Tadano and Kato. Occasional sales of new rough terrain cranes are made to government departments, the military or large construction companies.

The market for **all terrain** cranes remains small, due largely to their high prices. In recent years, however, several new crane hire companies have set up in the country and have started to rent all terrain cranes, a trend that is expected to continue. The market has also been sustained to some extent by the Chinese suppliers, who have supplied a number of new all terrain cranes to their own rental fleets.

Another source of steady demand for new all terrain cranes comes from the oil and gas industry for refinery work, and from petrochemical, cement and power plants for maintenance duties. These machines are invariably supplied by Liebherr and Tadano Faun and are typically specified with lift capacities of 400-500 tonnes. Occasional sales of lower capacity all terrain cranes are made to government departments for use on small scale lifting operations.

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There is very little interest at all in the private sector in buying new all terrain cranes and, since the German manufacturers all have centres for the overhaul of used cranes, they can sell very good quality machines all round the world.

Much of the demand for new and second-hand **crawler cranes** has traditionally been satisfied by Japanese manufacturers, specifically Kobelco and Hitachi-Sumitomo, or Western manufacturers such as Manitowoc and Terex Demag. More recently, however, both Zoomlion and Fuwa from China have penetrated the new crawler crane sector with sales to the crane rental sector. Up to 90 per cent of crawler cranes sold in Thailand are used machines imported from Japan of 55 or, more commonly, 80 tonnes' capacity and are all of the lattice boom variety. These sizes of crane are mainly sold to contractors engaged on large civil engineering and infrastructure programmes. High capacity crawler cranes of up to 750 tonnes are sold to the government's Ministry of Energy department for use on gas and oil refineries and petrochemical plants, and also for the erection of wind turbines.

PRODUCTION

No domestic production.

MARKET SHARES

The most significant development in the market during the last five years has been the advent of the Chinese suppliers **Sany**, **Zoomlion** and **XCMG**, all of whom have successfully established a foothold in the crane sector. Each of them has set up their own rental fleets and appointed an independent importer. Inevitably the primary attraction of Chinese cranes is the price, since parts availability and after sales support are currently not on a par with those of Western suppliers. Whilst this limits their appeal to private contractors who insist on optimum reliability and maintenance contracts, they have created growing interest with the rental companies who are in a position to offer their customers a replacement machine should any problems arise with the original unit.

Of the established manufacturers, **Tadano**, distributed by the highly regarded Italthai Industrial organisation, accounts for a high percentage of demand for new rough terrain cranes, whilst the same dealer has achieved notable success with the German built **Tadano Faun** all terrain crane line. **Liebherr** is active in both all terrain and crawler crane sectors and in 2014 has already secured orders for two 55 tonne and one 500 tonne all terrain cranes. **Kobelco** crawler cranes are keenly sought after in the used equipment sector but in 2013 the dealer, Ariya Equipment, was also able to sell two new 150 tonnes' capacity machines.

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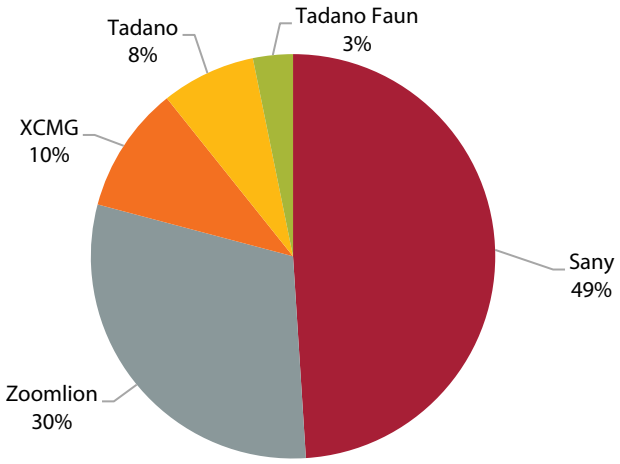
Table 72. Thailand: Suppliers of Mobile Cranes and Their Market Shares, 2013

	Units	%
Sany	169	47
Zoomlion	104	28
XCMG	35	10
Tadano	26	7
Tadano Faun	11	3
Fuwa	5	1
Kato	5	1
Liebherr	4	1
Kobelco	2	-
Terex	2	-
Hitachi-Sumitomo	1	-
Total	**364**	**100**

Source: Off-Highway Research

Chart 39. Thailand: Suppliers of Mobile Cranes and Their Market Shares, 2013



Source: Off-Highway Research

The full list of suppliers is shown below.

Table 73. Thailand: Distribution Networks of Mobile Cranes, 2014

Manufacturer	Distributor
Fuwa	Direct Sales
Grove	Metro Cranes
Hitachi-Sumitomo	Tat Hong
Kato	Siam Industrial
Kobelco	Ariya
Liebherr	Liebherr Thailand
Manitowoc	Manitowoc Singapore
Sany	Max Crane
Tadano/Tadano Faun	Italthai Industrial
Terex – Crawler	Mobile Cranes Asia, Singapore, Thai Enc
Terex – AT/RT	DKSH
Terex – Truck Mounted	Leadway Heavy Machinery
XCMG	TMC Industrial, OCR
Zoomlion	Chu Kai

Source: Off-Highway Research

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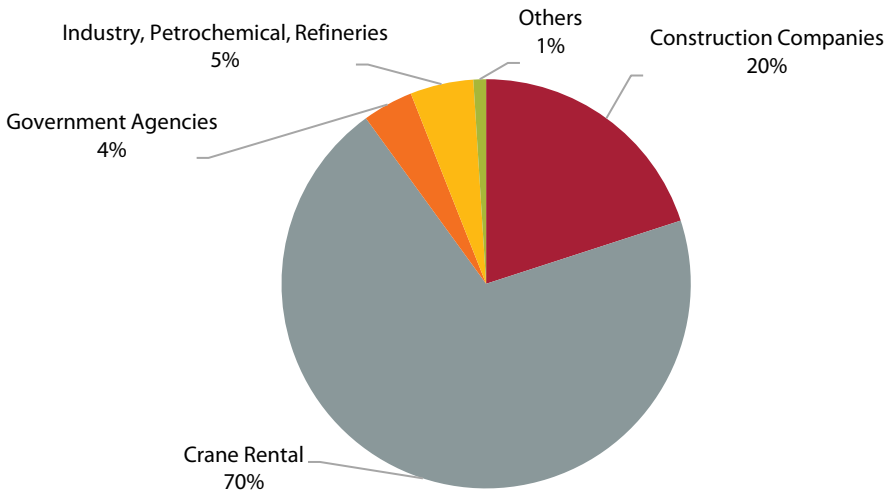
POPULATION AND END-USERS

Table 74. Thailand: Population of Mobile Cranes by End-User, 2014

Type	Units	%
Construction Companies	700	20
Crane Rental	2,450	70
Government Agencies	140	4
Industry, Petrochemical, Refineries	175	5
Others	35	1
Total	**3,500**	**100**

Source: Off-Highway Research

Chart 40. Thailand: Population of Mobile Cranes by End-User, 2014



Source: Off-Highway Research

No official statistics are available in Thailand to indicate the total population of mobile cranes. However, Off-Highway Research estimates that in total there are approximately 3,500 cranes working in the country, of which the rough terrain variety constitutes 50-60 per cent. The vast majority of these units are second-hand machines, which have been imported mainly from Japan, but also from Malaysia, Singapore and Taiwan.

Crane rental companies dominate the population and certainly have the highest number of usable cranes. The largest fleets are with market leaders such as TCJ Asia Co. Ltd, Big Crane, EK Crane, Thai Rent All and TSK. Crane hire companies are important in the construction industry in Thailand because many contractors are reluctant to commit themselves to large-scale investment in a crane when they may only require its use on a few occasions. By hiring, a contractor also has access to a wide variety of lifting capacities and can select the crane most appropriate to his needs.

In the public sector the biggest fleets belong to the Royal Irrigation Department, the Provincial Electricity authority (PEA), EGAT, the power generating authority, and the Royal Thai Army.

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FORECAST

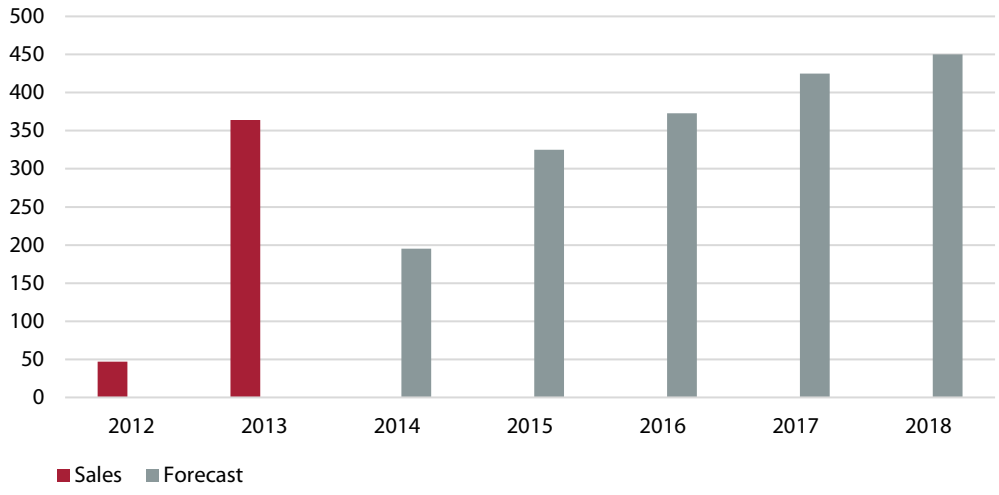
Demand will inevitably decline in the short term as business confidence stagnates against the backdrop of political turmoil currently engulfing the country. The cancellation and postponement of several major infrastructure projects have done little to encourage the crane hire companies to implement fleet replacement programmes during the first half of 2014 and suppliers are understandably reluctant to predict when the current malaise affecting the industry will be alleviated.

Table 75. Thailand: Forecast Sales of Mobile Cranes by Type, 2014-2018 (Units)

	2014	2015	2016	2017	2018
All Terrain	6	20	26	30	25
Crawler	4	10	15	17	20
Rough Terrain	35	65	52	68	90
Truck-Mounted	150	230	280	310	315
Total	**195**	**325**	**375**	**425**	**450**

Source: Off-Highway Research

Chart 41. Thailand: Forecast Sales of Mobile Cranes by Type, 2012-2018 (Units



Source: Off-Highway Research

Assuming a return to improved political stability in 2015 and in view of the military government's pledges to approve budget funds for long awaited mega-infrastructure projects, one might reasonably expect a significant improvement in demand for new mobile cranes in the period to 2018. The inauguration of the ASEAN Economic Community (AEC) in 2015 will compel Thailand to resolve its political differences in quick style if it is to attain its desire to become the central hub in the new trading organisation. The transportation links planned to neighbouring countries have the potential to stimulate significant demand for all types of construction and lifting equipment.

Used cranes will still fulfil most demand in the forecast period but there is more chance of buyers opting for new than there was in the first decade of the new millennium. Much of the growth is likely to be accounted for by the Chinese

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suppliers, the development of whose products should lead to increasing acceptance in the market.

MACHINES AVAILABLE

The table below shows the machines available through permanently represented companies. Suppliers who sell to international contractors and the government sector from bases outside Thailand are excluded. The engine horsepowers are quoted for the superstructure and the carrier in that order, linked by a + sign. Optional engines are shown after a / sign.

Table 76. Thailand: Mobile Cranes Available, 2014

Manufacturer / Type	Model	Max Lift Capacity (Tonnes)	HP	Manufacturer	Product Source
All Terrain	LTM 1030-2.1	35	278	Mercedes-Benz	Germany
Liebherr	LTM 1040-2.1	40	278	Mercedes-Benz	Germany
	LTM 1050-3.1	50	367	Liebherr	Germany
	LTC 1055-3.1	55	460	Liebherr	Germany
	LTM 1070-4.1	70	367	Liebherr	Germany
	LTM 1090-4.1	90	197+476	Liebherr	Germany
	LTM 1095-4.1	95	197+503	Liebherr	Germany
	LTM 1100-4.1	100	197+476	Liebherr	Germany
	LTM 1100-5.2	100	197+503	Liebherr	Germany
	LTM 1130-5.1	130	197+503	Liebherr	Germany
	LTM 1160-5.1	160	197+503	Liebherr	Germany
	LTM 1200-5.1	200	197+503	Liebherr	Germany
	LTM 1220-5.2	220	245+503	Liebherr	Germany
	LTM 1250-6.1	250	245+612	Liebherr	Germany
	LTM 1300-6.1	300	245+612	Liebherr	Germany
	LTM 1400-7.1	400	326+612	Liebherr	Germany
	LTM 1500-8.1	500	326+680	Liebherr	Germany
	LTM 11200-9.1	1,200	367+680	Liebherr	Germany
Tadano Faun	ATF60	60	123+354	Mercedes-Benz	Germany
	ATF80	70	123+394	Mercedes-Benz	Germany
	ATF110	110	177+517	Mercedes-Benz	Germany
	ATF160	160	184+517	Mercedes-Benz	Germany
	ATF220	220	188+530	Mercedes-Benz	Germany
Crawler Lattice	SCX300	30	147	Hino	Japan
Hitachi-	SCX400	40	147	Hino	Japan
Sumitomo	SCX500	50	177	Isuzu	Japan
	SCX550	55	177	Isuzu	Japan
	SCX700	70	177	Isuzu	Japan
	SCX800-2/HD	80	284	Mitsubishi	Japan
	SCX900/HD	90	247	Mitsubishi	Japan
	SCX1200-2	120	247	Mitsubishi	Japan
	SCX1500-2	150	247	Mitsubishi	Japan
	SCX2000	200	315	Mitsubishi	Japan
	SCX2500	250	315	Mitsubishi	Japan
	SCX2800-2	275	364	Mitsubishi	Japan
	SCX3500	300	405	Mitsubishi	Japan

Source: Company Information

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Table 75. Thailand: Mobile Cranes Available, 2014

Manufacturer/ Type	Model	Max Lift Capacity (Tonnes)	HP	Manufacturer	Product Source
Kobelco	CKE600	60	213	Hino	Japan
	CKE700	70	213	Hino	Japan
	CKE800	80	213	Hino	Japan
	CKE900	90	331	Hino	Japan
	CKE1100	110	331	Hino	Japan
	CKE1350	135	331	Hino	Japan
	CKE1800	180	331	Hino	Japan
	CKE2500	250	315	Mitsubishi	Japan
	SL4500	400	429	Hino	Japan
	SL6000	550	429	Hino	Japan
Liebherr	LR 1350/1	350	362	Liebherr	Germany
	LR 1400/2	400	402	Liebherr	Germany
	LR 1750	750	536	Liebherr	Germany
	LR 11250	1,000	870	Cummins	Germany
Sany	SCC800C	80	253	Cummins	China
	SCC1000C	100	249	Cummins	China
	SCC1500C	150	314	Cummins	China
	SCC2500C	250	335	Cummins	China
	SCC3200	320	405	Cummins	China
	SCC4000	400	518	Cummins	China
	SCC6300	630	544	Cummins	China
Zoomlion	QUY50	55	180	Weichai	China
	QUY70	70	238	Weichai	China
	QUY80	80	271	Weichai	China
Rough Terrain	RT540E	35	152	Cummins	USA
Grove	RT765-2E	60	210	Cummins	USA
Kato	SR-300L	30	268	Mitsubishi	Japan
	SR-700L	70	344	Mitsubishi	Japan
Tadano	GR-120NL	12	170	Mitsubishi	Japan
	GR-300EX	30	175	Cummins	Japan
	GR-700EXL	70	225	Mitsubishi	Japan
Terex	A300	30	143	Iveco	Italy
	A350	35	143	Iveco	Italy
	RC35	35	159	Cummins	Italy
	RC40	42	159	Cummins	Italy
	A400	35	151	Cummins	Italy
	A450	40	151	Cummins	Italy
	RC45	44	159	Cummins	Italy
	A600/C	60	205	Cummins	Italy
Truck-Mounted Kato	NK-550VR	55	350	Mitsubishi	Japan
Sany	QY25C	25	261	Shanghai	China
	QY50C	50	310	Cummins	China
	QY100	100	200+476	Mercedes	China
Tadano	TL-300E	30	275	Nissan	Japan
	GT 550	55	350	Nissan	Japan
XCMG	QY50K	50	280	Dongfeng	China
Zoomlion	QY25E431	25	271	Weichai	China
	QY50D531	50	336	Weichai	China
	QY70V533	70	376	Weichai	China

Source: Company Information

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MOTOR GRADERS

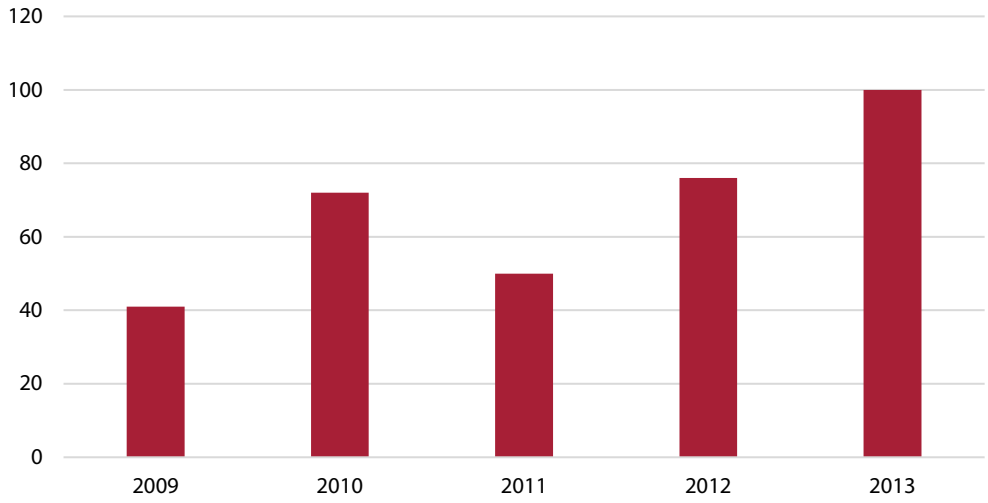
MARKET SIZE AND TRENDS

Table 77. Poland: Sales of Motor Graders 2016 (Units)

2009	2010	2011	2012	2013
41	72	50	76	100

Source: Off-Highway Research

Chart 42. Poland: Sales of Motor Graders 2016 (Units)



Source: Off-Highway Research

Motor graders follow very closely the trends of expenditure on new roads, infrastructure development and network maintenance. During the period of accelerated spending on the road network in the 1990s domestic sales of motor graders grew from 200 units in 1990 to nearly 450 in 1994.

The years since 1998 have been very poor for motor grader sales, until 2006. Since the Asian Financial Crisis, they have hardly existed at all in the private sector but have subsisted on modest purchases by the state sector. The population, however, has steadied since 1997, thanks to imports of second-hand machines, which have been around 120 units annually. Japan is the leading source for machines, with average shipments of 25 new and 75 used motor graders each year.

Sales of new motor graders moved between 25 and 40 units each year from 1999 to 2005. In 2006 public sector purchases were heavier than usual but also some mines bought machines and contractors bought machines for use in other countries. In 2010 the award of a government tender to Mitsubishi for 38 new graders precipitated a brief recovery in the market before the onset of widespread flooding in 2011 effectively halted demand for all construction equipment in the second half of that year. Increased public works investment and flood reconstruction projects in 2012 and 2013, however, saw volumes peak at 100 units last year.

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The most popular machines are in the 190 horsepower range, typified by the Caterpillar 140K and Volvo G940, and this class accounted for over 90 per cent of sales in 2013. Few of the largest graders are ever imported.

PRODUCTION

There is one producer, **Hidromek**, a leading manufacturer of construction machinery based in Ankara, Turkey. Hidromek acquired the motor grader business and manufacturing operations of MHI-Pornchai Machinery in November 2013. In 1993 Mitsubishi Heavy Industries (MHI) of Japan and Pornchai Equipment, a Bangkok based dealer in used construction equipment, formed a joint venture, MHI-Pornchai Machinery, to assemble motor graders in Thailand. The capital was THB30 million, divided between Pornchai Machinery (55 per cent) and MHI (45 per cent).

Under the terms of the agreement, Hidromek has purchased MHI's operations in motor graders including MHI's related technologies, design expertise and servicing operations as well as ownership of MHI-Pornchai Machinery Co. Ltd, the production base in Thailand that had manufactured MHI's products for markets in the Middle East and Southeast Asia. For its part, MHI will provide technical support and parts to Hidromek for another two years, as well as offer after-sale servicing support for customers in Japan. At the end of this period, Hidromek will take over these activities.

Following the 100 per cent buyout of shares by Hidromek, the company's name was changed in February 2014 to Hidromek Construction Equipment (Thailand) Ltd, abbreviated to HCE. The capital of the new company is THB170 million.

The old MHI-Pornchai plant on the Bangna-Trad Road, 20 kilometres south of Bangkok was closed in 2009 and production relocated to a new factory on the large Amata Nakorn Industrial Estate in Chonburi. The plant employs 165 people and encompasses an area of 4,467 m^2 on a total site area of 14,272 m^2. In May 2014 a second facility was opened some 2 kilometres from the existing plant specifically for the assembly of transmissions.

The Hidromek factory is a dedicated manufacturing operation as opposed to assembly only, and undertakes its own sheet metal cutting and fabrication, welding, machining and painting operations. In addition to graders it also manufactures and exports components for Mitsubishi reach stackers and produces sheet metal fabrications for Kawasaki's wheeled loader factory in Japan. The plant achieved ISO 9001 status in 2000 and ISO 14001 certification in 2004.

The plant assembles seven models of graders. The original 30 series comprises three models, the MG330 at 11 tonnes, MG430 at 12 tonnes and MG530 at 14 tonnes. Although the largest 210 horsepower MG730 model, designed specifically for

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Middle East markets, is listed in the product offering, no machines have yet been built. In Thailand the two smallest models are sold as the MG331 and MG431. All models feature powershift transmissions and Mitsubishi Stage IIIB engines.

Following the success of the 30 series, the range has been extended with the introduction of the more advanced high production 60 series graders for use on large construction sites. The 60 Series currently comprises one model, the MG460, which is fitted with Mitsubishi's high-capacity 6D24 engine rated at 185 horsepower. The machine also features an eight-speed direct drive planetary transmission, which provides gear ratios to suit all grading applications from heavy ripping to light maintenance.

Table 78. MHI-Pornchai/Hidromek: Production of Motor Graders, 2009-2013 (Units)

2009	2010	2011	2012	2013
51	121	212	118	127

Source: Off-Highway Research

During the beginning of the new millennium the plant struggled to produce more than 20 motor graders per year. In 2008 business finally improved as a result of growing demand in Indonesia and production rose to 72 units. Output peaked at over 200 units in 2011, bolstered once again by strong exports to Indonesia, and has subsequently reverted to 120-130 units per year.

All important components come from Japan, notably the engines, hydraulics and control systems. The plant makes frames and blades and undertakes all sheet metal fabrication and machining. Most steel is local but some special steels still have to come from Japan.

The domination of Caterpillar and influx of cheap Chinese imports has traditionally hindered sales of Mitsubishi graders in the Thai market and as a result around 95 per cent of production from the Chonburi plant is exported. By far the most important market remains Indonesia, which typically accounts for up to 65 per cent of overall production. Other significant markets include South Africa, India and the Philippines.

MARKET SHARES

Caterpillar is the perennial market leader and sells a significant volume of graders, which are sourced from its plant in China. In recent years, its powerful dealer, Metro Machinery, has also sold several 16M and 14M models to gold mines in neighbouring Laos, in addition to the Hongsa lignite mine and Xayaburi hydroelectric dam project in the same country.

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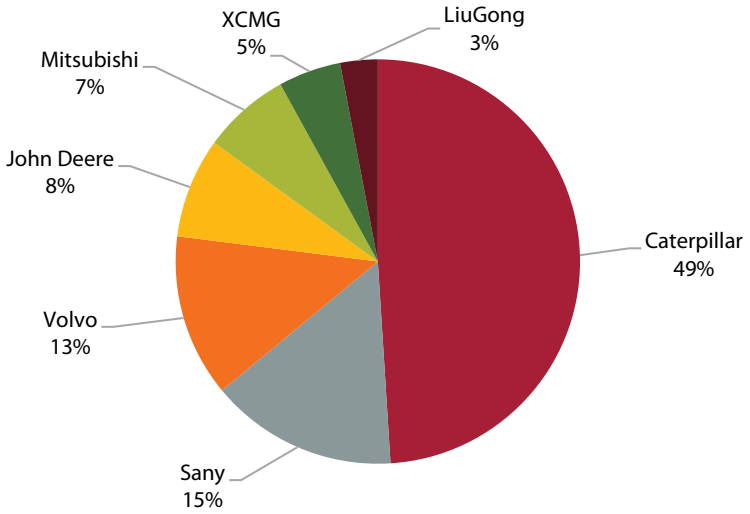
Table 79. Thailand: Suppliers of Motor Graders and Their Market Shares, 2012-2013

	2016		2013	
	Units	%		
Caterpillar	52	68	49	49
Sany	-	-	15	15
Volvo	3	4	13	13
John Deere	9	12	8	8
Mitsubishi	6	8	7	7
XCMG	2	3	5	5
LiuGong	4	5	3	3
Total	**76**	**100**	**100**	**100**

Source: Off-Highway Research

Chart 43. Thailand: Suppliers of Motor Graders and Their Market Shares, 2013



Source: Off-Highway Research

The entry of Chinese suppliers has been a notable feature of the market during the last five years. **Sany**, **LiuGong** and **XCMG** have all appointed independent dealers and each of them has sold small quantities of new graders during the period under review.

The other active suppliers are **Volvo**, **Hidromek**, **Komatsu** and **John Deere**, all of whose well-established dealers win business in the public sector through tenders to the provincial authorities, and in the private sector to specialist road building companies.

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Table 80. Thailand: Distribution Networks of Motor Graders, 2014

Manufacturer	Distributor
BEML	Paragon Machinery
Caterpillar	Metro Machinery
Hidromek	Hidromek Construction Eqpt. (Thailand)
John Deere	Hitachi Construction Machinery (Thailand)
Komatsu	Bangkok Komatsu Sales Co.
LiuGong	Yontrakarn
Mitsubishi	Pornchai Equipment
New Holland	Empire Tech Co.
Sany	Thaiyont
Volvo	Italthai Industrial
XCMG	OCR

Source: Company Information

POPULATION AND END-USERS

The grader is a long-lived machine and utilisation rates are relatively low. Off-Highway Research estimates that the population has probably declined to the level of 2,000 units, slightly below where it was before 1997. The public sector has sustained a population of about 1,000 units, working for the Department of Highways and the Royal Thai Army, while the private sector, which subcontracts work from clients such as the Royal Irrigation Department and the provincial road authorities, probably accounts for a further 1,000 units.

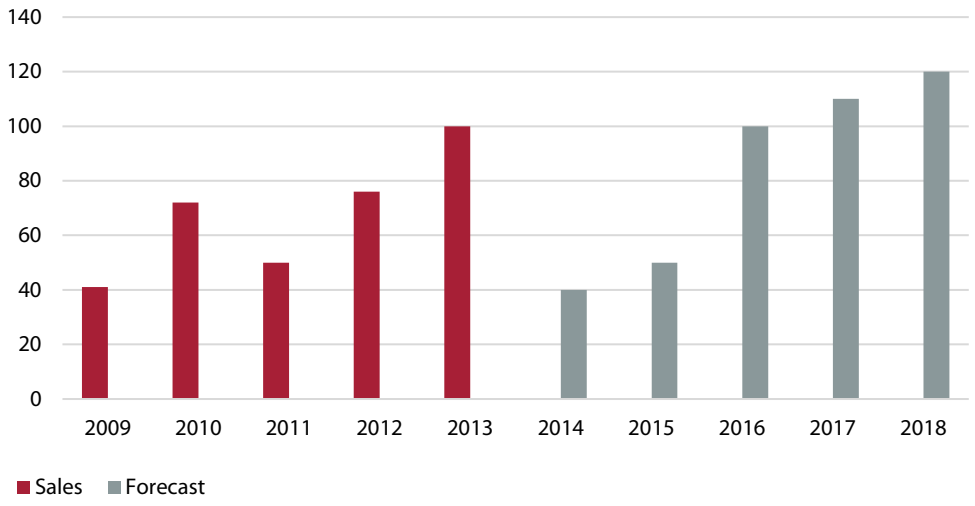
FORECAST

Table 81. Thailand: Forecast Sales of Motor Graders, 2014-2018 (Units)

2014	2015	2016	2017	2018
40	50	100	110	120

Source: Off-Highway Research

Chart 44. Thailand: Forecast Sales of Motor Graders, 2009-2018 (Units)



Source: Off-Highway Research

Demand from the private sector has historically been largely confined to used graders, although the advent of manufacturers' leasing schemes and availability of

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cheaper Chinese products mean that an increasing volume of new machines sales will be bought by the road building specialists and civil engineering contractors. The vast amount of infrastructure investment pledged by the military junta will initially be focused on transportation projects and include plans for up to 15,000 kilometres of four lane highway extensions and a significant volume of railway construction. The medium to long-term outlook for the grader sector therefore looks extremely promising and volumes are likely to stabilise at a level of 100-120 units per year towards the end of the forecast period.

MACHINES AVAILABLE

Table 82. Thailand: Motor Graders Available, 2014

Supplier	Model	Service Weight (Tonnes)	HP	Manufacturer	Product Source
Caterpillar	120K	12.0	145	Caterpillar	China
	12K	13.7	170	Caterpillar	China
	140K	14.1	190	Caterpillar	China
	160K	15.1	205	Caterpillar	China
John Deere	670G	14.5	108	John Deere	USA
	672G	15.3	165	John Deere	USA
	770G	14.8	165	John Deere	USA
	870G	15.8	180	John Deere	USA
Hidromek	MG330	10.9	135	Mitsubishi	Thailand
	MG 331	11.6	135	Mitsubishi	Thailand
	MG430	12.2	155	Mitsubishi	Thailand
	MG 431	13.8	155	Mitsubishi	Thailand
	MG460	15.3	185	Mitsubishi	Thailand
	MG 530	16.8	185	Mitsubishi	Thailand
Komatsu	GD511A-1	10.8	135	Komatsu	Japan
	GD611A-1	12.5	155	Komatsu	Japan
	GD661A-1	13.3	180	Komatsu	Japan
	GD655-3A	14.1	190	Komatsu	Japan
Sany	SHG 190	15.3	201	Deutz	China
	SMG 200	16.9	195	Cummins	China
Volvo	G930	15.6	155	Volvo	Canada
	G940	16.0	175	Volvo	Canada
	G960	16.7	195	Volvo	Canada
	G970	17.7	210	Volvo	Canada
XCMG	GR165	15.0	170	Shanghai Diesel	China
	GR180	15.4	188	Shanghai Diesel	China
	GR200	16.0	200	Shanghai Diesel	China

Source: Company Information

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ROUGH TERRAIN LIFT-TRUCKS

MARKET SIZE AND TRENDS

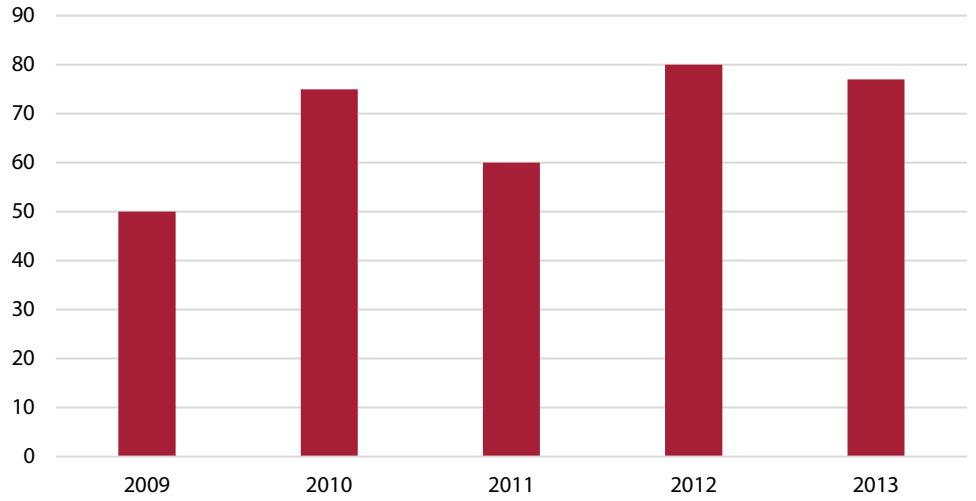
The telescopic rough terrain lift truck is not a product that has reached an established degree of popularity yet. The use of forklift trucks in industry is largely confined to traditional industrial types, and in the construction sector telehandlers face stiff competition from the multitude of rough terrain cranes imported as used machines from Japan

Table 83. Thailand: Sales of Rough Terrain Lift Trucks, 2009-2013 (Units)

2009	2010	2011	2012	2013
50	75	60	80	77

Source: Off-Highway Research

Chart 45. Thailand: Sales of Rough Terrain Lift Trucks, 2009-2013 (Units)



Source: Off-Highway Research

In construction, there is a shortage of suitable applications. Housing is a prime example and the high-rise block construction method in Thailand does not readily lend itself to the use of telehandlers as it does in the two-storey suburban developments in the UK, France or North America.

The alternatives, which are also in use in the much larger industrial construction sector, are the cheap, small tower crane for on-site handling and crude electric lifts for the bringing of materials to the desired height. It is also still very common to see manual labour being used where the telescopic type of handler would be used in Europe and North America, e.g. to carry tiles to a roofer working on a house.

Despite the negative factors influencing demand for telescopic handlers, the French manufacturer Manitou has worked tirelessly to promote the concept since introducing its products to the Thai market in 1999. The company has successfully established itself as a niche supplier and has delivered telehandlers to a wide variety of applications, including recycling, agriculture, oil palm plantations, oil and gas

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installations, construction, industrial, hydro power plants and wind farm projects. Masted rough terrain forklifts have also been sold to users in the construction sector and oil palm industry.

PRODUCTION

No local production.

MARKET SHARES

The telescopic handler market is dominated by just one supplier, **Manitou**, which introduced the concept in Thailand in 1999. The French manufacturer services the market through its Bangkok based dealer Promech Resources, which is supported by the Manitou Asia subsidiary company in Singapore. Promech markets the full Manitou product line, which in addition to telescopic handlers includes rough terrain masted lift trucks and aerial work platforms. It also operates a large rental fleet of Manitou machines and is also the official Manitou dealer in Myanmar and Laos.

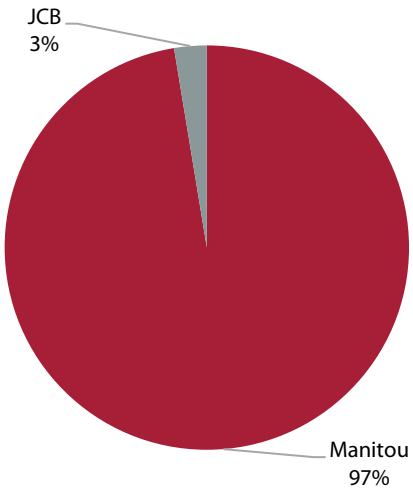
JCB is the only other active supplier, although it has only sold an incremental number of units in recent years.

Table 84. Thailand: Suppliers of Rough Terrain Lift Trucks and Their Market Shares, 2012-2013

	2012		2013	
	Units	%	Units	%
Manitou	80	100	75	97
JCB	-	-	2	3
Total	**80**	**100**	**77**	**100**

Source: Off-Highway Research

Chart 46. Thailand: Suppliers of Rough Terrain Lift Trucks and Their Market Shares, 2013



Source: Off-Highway Research

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Table 85. Thailand: Distribution Networks of Rough Terrain Lift Trucks, 2014

Manufacturer	Distributor
JCB	Siam Motor Parts
Manitou	Promech Resources

Source: Company Information

POPULATION AND END-USERS

The population is estimated at 750 units, in construction, agriculture and industry. Telehandlers are also found in the oil palm plantations, in oil and gas installations, wind farm projects and hydropower projects. Masted rough terrain lift trucks are primarily used in the oil palm industry and construction applications.

FORECAST

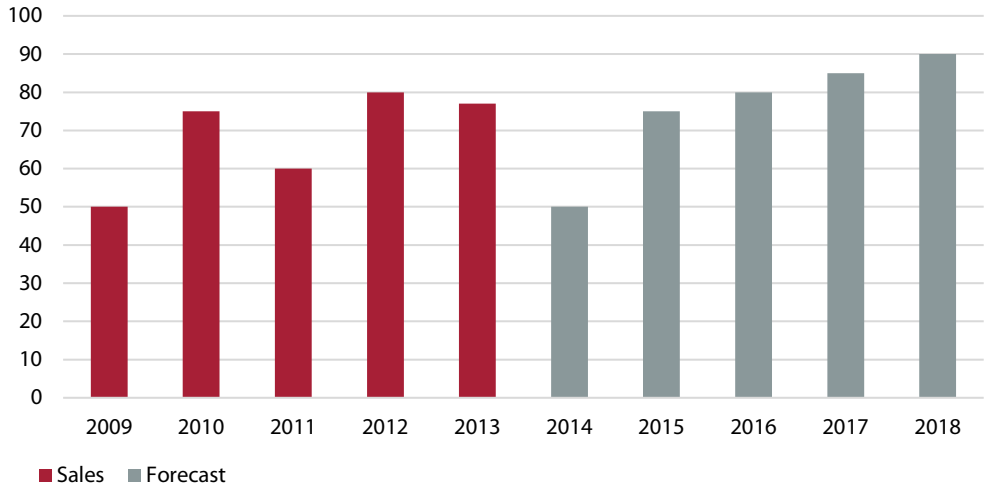
The outlook for the short term will inevitably be affected by the political crisis, although demand should recover towards the end of the forecast period as business confidence returns and fleet replacement programmes are initiated.

Table 86. Thailand: Forecast Sales of Rough Terrain Lift Trucks, 2014-2018 (Units)

2014	2015	2016	2017	2018
50	75	80	85	90

Source: Off-Highway Research

Chart 47. Thailand: Forecast Sales of Rough Terrain Lift Trucks, 2009-2018 (Units)



Source: Off-Highway Research

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MACHINES AVAILABLE

Table 87. Thailand: Rough Terrain Lift Trucks Available, 2014

Manufacturer	Model	HP	Manufacturer	Operating Capacity (Metres)	Maximum Lift (Metres)	Product Source
JCB	520-50	77	Perkins	2.0	5.0	UK
	525-50	77	Perkins	2.5	5.0	UK
	526	82	JCB	2.6	5.0	UK
	528-70	82	JCB	2.8	6.8	UK
	530-70	82	JCB	3.0	6.8	UK
	540-70	102	JCB	4.0	6.8	UK
	535-140	100-121	JCB	3.5	14.0	UK
	535-95	100	JCB	3.5	9.5	UK
	533-105	121	JCB	3.3	10.5	UK
	535-125	121	JCB	3.5	12.5	UK
	540-140	121	JCB	4.0	14.0	UK
	540-170	102	JCB	4.0	16.7	UK
Manitou	MT625	75	Kubota	2.5	5.9	France
	MT732	95	Perkins	3.2	6.9	France
	MT932	95	Perkins	3.2	9.0	France
	MT1030ST	100	Perkins	3.0	10.0	France
	MT1235ST	100	Perkins	3.5	12.0	France
	MT1435HSL	100	Perkins	3.5	13.0	France
	MT1440	100	Perkins	4.0	13.5	France
	MT1840	100	Perkins	4.0	17.5	France
	MRT-X1440	101	Perkins	4.0	13.8	Italy
	MRT-X1640	101	Perkins	4.0	15.8	Italy
	MRT-X1840	150	Perkins	4.0	17.9	Italy
	MRT-X2150	150	Mercedes-Benz	5.0	20.6	Italy
	MRT-X2540	150	Mercedes-Benz	4.0	24.6	Italy
	MRT-X3050	216	Mercedes-Benz	5.0	29.6	Italy

Source: Company Information

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SKID-STEER LOADERS

MARKET SIZE AND TRENDS

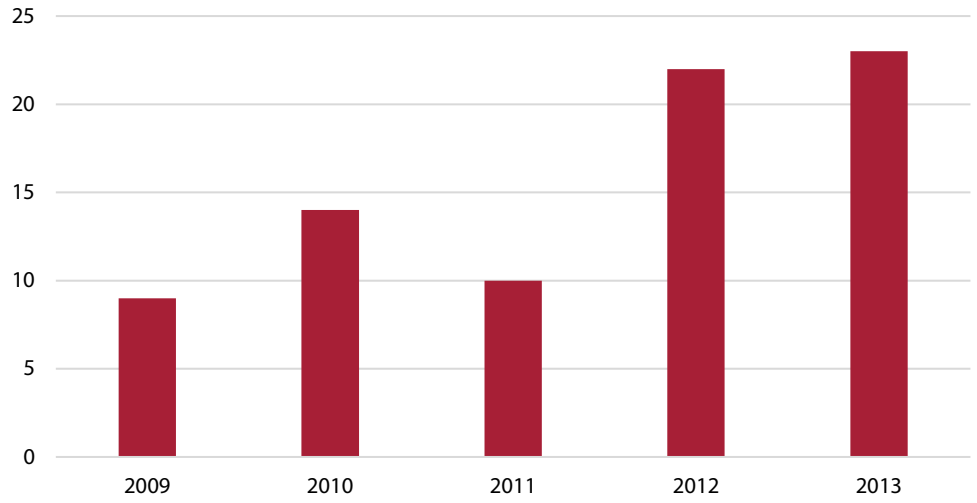
Skid-steer loaders have made very little headway, with most of the potential applications being fulfilled instead by cheap manual labour. Sales did not really begin until the 1990s, with pioneer purchases by sugar mills, construction companies and a few enterprising rental companies. By 1995 and 1996 the market had grown to 65 units but collapsed after 1997. After a small recovery in 2000 resulting from a government tender, sales fell back again to negligible levels.

Table 88. Thailand: Sales of Skid-Steer Loaders, 2009-2013 (Units)

2009	2010	2011	2012	2013
9	14	10	22	23

Source: Off-Highway Research

Chart 48. Thailand: Sales of Skid-Steer Loaders, 2009-2013 (Units)



Source: Off-Highway Research

The alternative for potential users interested in mechanised as opposed to manual work, is the compact wheeled loader with a hydrostatic transmission, imported as a used machine from Japan. In past years up to 2,000 used loaders were exported from Japan in a single year, although declining availability and rising prices have reduced this volume significantly.

The few skid-steer loaders that do come into Thailand as totally new units have capacities from 750 to 900 kilograms, with the latter size being slightly more prominent.

PRODUCTION

No local production.

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MARKET SHARES

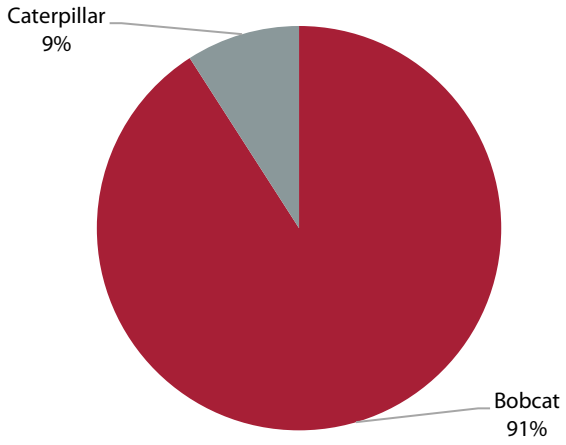
Few companies actively market skid-steer loaders, although several offer them in their programmes. The leading supplier is **Bobcat**, sold for many years by the Italthai Industrial company, which was historically one of the strongest Ingersoll-Rand dealers in Asia. Other companies, which have sold incremental units in recent years, include **Caterpillar**, **JCB**, **Case**, **Hyundai** and **John Deere**.

Table 89. Thailand: Suppliers of Skid-Steer Loaders and Their Market Shares, 2012-2013

	2012		2013	
	Units	%	Units	%
Bobcat	20	91	20	87
Caterpillar	2	9	3	13
Total	**22**	**100**	**23**	**100**

Source: Off-Highway Research

Chart 49. Thailand: Suppliers of Skid-Steer Loaders and Their Market Shares, 2013



Source: Off-Highway Research

Very few dealers are interested to sell skid-steer loaders. The full list of suppliers is shown below. Details of dealer networks are in the Company Profiles.

Table 90. Thailand: Distribution Networks of Skid-Steer Loaders, 2014

Manufacturer	Distributor
Bobcat	Italthai Industrial
Caterpillar	Metro Machinery
Gehl	Promech Resources
Hyundai	AVN Motor Works
JCB	Siam Motor Parts

Source: Company Information

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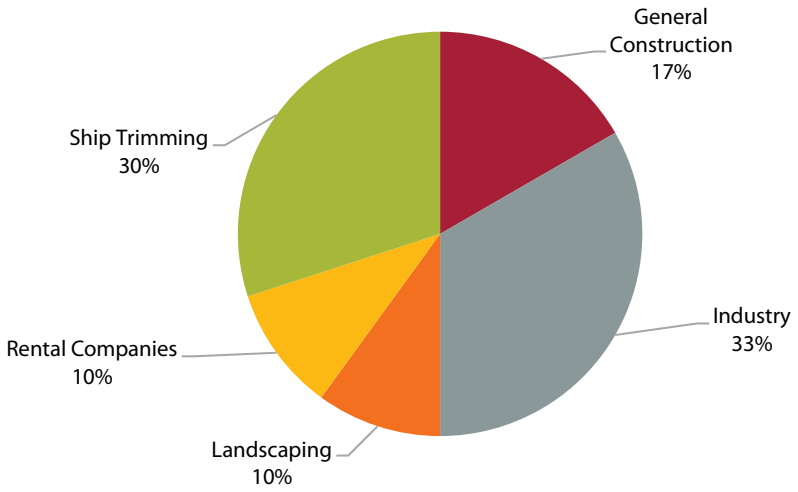
POPULATION AND END-USERS

Table 91. Thailand: Population of Skid-Steer Loaders by Type of User, 2014

	Units	%
General Construction	50	17
Industry	100	33
Landscaping	30	10
Rental Companies	30	10
Ship Trimming	90	30
Total	**300**	**100**

Source: Off-Highway Research

Chart 50. Thailand: Population of Skid-Steer Loaders by Type of User, 2014



Source: Off-Highway Research

In the early 1990s it appeared that the construction industry might take up the skid-steer loader, as a tool for small constructors or as an item occasionally rented to them. That has simply not happened, because the flow of cheap manual labour from the countryside to the towns is so vast. The skid-steer loader concept has therefore stimulated no interest from Thai contractors, and the bulk of new machine sales are made to foreign companies operating in Thailand. Similarly, the product has generated no interest from the agricultural sector, for whom the concept is prohibitively expensive.

Recent sales have been to sugar mills and palm oil processors who already have fork lift trucks and other handling machines to use, while the expanding volume of trade in the ports has fostered some interest in using larger skid-steer loaders for ship trimming. The existing machines in construction can infrequently be seen working on housing sites or in landscaping.

FORECAST

Japan and China do not export many used skid-steer loaders to Thailand, which has the effect of removing the possibility of buying a cheap used machine as a first experiment with the skid-steer loader concept. The forecast therefore assumes that

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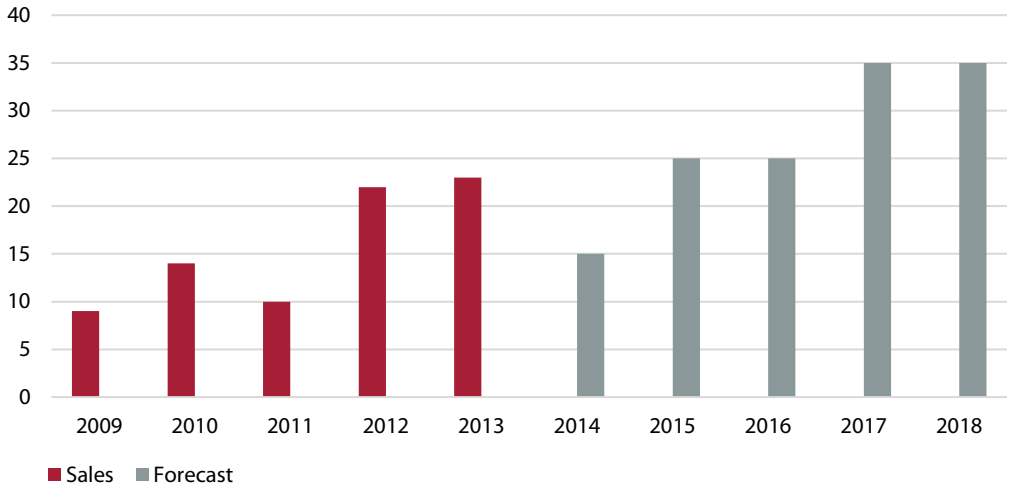
it will be the industrial applications that will continue to form the bulk of demand and that those needs will be fairly small.

Table 92. Thailand: Forecast Sales of Skid-Steer Loaders, 2014-2018 (Units)

2014	2015	2016	2017	2018
15	25	25	35	35

Source: Off-Highway Research

Chart 51. Thailand: Forecast Sales of Skid-Steer Loaders, 2009-2018 (Units)



Source: Off-Highway Research

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MACHINES AVAILABLE

Table 93. Thailand: Skid-Steer Loaders Available, 2014

Manufacturer	Model	HP	Manufacturer	Operating Weight (Kg)	Product Source
Bobcat	463	23	Kubota	318	Czech Republic
	553	25	Kubota	431	Czech Republic
	S130	46	Kubota	590	Czech Republic
	S150	46	Kubota	680	USA
	S160	56	Kubota	725	USA
	S175	46	Kubota	795	USA
	S185	56	Kubota	839	USA
	S205	61	Kubota	930	USA
	S220	75	Kubota	998	USA
	S250	75	Kubota	1,134	USA
	S300	81	Kubota	1,361	USA
Caterpillar	216B	50	Caterpillar	635	USA
	226B	57	Caterpillar	680	USA
	236B	71	Caterpillar	793	USA
	246B	77	Caterpillar	907	USA
JCB	135	48	Perkins	612	UK
	155	60	Perkins	703	UK
	175	60	Perkins	794	UK
	190	60	Perkins	862	UK
	205	60	Perkins	930	UK
	225	60	Perkins	1,021	UK

Source: Company Information

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WHEELED LOADERS

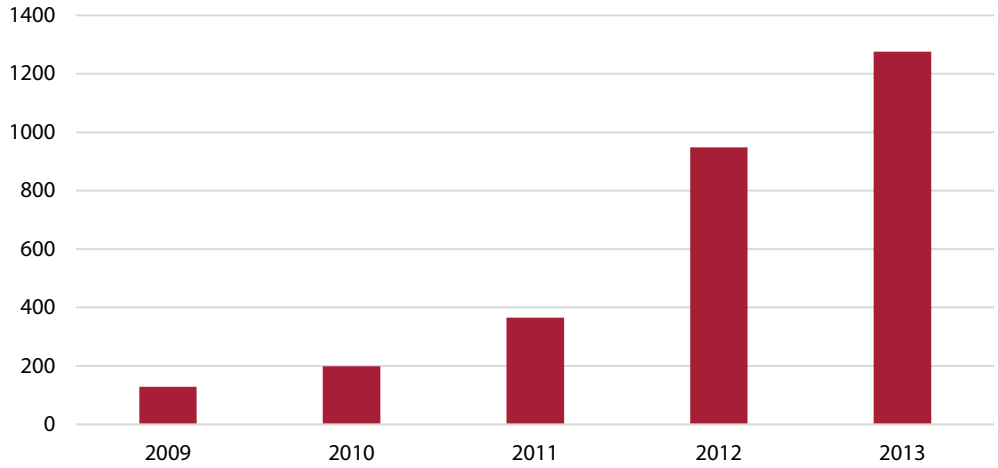
MARKET SIZE AND TRENDS

Table 94. Thailand: Sales of Wheeled Loaders, 2009-2013 (Units)

2009	2010	2011	2012	2013
129	199	365	948	1,276

Source: Off-Highway Research

Chart 52. Thailand: Sales of Wheeled Loaders, 2009-2013 (Units)



Source: Off-Highway Research

In comparison to other global markets, wheeled loaders in Thailand have historically played a minor role in construction, civil engineering, materials handling and industry. In the 1990s wheeled loader sales rose to levels between 500 and 600 units annually, although shipments slumped to almost nothing in the immediate aftermath of the Asian financial crisis in 1997. Demand during the first decade of the new millennium recovered moderately but rarely exceeded 100 units per year. Improving economic conditions and buoyant growth in the construction sector in 2010 and the first half of 2011, however, saw sales rise to 365 units, their highest level for 14 years.

In 2012, the market embarked on a phase of unprecedented and unforeseen growth as the government implemented widespread flood reconstruction projects in the wake of the devastating floods, which inundated much of the country from July 2011 to January 2012. Demand was further stimulated by the government's rice pledging scheme, which aimed to inflate the price of Thai rice on global export markets, although subsequently failed spectacularly, with the government owing billions of baht to unpaid farmers. The initial effect of the scheme, however, was to encourage many of the country's rice handling mills to invest heavily in new wheeled loaders in anticipation of growing profits. The spike in demand continued into 2013 when sales reached nearly 1,300 units.

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The wheeled loader's historical lack of success, if one disregards the extraordinary developments of 2012 and 2013, is primarily due to the fact that the crawler excavator is chosen as the alternative for moving large volumes of material, and manual labour for small amounts. Poor as its mobility is, the excavator on tracks is commonly used in construction and civil engineering for moving materials around the site. Compact wheeled loaders with 1.0 m^3 buckets generate a meagre sales volume simply because manual labour is cheaper.

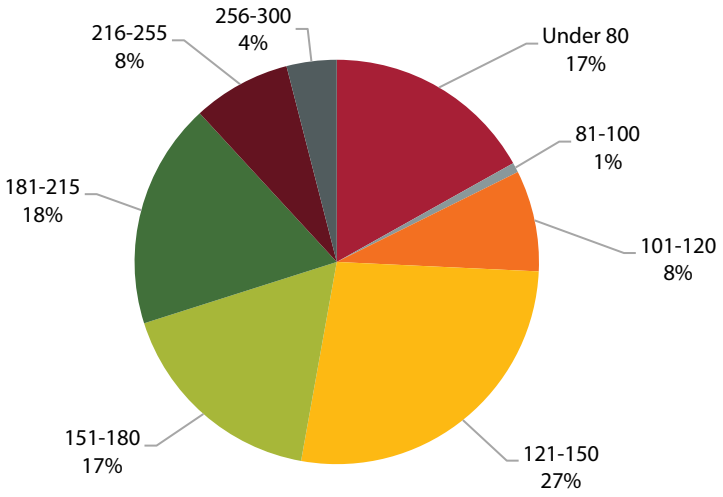
The bulk of demand, typically 60-70 per cent, for wheeled loaders falls within the 120-220 horsepower categories. A small quantity of small hydrostatic units are sold for use in industry with buckets of about 1.0 m^3. However, multipurpose units with a 1.5 m^3 bucket are the preferred option for handling sand or the two valuable agricultural crops, rice and cassava. In addition to crop handling applications, machines from 150 to 250 horsepower are used in general construction and, in the case of loaders above 200 horsepower, in the quarry sector.

Table 95. Thailand: Sales of Wheeled Loaders by Horsepower, 2012-2013

	2012		2013	
Horsepower	Units	%	Units	%
Under 80	95	10	215	17
81-100	9	1	10	-
101-120	75	8	103	8
121-150	218	23	345	27
151-180	200	21	220	17
181-215	265	28	230	18
216-255	57	6	100	8
256-300	28	3	51	4
301-400	-	-	1	-
Above 400	1	-	1	-
Total	**948**	**100**	**1,276**	**100**

Source: Off-Highway Research

Chart 53. Thailand: Sales of Wheeled Loaders by Horsepower, 2013



Source: Off-Highway Research

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Thailand was the first country to exploit the industrial prospects of cassava on a large scale. Since the 1970s it has exported enormous quantities of dried cassava chips and pellets to the countries of the European Union, which uses them in animal feed. More recently, the private sector in Thailand has created new cassava markets by exploiting the crop's potential as a source of cheap starch. About 50 per cent of the country's cassava now goes to starch production.

Used wheeled loaders are much less popular than used excavators and do not sell in large quantities, due primarily to the fact that many users now prefer the option of buying a new Chinese machine for a similar price to an imported used machine from Japan.

PRODUCTION

No local production.

MARKET SHARES

Table 96. Thailand: Suppliers of Wheeled Loaders and Their Market Shares, 2012-2013

	2012		2013	
	Units	%	Units	%
LiuGong	250	26	349	27
XCMG	280	29	340	27
Xiagong	73	8	120	9
SEM	66	7	105	8
SDLG	23	2	62	5
Caterpillar	62	6	60	5
Kawasaki	50	5	50	4
Komatsu	33	3	48	4
Lishide	20	2	35	3
Hyundai	22	2	26	2
Hitachi	19	2	17	1
Doosan	15	2	17	1
Changlin	10	1	16	1
Foton Lovol	15	2	15	1
Volvo	10	1	8	1
Shantui	-	-	4	-
Longking	-	-	2	-
John Deere	-	-	2	-
Total	**948**	**100**	**1,276**	**100**

Source: Off-Highway Research

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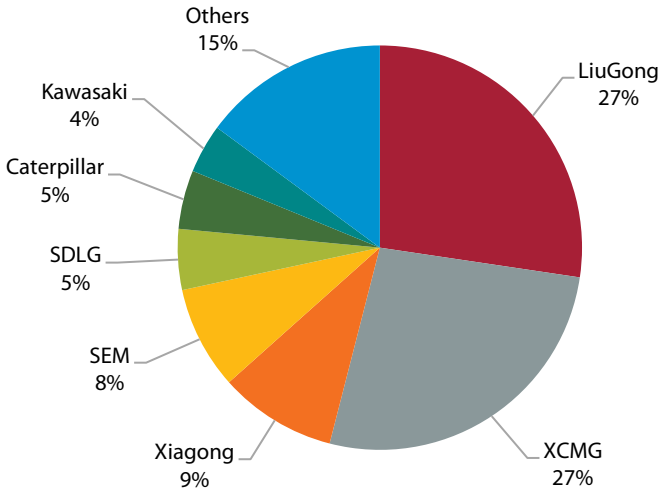
Chart 54. Thailand: Suppliers of Wheeled Loaders and Their Market Shares, 2013



Source: Off-Highway Research

As in all Southeast Asian countries, the wheeled loader market is dominated by the Chinese manufacturers, around 10 of whom actively market their products in Thailand. The sector is highly price sensitive, and the Chinese manufacturers' ability to offer machines at 50-60 per cent below the price of the equivalent Western or Japanese brands means that today they control over 80 per cent of the market in unit terms.

Whilst it is generally accepted that the technical sophistication of Chinese built products is below that of the established brands, there is no doubt that their quality has improved immeasurably in recent years, largely as a result of the incorporation of internationally sourced components. Furthermore, many of the applications in which wheeled loaders are used in Thailand are relatively non-arduous, and many users are happy to forgo some of the advanced features found on more expensive machines in favour of lower initial purchase costs.

LiuGong and **XCMG** are the two leading suppliers, and during the last two years have benefited enormously from widespread investment in wheeled loaders by the rice handling mills. Chinese suppliers also occupy the next three positions in the market. **Xiagong** (XGMA) and **SEM** have each sell a similar volume of new machines, whilst **SDLG**, marketed by the Volvo importer, Italthai Industrial, increased its presence in the sector significantly in 2013.

Of the remaining suppliers, **Caterpillar**, **Kawasaki** and **Komatsu** account for the largest volume of sales and attract a loyal customer base who are prepared to pay a premium for more technologically advanced products. Caterpillar and Komatsu are also the two leading suppliers of high horsepower wheeled loaders to the mining sector, where the issue of price competition is less intense, and in recent years have delivered machines up to 800 horsepower.

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The full list of suppliers is shown below. Details of dealer networks are in the Company Profiles.

Table 97. Thailand: Distribution Networks of Wheeled Loaders, 2014

Manufacturer	Distributor
Caterpillar	Metro Machinery
Chenggong	Ariya Equipment
Doosan	DKSH (Thailand)
Foton Lovol	Paragon Machinery
Hitachi	Hitachi Construction Machinery (Thailand)
Hyundai	AVN Motor Works
JCB	Siam Motor Parts
John Deere	Hitachi Construction Machinery (Thailand)
Kawasaki	Krung Thai Tractor
Komatsu	Bangkok Komatsu Sales Co.
Liebherr	Paragon Machinery
Lishide	SA Tractor
LiuGong	Yontrakarn Machinery
SDLG	Italthai Industrial
SEM	MTS
Volvo	Italthai Industrial
XCMG	OCR
Xiagong	Siam Sun Auto

Source: Company Information

POPULATION AND END-USERS

Table 98. Thailand: Population of Wheeled Loaders by Type of User, 2014 (Horsepower)

	Units	%
Agriculture	1,550	31
Construction		
– Civil Engineering	1,050	21
– General	450	9
– Road Authorities	150	3
– Water Resources/Irrigation (State)	300	6
Industry (Not Feed/Food)	600	12
Quarries and Mines	750	15
Rental Companies	150	3
Total	**5,000**	**100**

Source: Off-Highway Research

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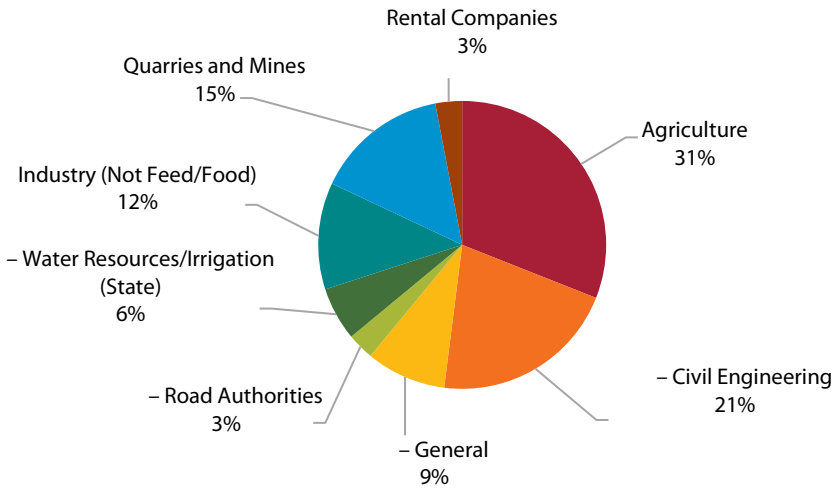
Chart 55. Thailand: Population of Wheeled Loaders by Type of User, 2014 (Horsepower)



Source: Off-Highway Research

Although wheeled loaders are engaged in all aspects of the construction industry and crop handling mills, the variety of applications in which they are used remains relatively limited in Thailand compared to developed global markets. Many potential users avoid the loader, preferring to use alternative products, the most obvious of which is the quarry sector where hydraulic excavators are employed to move stone that elsewhere would be in the bucket of a 150 horsepower loading shovel. In addition, the availability of cheap manual labour means that compact wheeled loaders are rarely seen in materials handling applications.

FORECAST

Table 99. Thailand: Forecast Sales of Wheeled Loaders, 2014-2018 (Units)

2014	2015	2016	2017	2018
500	500	600	650	700

Source: Off-Highway Research

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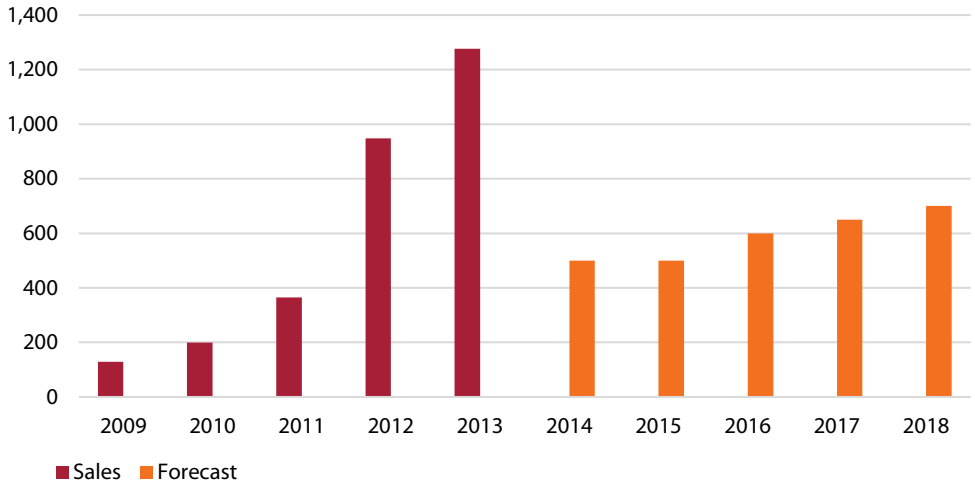
Chart 56. Thailand: Forecast Sales of Wheeled Loaders, 2014-2018 (Units)



Source: Off-Highway Research

The prospects of renewed political stability, sustained economic growth and government pledges of significant investment in infrastructure projects suggest a buoyant outlook for the construction equipment sector. Demand for wheeled loaders in the next two years, however, is likely to contract significantly as a result of the poor investment climate and the cancellation of the government's ill-conceived rice subsidy scheme. The fleet replacement programmes of the crop handling mills should nevertheless sustain a healthy level of new sales in the medium to long term at least.

MACHINES AVAILABLE

The table below shows the machines available through permanently represented companies. Suppliers may sell less than the complete range offered by the manufacturers.

Table 100. Thailand: Wheeled Loaders Available, 2014

Manufacturer	Model	HP	Manufacturer	Product Source
Caterpillar	904B	52	Caterpillar	UK
	906	61	Caterpillar	UK
	908	84	Caterpillar	UK
	914G	95	Caterpillar	UK
	924G	114	Caterpillar	UK
	928G	125	Caterpillar	UK
	930G	150	Caterpillar	UK
	938K	168	Caterpillar	USA
	950K	200	Caterpillar	China
	962K	215	Caterpillar	China
	966K	265	Caterpillar	China
	972H	291	Caterpillar	China
	980H	322	Caterpillar	China
	988H	481	Caterpillar	USA
	990H	636	Caterpillar	USA
	992G	880	Caterpillar	USA
	994F	1,600	Caterpillar	USA

Source: Company Information

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Table 101. Thailand: Wheeled Loaders Available, 2014 (continued)

Manufacturer	Model	HP	Manufacturer	Product Source
Chenggong	ZL30B-II	112	Wuxi	China
	CG932H	125	Wuxi	China
	CG946C	174	Wuxi	China
	ZL50E-3	220	Weichai	China
	CG966H	283	Cummins	China
Doosan	DL 200	139	Weichai	China
	DL 220	143	Weichai	China
	DL 250	155	Weichai	China
	DL 300	230	Weichai	China
	DL 350	221	Weichai	China
	DL 400	284	Weichai	China
	DL 450	305	Weichai	China
	DL 500	340	Weichai	China
Foton Lovol	FL920F	80	Luoyang	China
	FL935E	125	Yuchai	China
	FL953F-II	220	Weichai	China
	FL966F	237	Weichai	China

Source: Company Information

Table 99. Thailand: Wheeled Loaders Available, 2014 (Continued)

Manufacturer	Model	HP	Manufacturer	Product Source
Hitachi	ZW80	61	Kubota	Japan
	ZW90	71	Kubota	Japan
	ZW100-G	83	Kubota	Japan
	ZW120-G	91	Kubota	Japan
	ZW140	130	Cummins	Japan
	ZW150	144	Cummins	Japan
	ZW180	172	Cummins	Japan
	ZW220	220	Isuzu	Japan
	ZW250	240	Isuzu	Japan
	ZW310	295	Mercedes-Benz	Japan
Hyundai	HL730-9	125	Cummins	Korea
	HL740-9	147	Cummins	Korea
	HL757-9	197	Cummins	Korea
	HL760-9	219	Cummins	Korea
	HL770-9	284	Cummins	Korea
	HL780-9	353	Cummins	Korea
John Deere	744K	305	John Deere	USA
	824K	333	John Deere	USA
	844K	380	John Deere	USA
Kawasaki	50 ZV	96	Cummins	Japan
	60 ZV-2	122	Cummins	Japan
	65 ZV-2	149	Cummins	Japan
	70 ZV-2	174	Cummins	Japan
	80 ZV-2	193	Cummins	Japan
	85 ZV-2	224	Cummins	Japan
	90 ZV-2	271	Cummins	Japan
	92 ZV-2	284	Cummins	Japan
	95 ZV-2	348	Cummins	Japan
	115 ZV-2	463	Cummins	Japan
Komatsu	WA120-3	85	Komatsu	Japan
	WA200-3	110	Komatsu	Thailand
	WA320-3	163	Komatsu	Thailand
	WA380-3	187	Komatsu	Thailand
	WA470-5	261	Komatsu	Japan
	WA500-3	320	Komatsu	Japan
LiuGong	CLG816	63	Yanmar	China
	CLG835	123	Cummins	China
	CLG842	165	Cummins	China
	CLG856	215	Cummins	China

Source: Company Information

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Table 99. Thailand: Wheeled Loaders Available, 2014 (Continued)

Manufacturer	Model	HP	Manufacturer	Product Source
LiuGong cont'd	CLG862	240	Cummins	China
	CLG888	310	Cummins	China
SDLG	LG918	80	Yuchai	China
	LG936L	105	Yuchai	China
	LG938	135	Yuchai	China
	LG958	200	Yuchai	China
	LG968	240	Yuchai	China
SEM	SEM616B	75	Wuxi	China
	SEM639B	125	Weichai	China
	SEM650B	220	Weichai	China
	SEM659C	220	Shanghai	China
Volvo	L60E	140	Volvo	Sweden
	L60F	156	Volvo	Sweden

Source: Company Information

Table 99. Thailand: Wheeled Loaders Available, 2014

Manufacturer	Model	HP	Manufacturer	Product Source
Volvo (Continued)	L70F	170	Volvo	Sweden
	L90F	174	Volvo	Sweden
	L110E	210	Volvo	Sweden
	L120E	224	Volvo	Sweden
	L150E	272	Volvo	Sweden
	L180E	303	Volvo	Sweden
	L220E	352	Volvo	Sweden
	L350F	535	Volvo	Canada
XCMG	LW300F	125	Yuchai	China
	LW400K	170	Shanghai, Cummins	China
	LW500F	220	Weichai, Cummins	China
Xiagong	XG918	82	Cummins	China
	XG932III	125	Yuchai	China
	XG958	220	Shanghai	China

Source: Company Information

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MANUFACTURER PROFILES

In 2014 there are four manufacturers producing construction equipment profiled in this report:

- Bangkok Komatsu Co. Ltd – crawler excavators, wheeled loaders.
- Caterpillar (Thailand) Limited – crawler dozers.
- Hidromek Construction Equipment (Thailand) Ltd. – motor graders.
- Thai Kobelco Construction Machinery Ltd. – crawler excavators.

Since Off-Highway Research's last report in 2011 both Komatsu and Kobelco have expanded their production capacity significantly in response to buoyant growth in the markets of Southeast Asia, in particular Indonesia. In 2013 Mitsubishi Heavy Industries sold its motor grader manufacturing operation in Chonburi to Turkish manufacturer Hidromek, whilst Caterpillar inaugurated a new facility in Rayong for medium sized crawler dozers.

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BANGKOK KOMATSU

Address	**Bangkok Komatsu Co. Ltd** Amata Nakorn Industrial Estate 700/21 Moo 5 Bangna-Trad Road A. Muang Chonburi 20000
Telephone	+66 (0)3821 4780-6
Website	www.bkc.co.th
Key Personnel	Phornthep Phornprapha, Chairman Somsak Techacheewapong, President
Employees	570

Source: Company Information

HISTORY

The venture to produce Komatsu hydraulic excavators in Thailand was formed in 1995, with a capital of Bt620 million, approximately $25 million at the time. Komatsu held 74.84 per cent of the equity and Bangkok Motor Works, the local importer, the rest. The investment cost THB1,050 million and the plan at the time was to build up to a production level of 3,500 excavators per year. An initial workforce of 150 people was recruited.

With the collapse of the local and regional market in 1997 to 1999 the company had to find other markets. The PC200 was made suitable in specification for international sales and shipments to the USA began in 1998. Although the volume of excavators sold in Thailand has grown significantly since 2003, much of the recent rapid growth of Bangkok Komatsu has come from buoyant demand in export markets, in particular Indonesia.

MANUFACTURING FACILITIES

The plant is located in the modern Amata Nakorn industrial zone in Chonburi, 57 kilometres south of Bangkok. The site covers 81,000 m^2 and has production buildings for welding, painting and assembly. It achieved ISO 9002 status in 1998 for output quality and ISO 14001 for environmental management in 2002.

In 2007 Komatsu announced that it would build a second factory for hydraulic excavators on the site, spending ¥1.0 billion on the factory, which started production in August 2007. The 9,700 m^2 extension doubled the production capacity to 6,000 units from its previous level of 3,000 units and further expansion is currently being planned to increase this to 9,000 units. The number of employees has subsequently risen to 570 people. The plant operates as an assembly facility only and all fabrication, painting and sub-assembly operations are carried out in the original factory.

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PRODUCT RANGE

During the last five years the product offering has been expanded and, in addition to the 20 tonne PC200 model, which traditionally accounts for some 80 per cent of output, now encompasses the PC70, production of which began in June 2014, PC130, PC160 and 30 tonne PC300 crawler excavators. All models are Dash-8 specification and feature Tier 3 engines.

Production of WA200-5 wheeled loaders was started in December 2013 due to increasing demand in the Thai market; production of WA320 and WA380 models will be phased in during late 2014.

PRODUCTION

Table 102. Bangkok Komatsu: Production of Crawler Excavators, 2009-2013 (Units)

2009	2010	2011	2012	2013
2,700	4,100	5,800	4,300	3,200

Source: Off-Highway Research

An improving domestic market and buoyant exports have resulted in a rapid expansion of production volumes in recent years. In addition, recent increases in the Chonburi plant's production capacity have also seen the transfer of some PC300 model production from the Komatsu excavator plant in Indonesia. Output peaked at nearly 6,000 units in 2011 in response to sharply rising demand in the Thai and Indonesian markets, although declined significantly in 2013 as a result of reduced demand in Thailand.

Component Sourcing: Komatsu has focused heavily on localising component supply, which now accounts for some 76 per cent. The remaining 24 per cent of the components used come from Japan, notably the engines, hydraulics and control systems.

Komatsu has an interest in two local parts suppliers. Bangkok Komatsu Industries is a foundry, belonging organisationally to the Industrial Division of the corporation. It makes castings for the fork lift truck division and other customers, including the excavator factories in Japan. Founded in 1989 as a joint venture with Bangkok Motor Works, it has been expanded twice, in 1995 and 2006, and has an output of around 1,200 tonnes.

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Table 103. Bangkok Komatsu: Component Sourcing for Hydraulic Excavators, 2014

Booms	In-house
Buckets	Sub-contractor in Thailand
Cabs	Sub-contractor in Thailand
Cylinders	Komatsu Japan
Engines	Komatsu Japan
Hydraulic Motors	Komatsu Japan
Hydraulic Pumps	Komatsu Japan
Slewing Rings	Sub-contractors in Korea and China
Sticks	In-house
Tracks	Sub-contractor in Thailand
Transmissions	Komatsu Japan
Undercarriages	In-house*
Upper Frames	In-house*

* Made with plate from Komatsu Indonesia
Source: Company Information

EXPORTS

Exports began in 1997, expanding to include sales to the USA in 1998. Since then exports have widened in scope and PC200s made in Thailand have been sold to around 30 countries. Exports currently account for around 80 per cent of production with approximately 50 per cent of output being shipped to Indonesia. The Thai and Malaysian markets combined constitute 30-40 per cent of production, whilst the bulk of the remaining output is exported to Laos, Myanmar, Vietnam and Papua New Guinea. Other markets include the Philippines, Australia, New Zealand and South Africa. The bulk of PC300 production is sold to Indonesia, whilst the low volume PC130 is mainly destined for the UK market. Production of the 16 tonne PC160 model is focused on the domestic and Australian markets.

DISTRIBUTION

Bangkok Komatsu Sales Co. Ltd sells all the excavators destined for Thai customers, and there is a profile of this company in the Distributor Profiles section of this report.

DOMESTIC SALES

Details are available in the profile of Bangkok Komatsu Sales Co. Ltd.

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CATERPILLAR (CRTT)

Address	**Caterpillar (Thailand) Limited** CRTT – Caterpillar Rayong Thailand Tractors 337/1 Moo 3 Tambon Nonglalok Aumphur Bankhai Rayong 21120
Telephone	+66 (0)33 011 201
Key Personnel	James D. Sickinger, Deputy General Manager
Employees	425. This figure is expected to rise to around 900 once the facility begins operating at full capacity.

Source: Company Information

HISTORY

In January 2011 Caterpillar announced its intention to expand its manufacturing operations in Thailand by building a new facility to produce medium sized crawler dozers. Construction of the 40,000 m² factory began in October 2011 at the Hemaraj Rayong Industrial Land in Rayong Province, close to the huge Eastern Seaboard industrial estate, the home of the Thai automotive industry. The name of the manufacturing operation is Caterpillar Rayong Thailand Tractors, otherwise known as CRTT.

Construction of the new facility was completed in January 2013 and manufacturing operations began in March 2013. It was designed specifically to increase the global production of Caterpillar's medium sized track-type tractors to respond to the growth in demand for the company's products, particularly from developing markets. The decision to site the factory in Thailand in preference to other locations in the region such as Singapore, Vietnam, Indonesia and Malaysia, was taken since it was felt that Thailand offered competitive advantages in terms of shipping logistics, a comprehensive supplier base and government support.

MANUFACTURING FACILITIES

The plant encompasses 40,000 m² on a total site area of 21 hectares. It is a full manufacturing facility and incorporates an in-line flow production system; it also houses fabrication and welding shops, paint facility and on-site metallurgical and chemical testing laboratories. All major machining and work tools are of identical specification to other Caterpillar global manufacturing facilities.

The Rayong plant has the capability to manufacture all major components such as track roller frames, case and frame in-house, and undertakes all its own heavy welding operations. All components are finish painted before assembly.

PRODUCT RANGE

The current production programme encompasses two models – the D6R, designed for general construction applications, and the D8R for use in larger scale

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construction and logging applications. Both models feature Tier 2 or Tier 3 engines. D5 and D7 models will be incorporated into the production schedule at a later date.

PRODUCTION

Deliveries of the first new dozers began in May 2013. The plant is still in its development stage and is currently producing around 30 machines per month, although this volume is likely to double once it becomes fully operational.

COMPONENT SOURCING

Table 104. Caterpillar: Component Sourcing for Crawler Dozers, 2014

Component	Supplier
Blades	Locally sourced
Cabs	Caterpillar China
Cylinders	Caterpillar USA
Engines	Caterpillar USA
Frames	CRTT*
Fuel Tanks	Locally sourced
Hydraulic Pumps	Caterpillar USA/China
Hydraulic Tanks	Locally sourced
Track Roller Frames	CRTT*
Transmissions	Caterpillar China
Undercarriages	Caterpillar USA

* CRTT – Caterpillar Rayong Thailand Tractors
Source: Company Information

EXPORTS:

The main export destination for crawler dozers assembled in Rayong is Indonesia, particularly the D8R, which is used extensively in logging applications. Other markets include Malaysia, India, Africa and Middle East. In the longer term, the Russian market is expected to assume increasing importance. These markets were previously served by Caterpillar dozer factories in Brazil and Japan.

DISTRIBUTION

Metro Machinery is the official Caterpillar dealer for Thailand and sells all machines destined for Thai customers. Export markets are served exclusively by officially appointed Caterpillar distributors.

DOMESTIC SALES

Details are available in the profile of Metro Machinery.

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HIDROMEK

Address	**Hidromek Construction Equipment (Thailand) Ltd.** 700/669 Moo 1 Amata Nakorn Industrial Estate Phase 7 T. Phanthong A. Phanthong Chonburi 20160
Telephone	+66 (0)38 447 349 54
Website	www.hidromek.com
Key Personnel	Takafumi Okugawa, President
Employees	165

Source: Company Information

HISTORY

In 1993 Mitsubishi Heavy Industries (MHI) of Japan and Pornchai Equipment, a Bangkok based dealer in used construction equipment, formed a joint venture, MHI-Pornchai Machinery, to assemble motor graders in Thailand. The capital was THB30 million, divided between Pornchai Machinery (55 per cent) and MHI (45 per cent).

In November 2013 MHI agreed to transfer its motor grader business to Hidromek, a leading manufacturer of construction machinery based in Ankara, Turkey. Under the terms of the agreement, Hidromek has purchased MHI's operations in motor graders including MHI's related technologies, design expertise and servicing operations as well as ownership of MHI-Pornchai Machinery Co. Ltd, the production base in Thailand that had manufactured MHI's products for markets in the Middle East and Southeast Asia. For its part, MHI will provide technical support and parts to Hidromek for another two years, as well as offer after-sale servicing support for customers in Japan. At the end of this period, Hidromek will take over these activities.

Following the 100 per cent buyout of shares by Hidromek, the company's name was changed in February 2014 to Hidromek Construction Equipment (Thailand) Ltd, abbreviated to HCE. The capital of the new company is THB170 million.

MANUFACTURING FACILITIES

The old MHI-Pornchai plant on the Bangna-Trad Road, 20 kilometres south of Bangkok was closed in 2009 and production relocated to a new factory on the large Amata Nakorn Industrial Estate in Chonburi. The plant encompasses an area of 4,467 m^2 on a total site area of 14,272 m^2. In May 2014 a second facility was opened some 2 kilometres from the existing plant specifically for the assembly of transmissions.

The Hidromek factory is a dedicated manufacturing operation as opposed to assembly only, and undertakes its own sheet metal cutting and fabrication, welding, machining and painting operations. In addition to graders it also manufactures and

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exports components for Mitsubishi reach stackers and produces sheet metal fabrications for Kawasaki's wheeled loader factory in Japan. The plant achieved ISO 9001 status in 2000 and ISO 14001 certification in 2004.

PRODUCT RANGE

The plant assembles seven models of graders. The original 30 series comprises three models, the MG330 at 11 tonnes, MG430 at 12 tonnes and MG530 at 14 tonnes. Although the largest 210 horsepower MG730 model, designed specifically for Middle East markets, is listed in the product offering, no machines have yet been built. In Thailand the two smallest models are sold as the MG331 and MG431. All models feature powershift transmissions and Mitsubishi Stage IIIB engines.

Following the success of the 30 series, the range has been extended with the introduction of the more advanced high production 60 series graders for use on large construction sites. The 60 series currently comprises one model, the MG460, which is fitted with Mitsubishi's high-capacity 6D24 engine rated at 185 horsepower. The machine also features an eight-speed direct drive planetary transmission, which provides gear ratios to suit all grading applications from heavy ripping to light maintenance.

PRODUCTION

Table 105. MHI-Pornchai/Hidromek: Production of Motor Graders, 2009-2013 (Units)

2009	2010	2011	2012	2013
51	121	212	118	127

Source: Off-Highway Research

During the beginning of the new millennium the plant struggled to produce more than 20 motor graders per year. In 2008 business finally improved as a result of growing demand in Indonesia and production rose to 72 units. Output peaked at over 200 units in 2011, bolstered once again by strong exports to Indonesia, and has subsequently reverted to 120-130 units per year.

All important components come from Japan, notably the engines, hydraulics and control systems. The plant makes frames and blades and undertakes all sheet metal fabrication and machining. Most steel is local but some special steels still have to come from Japan.

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Table 106. Hidromek: Component Sourcing for Motor Graders, 2014

Component	Supplier
Blades	In-house
Cabs	Subcontractor in Japan
Cylinders	Mitsubishi HI Japan
Engines	Mitsubishi HI Japan
Frames	In-house
Hydraulic Motors	Mitsubishi HI Japan
Hydraulic Pumps	Shimasu
Slewing Rings	Mitsubishi HI Japan
Transmissions	Mitsubishi HI Japan

Source: Company Information

EXPORTS

Table 107. MHI-Pornchai: Exports of Motor Graders, 2009-2013 (Units)

2009	2010	2011	2012	2013
51	100	200	110	120

Source: Off-Highway Research

The domination of Caterpillar and the influx of cheap Chinese imports have traditionally hindered sales of Mitsubishi graders in the Thai market, and as a result around 95 per cent of production from the Chonburi plant is exported. By far the most important market remains Indonesia, which typically accounts for up to 65 per cent of overall production. Other significant markets include South Africa, India and the Philippines.

DISTRIBUTION

Mitsubishi graders were formerly sold in Thailand by MHI's joint venture partner Pornchai Equipment, based in Bangkok. Pornchai is no longer active in the new construction equipment business and Hidromek is currently seeking to appoint a new dealer in Thailand. The Turkish company has marketed its backhoe loader product range in the Thai market for three years, although its dealer Krung Thai sells exclusively to the government sector tender business, necessitating the appointment of an additional distributor.

Hidromek has a well-established export distribution network in Europe and Russia, which should facilitate greater worldwide exposure for the company's grader product line. In the established export markets of Southeast Asia sales will continue to be carried out in most cases by the former Mitsubishi grader dealers.

FUTURE DEVELOPMENTS

Currently, the plant produces graders in both Mitsubishi and Hidromek liveries according to which export market the machines are being shipped to. With effect from August 2014 all graders will be produced exclusively in Hidromek's white livery.

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THAI KOBELCO

Address	**Thai Kobelco Construction Machinery Ltd** Eastern Seaboard Industrial Estate 29 Moo 4 Pluakdaeng Rayong 21140
Telephone	+66 (0)38 954790
Key Personnel	Kazunori Yamashita, Managing Director
Employees	550, a large increase compared to the 171 employed in 2007 due to the inauguration of the company's second factory in Rayong in 2008.

Source: Company Information

HISTORY

Thai Kobelco began manufacturing hydraulic excavators in September 1996. As with other manufacturers, the opening unfortunately coincided with the beginning of the cracks in the Thai economy that led to the collapse of the Baht in July 1997. By October 1997 it was necessary to suspend excavator production, but the plant continued to fabricate booms, sticks and buckets for hydraulic excavators made by Kobelco plants in Japan and the USA.

Production of whole machines finally resumed in January 2000, aimed exclusively at the local market and neighbouring countries. Kobelco owns 100 per cent of the company, after the ending of participation by the local dealer, Ariya Equipment.

MANUFACTURING FACILITIES

The original plant, opened in late 1996, is on a 2.7 hectare site on the huge Eastern Seaboard Industrial Estate in Rayong, also home to many motor manufacturers and their suppliers.

In 2008 Kobelco opened a new 71,800 m^2 assembly plant for excavators in Rayong, which is located some 12 kilometres from the original factory. The combined workforce in both factories now encompasses more than 500 people. The new factory serves as a complete assembly operation and no longer assembles kits shipped from Japan. The original factory in Pluakdaeng is now responsible for the sub-assembly of buckets, booms, arms, undercarriages and centre sections of the upper frames.

PRODUCT RANGE

Approximately 80 per cent of production is of the crawler excavator model SK200-8 (20 tonnes). The 13 tonne SK130/SK140 models, production of which was started in 2010, account for some 15 per cent of output; the remaining output is of the 34 tonne SK330-8.

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PRODUCTION

Table 108. Thai Kobelco: Production of Crawler Excavators, 2009-2013 (Units)

2009	2010	2011	2012	2013
970	2,330	3,000	4,250	2,950

Source: Off-Highway Research

During the last three years the plant has been operating at almost full capacity and output has increased threefold compared to just four years ago, primarily due to buoyant domestic demand and expanding Southeast Asian markets.

In 2003 the plant also began the fabrication of crawler undercarriage frames, which are used in Kobelco's plant in Japan for the assembly of crawler excavators up to and including 20 tonnes' service weight. Frames for larger excavators are made in China. The plant also produces booms, sticks and buckets to use in the crawler excavators that it assembles.

COMPONENT SOURCING

Prior to the construction of its new factory in Rayong in 2008, Kobelco only manufactured the booms, sticks and buckets for machines to be sold in Thailand and Southeast Asia. Whole machines were shipped from the company's plant in Japan and were disassembled for final painting. Today the new factory assembles complete excavators and is no longer totally reliant on Kobelco Japan for the supply of components. As a result, engines are now sourced directly from Mitsubishi and Hino in Japan; hydraulic pumps come from Kawasaki in Japan; and hydraulic motors from Kayaba. Undercarriages and superstructures are now sub-contracted to independent suppliers in Thailand.

Table 109. Thai Kobelco: Component Sourcing for Hydraulic Excavators, 2014

Component	Supplier
Booms	In-house
Buckets	In-house
Cabs	Kobelco Japan
Cylinders	Kobelco Japan
Engines	Mitsubishi; Hino
Hydraulic Motors	Kayaba
Hydraulic Pumps	Kawasaki
Slewing Rings	Kobelco Japan
Sticks	In-house
Tracks	Kobelco Japan
Transmissions	Kobelco Japan
Undercarriages	Subcontractor in Thailand
Upper Frames	In-house

Source: Company Information

The original Rayong plant is now responsible for the fabrication and sub-assembly of items such as buckets, booms, arms and bucket links. It also manufactures the centre section of the upper frame. Plate steel is sourced from Thailand and Indonesia. The bucket edges come from a local supplier; the bucket teeth are

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branded Kobelco, sourced from a Korean manufacturer located in China and also supplying Kobelco there.

EXPORTS

Kobelco resumed exports after 2000, with the machines being directed at markets in Southeast Asia and, more recently, India and Sri Lanka. Currently, 70-80 per cent of the production is exported. The Indonesian market accounts for approximately one third of total production with smaller volumes being shipped to Malaysia, Singapore, Laos and India.

DISTRIBUTION

Ariya Equipment sells all the excavators destined for Thai customers and there is a profile of the company in the Distributor Profiles section of this report.

DOMESTIC SALES

Details are available in the profile of Ariya Equipment

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Table 110. Thailand: Distributors of Construction Equipment and Their Franchises, 2014

	Asphalt Finishers	Backhoe Loaders	Compaction Equipment	Crawler Dozers & Loaders	Dump Trucks	Hydraulic Excavators	Mini Excavators	Mobile Compressors	Mobile Cranes	Motor Graders	Skid-Steer Loaders	Telescopic Handlers	Wheeled Loaders
Ariya Equipment	Ammann	-	Ammann	-	-	Kobelco	Kobelco	-	Kobelco	-	-	-	Chenggong
Atlas Copco	-	-	-	-	-	-	-	Atlas Copco	-	-	-	-	-
AVN Motor Works	-	Terex	-	Shantui	-	Hyundai	Hyundai	-	-	-	Hyundai	-	Hyundai
Bangkok Komatsu	-	Komatsu	-	Komatsu	Komatsu	Komatsu	Komatsu	-	-	Komatsu	-	-	Komatsu
Chu Kai	-	-	-	-	-	Zoomlion	-	-	Zoomlion	-	-	-	-
DKSH	Bomag	-	Bomag	Dressta	Doosan	Doosan	Doosan	-	Terex	-	Doosan	-	Doosan
Empire Tech	-	New Holland	-	New Holland	-	New Holland	New Holland	-	-	New Holland	New Holland	New Holland	New Holland
Hidromek Construction Eqpt.	-	-	-	-	-	-	-	-	-	Hidromek	-	-	-
Hitachi Construction Machinery	-	John Deere	-	John Deere	Hitachi	Hitachi	Hitachi	-	-	John Deere	-	-	Hitachi, John Deere
Italthai Industrial	Volvo	Volvo	Volvo	Shantui	Volvo	Volvo	Volvo, Bobcat	Doosan	Tadano	Volvo	Bobcat	-	Volvo, SDLG
Krung Thai Tractor	-	Hidromek	-	-	-	Sumitomo	Yanmar	-	-	-	-	-	Kawasaki
Leadway Heavy Machinery	Sumitomo	-	-	-	Terex	Sumitomo	-	-	Terex	-	-	-	-
Liebherr (Thailand)	-	-	-	-	-	-	-	-	Liebherr	-	-	-	-
Max Crane	-	-	-	-	-	-	-	-	Sany	-	-	-	-
MEC Far East Corp.	Dynapac	-	Dynapac	-	-	-	-	-	-	-	-	-	-
Metro Cranes	-	-	-	-	-	-	-	-	Grove	-	-	-	-
Metro Machinery	Caterpillar	Caterpillar	Caterpillar	Caterpillar	Caterpillar	Caterpillar	Caterpillar	-	-	Caterpillar	Caterpillar	Caterpillar	Caterpillar
MTS	-	-	-	-	-	-	-	-	-	-	-	-	SEM
OCR	-	XCMG	XCMG	-	-	-	-	-	XCMG	-	-	-	XCMG
Paragon Machinery	-	Çukurova	-	Liebherr	BEML	Liebherr	-	-	-	-	-	-	Liebherr, Foton

Source: Off-Highway Research

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Table 108. Thailand: Distributors of Construction Equipment and Their Franchises, 2014 (Continued)

	Asphalt Finishers	Backhoe Loaders	Compaction Equipment	Crawler Dozers & Loaders	Dump Trucks	Hydraulic Excavators	Mini Excavators	Mobile Compressors	Mobile Cranes	Motor Graders	Skid-Steer Loaders	Telescopic Handlers	Wheeled Loaders
Promech Resources	-	-	-	-	-	-	-	-	-	-	Gehl	Manitou	-
Siam Motor Parts	-	JCB	JCB	-	JCB	JCB	JCB	-	-	-	JCB	JCB	JCB
Siam Sun Auto Sales	-	XGMA	XGMA	-	-	XGMA	-	-	-	-	-	-	XGMA
SN Machinery/DMAP	-	-	Sakai	-	-	-	-	-	-	-	-	-	-
Thai Enc	-	-	-	-	-	-	-	-	Terex	-	-	-	-
ThaiYont	Sany	-	Sany	-	-	Sany	-	-	-	Sany	-	-	-
United Motor Works	-	-	-	-	-	Takeuchi	Takeuchi	-	-	-	-	-	-
Wirtgen Thailand	Vögele	-	Hamm	-	-	-	-	-	-	-	-	-	-
Yontrakarn Machinery	-	LiuGong	-	LiuGong	-	LiuGong	-	-	-	LiuGong	LiuGong	-	LiuGong

Source: Off-Highway Research

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DISTRIBUTOR PROFILES

ARIYA EQUIPMENT

Address	**Ariya Equipment Co. Ltd** 9/9 Moo 1 Bangna-Trad Road Rachataewa Bangplee Samutprakarn Bangkok 10250
Tel	+66 (0)2 730 7123
Web	www.ariyagroup.com
Ownership and Formation	Ariya started in 1980 as a small family business selling spare parts of Kobelco hydraulic excavators and Donaldson filters. The company is owned by the Lertariyanunt family and for many years has achieved the status of being the largest Kobelco excavator outlet in the world outside Japan.
Employees	600 in Thailand, including over 200 service and maintenance personnel.
Key Personnel	Somchai Lertariyanunt, President

Source: Company Information

FRANCHISES

Table 111. Ariya Equipment Co. Ltd: Range of Franchises, 2014

Company	Products
Ammann	Compaction equipment, asphalt pavers
Chenggong	Wheeled loaders
Kobelco	Mini and standard hydraulic excavators, crawler cranes
New Holland	Agricultural tractors

Source: Company Information

Ariya's primary focus is the Kobelco crawler excavator franchise with which it vies closely for market leadership in Thailand with Komatsu. The company has subsidiary companies in Laos and Cambodia and is also the official Kobelco dealer in both these markets. The Case franchise was relinquished in 2013 following the termination of Kobelco's partnership with the CNH organisation. Recent additions to Ariya's portfolio have been Ammann compaction equipment in 2012, which it also markets in Laos and Cambodia, and Chenggong wheeled loaders in 2014. The New Holland tractor franchise is administered by a subsidiary company, APAM.

OUTLETS

The company distributes its products through the central headquarters and a network of 27 depots covering the whole country. This massive network is in place to support the strategy of the company, to be a supplier of parts and servicing for all major brands of construction equipment.

SALES

Table 112: Ariya Equipment Co. Ltd: Sales of Construction Equipment in Thailand by Type, 2012-2013 (Units)

	2012	2013
Crawler Cranes – Kobelco	-	2
Crawler Excavators – Kobelco	1,085	811
Soil Compactors – Ammann	5	10

Source: Off-Highway Research

Ariya Equipment has some 25 years' experience of selling for Kobelco and, together with Komatsu, is one of the two leading brands in the hydraulic excavator market. In the fiercely competitive, high volume 20 tonne crawler excavator sector the company regularly commands a market share of 20 per cent, and more recently has established itself as the leading supplier in the growing midi excavator sector with its 7.5 and 14 tonne models. Ariya benefits from the fact that Kobelco produces its 14-40 tonne excavators in Thailand, which gives the product a national identity and some advantage in tender business.

Ariya has sold two Kobelco 150 tonne crawler cranes in 2013 and has already established a small presence in the soil compactor sector with the Ammann product line.

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ATLAS COPCO

Address	**Atlas Copco (Thailand) Ltd** 125 Moo 9 Wellgrow Industrial Estate Bangna-Trad Road Km 36 Bangwa Bangpakong Chachoengsao 24180
Tel	+66 (0)38 562 900
Web	www.atlascopco.com
Ownership and Formation	In 2003 Atlas Copco founded its own company in Thailand and ceased to be represented by Diethelm. The amicable parting of the ways led to the Swedish manufacturer occupying premises in the Wellgrow Estate in Bangpakong, home of Honda cars and many other large manufacturing operations.
Employees	200.
Key Personnel	Chanwit Choon, Manager Portable Air Division

Source: Company Information

FRANCHISES

Table 113. Atlas Copco (Thailand) Co.: Range of Construction Equipment Franchises, 2014

Company	Products
Atlas Copco	Hydraulic hammers
	Mobile compressors

Source: Company Information

OUTLETS

The company distributes its products through the central headquarters near Bangkok and four branches in:

- Ayuthaya
- Lampang
- Nakhon Ratchasima
- Rayong

The company is also responsible for Myanmar, Laos and Cambodia, where DKSH is still its partner.

SALES

Table 114. Atlas Copco: Sales of Construction Equipment by Type, 2012-2013 (Units)

	2012	2013
Mobile Compressors	105	110

Source: Off-Highway Research

Atlas Copco has an undeniably smaller business in mobile compressors than it did. The population of thousands of hydraulic excavators that can carry hammers has cut out the need for the mobile compressor in breaking pavement and demolishing buildings. In the reduced market, it manages a 60 per cent share, far outselling all rivals.

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AVN MOTOR WORKS

Address	**AVN Motor Works Co. Ltd** 38/9 Moo 13 Phaholyothin Road Khlongneung Khlongluan Pathumthani 12120
Tel	+66 (0)2 908 6831-7
Ownership and Formation	In 2003 AVN Motor Works succeeded the company AVN Motor (1993), which took on the Hyundai franchise nearly 20 years ago. The holding company is CS Motor (1987) Co. Ltd, privately owned by the Chaicharoensukasem family, and which was formed in 1987 to sell used construction equipment. Apichart Chaicharoensukasem, the company's managing director, has a 100 per cent shareholding in the business.
Employees	80, including service engineers and mechanics.
Key Personnel	Apichart Chaicharoensukasem, General Manager
Turnover	$30 million.

Source: Company Information

FRANCHISES

The Hyundai construction equipment franchise represents the main focus for AVN. It diversified into selling UK sourced backhoe loaders from Terex some years ago and subsequently began selling Chinese construction equipment, specifically Shantui crawler dozers. It has, however, relinquished franchises for Yishan dozers and SEM backhoe loaders due to concerns about product quality and durability. AVN also sells construction equipment in tenders, without necessarily having a full franchise from the manufacturers concerned.

Table 115. AVN Motor Works Co. Ltd: Range of Franchises, 2014

Company	Products
Hyundai	Full range of construction equipment
Shantui	Crawler dozers
Terex	Backhoe loaders

Source: Company Information

OUTLETS

The sales and service staff are based in Bangkok, where most sales take place. The company sells parts for construction equipment through a network of 7 dealers. It has also recently opened new branches in Chiang Mai, Udon Thani, Phitsunalok and Chachoengsao.

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SALES 2012-2013

Table 116. AVN Motor Works Co. Ltd: Sales of Construction Equipment in Thailand by Type, 2012-2013 (Units)

	2012	2013
Backhoe Loaders – Terex	25	25
Crawler Dozers – Shantui	5	6
Crawler Excavators – Hyundai	177	181
Mini Excavators – Hyundai	5	6
Wheeled Excavators – Hyundai	5	3
Wheeled Loaders – Hyundai	22	26

Source: Off-Highway Research

AVN's share of the crawler excavator market has increased significantly during the last three years and in 2013 Hyundai excavators accounted for around five per cent of overall sales. In contrast to other markets like Laos, Myanmar or Cambodia, Korean products have traditionally suffered from prejudice in favour of Japanese products, although there is some evidence to suggest that they are gaining increasing acceptance in the Thai market. AVN cannot match the financing activities of its big competitors, however, which inevitably hinders a greater rate of progress.

Terex backhoe loaders account for a small but stable level of business each year, whilst in 2014 Hyundai backhoe loaders have been added to the programme. Shantui crawler dozers continue to be sold in small volumes to government tender contracts.

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BANGKOK KOMATSU SALES CO.

Address	**Bangkok Komatsu Sales Co. Ltd** 28/9 Moo 3 Bangna-Trad Road Km 23 Bangsaothong Samutprakarn 10540
Tel	+66 (0)2 663 2666
Website	www.bangkokkomatsusales.com
Ownership and Formation	Bangkok Komatsu Sales Co. Ltd, formerly Bangkok Motor Works, is one of 50 companies in the Siam Motors Group, one of the leading private enterprises in Thailand. The origin lies in the Siam Motor Co. established in 1952 by Dr. Thaworn Phornprapha to distribute Nissan cars in Thailand, the first sales outside Japan for the company. In April 2010 Bangkok Motor Works entered a joint venture agreement with Komatsu Ltd of Japan, in which the manufacturer acquired a 40 per cent shareholding in the enterprise via its subsidiary, Komatsu Asia Pacific PTE Ltd. The remaining 60 per cent of the new company, Bangkok Komatsu Sales Co. Ltd, is held by its president, Dr. Phornthep Phornprapha, and his son, vice president, Mr. Pranitan Phornprapha. Although the founder died in 2001, the group is still a family enterprise and, with Nissan vehicles and parts as its main products, it has eight business groups and comprises 46 companies spanning manufacturing, trading, tourism and education. Heavy machinery, air-conditioners, elevators and escalators are its other key products. The group owns a 325 hectare industrial estate on the outskirts of Bangkok, where it produces a wide array of goods, from small household consumer goods to diesel engines and Nissan passenger cars. Dr Phornprapha established Bangkok Motor Works in 1956 as the Heavy Equipment Division of Siam Motors, mainly to distribute and service construction equipment from Japan and Europe. Bangkok Komatsu Sales Co. Ltd is now part of the Construction and Machinery Group, along with Bangkok Komatsu Co. Ltd, the excavator manufacturing venture in which it has a 25 per cent share (see profile). In other member companies of that group are a manufacturer of castings for forklift trucks and diesel engines; the manufacturer of Hitachi elevators and escalators; and a distributor of Daikin air conditioning systems.
Employees	420, more than 200 of whom work on customer support.
Key Personnel	Pranitan Phornprapha, Vice President

Source: Company Information

FRANCHISES

Table 117. Bangkok Komatsu Sales Co. Ltd: Range of Franchises, 2014

Company	Products
Komatsu	Crawler dozers, dump trucks, hydraulic excavators, mini excavators, motor graders, wheeled loaders

Source: Company Information

The company focuses on five main product groups: crawler excavators, crawler dozers, motor graders, wheeled loaders and rigid dump trucks. The growth in the mini excavator sector has encouraged the dealer to begin promoting the Komatsu product with effect from 2014, although Komatsu compact construction equipment built in Italy is not marketed in Thailand due to parts logistics and service support considerations.

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OUTLETS

The Bangkok centre houses the administration and finance section, as well as a local office of Komatsu Asia Pacific. There are a total of 22 company owned branches situated in the following locations:

- Bangkok
- Chanthaburi
- Chiang Mai
- Chiang Rai
- Chonburi
- Hat Yai
- Khon Kaen
- Lampang
- Nakhon Ratchasima
- Nakhon Sawan
- Nawanakhon
- Phitsanulok
- Phuket
- Prachuap Khiri Khan
- Ratchaburi
- Rayong
- Saraburi
- Surat Thani
- Surin
- Tungsong
- Udon Thani
- Ubon Ratchathani

Around 70 independent dealers still retail Komatsu spare parts around the country.

SALES

Table 118. Bangkok Komatsu Sales Co. Ltd: Sales of Construction Equipment in Thailand by Type, 2012-2013 (Units)

	2012	2013
Crawler Dozers	5	4
Crawler Excavators	1,020	870
Rigid Dump Trucks	10	6
Wheeled Loaders	33	48

Source: Off-Highway Research

Bangkok Komatsu is still the leading supplier of hydraulic excavators. It has strong financial backing from its motor industry parent and has the advantage of being able to source its main offering from a plant within the country. The 20 tonne PC200 accounts for around 75 per cent of annual sales, whilst the PC130 and PC160 models, rated at 13 and 16 tonnes respectively, make up 20 per cent of the volume.

During the last four years one of the dealer's main priorities has been to target new customers in the highly profitable mining sector more aggressively, and to offer a greater challenge to its main competitors Caterpillar and Hitachi. A dedicated service support team for mining customers has been established and notable success has been achieved with package sales of excavators and rigid dump trucks. Significantly, in 2012 the company won orders from EGAT for four PC3000 and two PC1250 mining shovels. It also has a strong position in crawler dozers and its machines are an extremely popular choice in the used equipment market.

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CHU KAI

Address	**Chu Kai Public Company Ltd.** 42/62 Moo 14 Bangna-Trad Rd. Km 7 Bangkaew Bangplee Samutprakarn 10540
Tel	+66 (0)2 715 0000
Website	www.chukai.co.th
Ownership and Formation	The company was originally established in 1990 as The Crane Services Co. Ltd (TCS) by Mr. Thongchai Praerangsi in order to provide rental services for cranes, forklifts and other lifting machinery. The Group consists of the following subsidiary companies: The Crane Laem Chabang Co. Ltd (TCL), The Crane Rayong Co. Ltd (TCR) and The Crane Heavy Lift Co. Ltd (TCH). Chu Kai Co. Ltd, the subject of this profile, was established by Mr. Thongchai Praerangsi in 1997 as a separate subsidiary company to sell both new and used cranes. As one of Thailand's top three heavy-lifting companies, Chu Kai sells, leases and repairs cranes used in the hoisting, installation and assembly of various heavy equipment and objects. The company manages a fleet of 200 mobile cranes for rent and is the only heavy lifter in the country that can hoist an object weighing up to 1,250 tonnes. It also offers repair services, employing around 100 technicians and covers a wide range of industries such as construction, refineries, power and petrochemical plants, mining, and marine. Zoomlion appointed Chu Kai as its exclusive distributor for truck-mounted, rough terrain, all terrain cranes and crawler cranes on 1st August 2010. It has also begun to market the Zoomlion range of crawler excavators since 2012.
Employees	400 people work in the Group, 100 of whom are employed in Chu Kai.
Key Personnel	Thongchai Praerangsi, CEO, Jiraporn Praerangsi, Vice President
Turnover	THB1,414 million.

Source: Company Information

FRANCHISES

Table 119. Chu Kai Public Company Ltd: Range of Construction Equipment Franchises, 2014

Company	Products
Zoomlion	All terrain cranes, crawler cranes, crawler excavators, rough terrain cranes, truck cranes

Source: Company Information

OUTLETS

The Group's headquarters is situated on the Bangna-Trad road in Samutprakarn province.

SALES

Table 120. Chu Kai Public Company Ltd: Sales of Construction Equipment in Thailand by Type, 2012-2013 (Units)

	2012	2013
Crawler Cranes	10	7
Crawler Excavators	10	14
Rough Terrain Cranes	5	3
Truck-Mounted Cranes	120	90

Source: Off-Highway Research

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Chu Kai has delivered over 300 new Zoomlion cranes since taking on the franchise in 2010. Around 70 per cent of sales are to crane rental companies, although the company has also sold machines to construction and industrial companies. Truck-mounted cranes account for the majority of sales, although the dealer is currently focusing on increasing its penetration of the rough terrain and crawler crane sectors.

FUTURE DEVELOPMENTS

Planned infrastructure and construction projects in Thailand are set to rise significantly in the medium to long term as the country develops into a major regional hub under the Asean Economic Community. Chu Kai is well set to benefit from such developments, particularly in view of the increasing acceptance of Chinese cranes in the Thai market. Chu Kai is also forging strategic partnerships with overseas logistics and transport companies to exploit the business potential offered by increased construction activities in neighboring countries like Laos, Myanmar and Vietnam.

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DKSH (THAILAND)

Address	**DKSH (Thailand) Ltd** 2106 Fantree 4 Building Sukhumvit Road Bangchak Phrakhanong Bangkok 10260
Tel	+66 (0)2 2301 7200
Website	www.dksh.co.th
Ownership and Formation	DKSH (Thailand) is a wholly owned subsidiary of a merged firm, DKSH Holding. In 2000 Diethelm, a privately owned Swiss trading company, merged with another Swiss company, Edward Keller. Diethelm Keller Group then merged in 2002 with another privately owned Swiss trader, SiberHegner. DKSH had net sales in 2013 of CHF9.5 billion and employs 26,700 people. The Thai company's name was changed in December 2009 from Diethelm to DKSH (Thailand). Diethelm began operations in Thailand in 1906 in the textiles business and since then it has developed into one of the largest and most diversified trading companies in the country. It operates under five business units: • Consumer goods. • Healthcare. • Luxury and Lifestyle. • Performance Materials. • Technology. Within the Technology business unit, the Infrastructure division is responsible for the sales and marketing of construction and earthmoving equipment, mining and quarrying equipment, and transport and container handling equipment for use in ports, industrial plants and factories.
Employees	In Thailand the DKSH group employs about 10,000 people, of whom 100 work for the Technology Division.
Key Personnel	Keattichai Thongbor, Executive Business Manager, Technology.
Turnover	THB1,070 million in Thailand.

Source: Company Information

FRANCHISES

Table 121. DKSH (Thailand) Ltd: Range of Construction Equipment Franchises, 2014

Company	Products
Bomag	Compaction equipment
Doosan	Construction equipment
Dressta	Crawler dozers
Terex	All terrain cranes, rough terrain cranes

Source: Company Information

DKSH has held the **Doosan** franchise since 1999, although does not market the Bobcat line of compact equipment, which remains in the hands of the Italthai organisation. It has had **Bomag** compaction equipment since 2000 and has supported the expansion of the name into the planers and asphalt finishers made in Italy. **Dressta** crawler dozers from Poland are officially in the programme, although few sales have been made in recent years and DKSH does not actively market the product.

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OUTLETS

The company's head office is situated in the Phrakhanong district of Bangkok; this is supported by an additional seven branches throughout the country.

SALES

Table 122. DKSH (Thailand) Ltd.: Sales of Construction Equipment in Thailand by Type, 2012-2013 (Units)

	2012	2013
Compaction Equipment – Bomag	30	12
Crawler Excavators – Doosan	176	136
Rough Terrain Cranes – Terex	2	1
Wheeled Excavators – Doosan	15	15
Wheeled Loaders – Doosan	15	17

Source: Off-Highway Research

Doosan construction equipment, coming from Korea, inevitably faces the problem of prejudice in favour of Japanese products, although, more recently, favourable exchange rates have resulted in a welcome increase in market share. It cannot match the financing activities of its big competitors, and the prices are too high to compete with the top Japanese names. The dealer focuses primarily on the crawler excavator and large wheeled loader product sectors, although is also active in the wheeled excavator market where the Doosan product is well respected. **Bomag** soil compactors continue to sell in relatively small volumes and the introduction of competitively priced 10 tonne tandem rollers from Bomag's facility in China also enables DKSH to compete in the asphalt roller market.

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HITACHI CONSTRUCTION MACHINERY

Address	**Hitachi Construction Machinery (Thailand) Co. Ltd** 1858/79, 1858/81-82 Nation Tower 17th Floor, Bangna-Trad Road Bangna Bangkok 10260
Tel	+66 (0)2 325 1011-27
Website	www.hitachi-c-m.com/asia
Ownership and Formation	Hitachi Construction Machinery formed a joint venture in 1990, with the major partner being Siam Cement Co. Ltd. The Thai partner took 51 per cent of the equity, Hitachi Construction Machinery of Japan 44 per cent and Nichimen Corp. the rest. Siam Cement invested in various businesses at that time, including farm machinery with Kubota and batteries with Furukawa, but in 2000 it identified Siam-Hitachi Construction Machinery as one venture in which it wished to reduce its commitment, as part of a restructuring initiated in 1998. Hitachi Construction Machinery increased its participation in the company in 2000 to 77.6 per cent and Nichimen to 12.3 per cent, and then in 2003 Hitachi took over entirely. The new 100 per cent subsidiary of Hitachi Construction Machinery opened for business in January 2004. It has a capital of Bt300 million.
Employees	260 people work for the company in Thailand, including 150 field service staff. 110 administration staff support them.
Key Personnel	Takao Hirai, Managing Director

Source: Company Information

FRANCHISES

Table 123. Hitachi Construction Machinery (Thailand) Co. Ltd: Range of Franchises, 2014

Company	Products
Hitachi	Full range of construction equipment
John Deere	Backhoe loaders, crawler dozers, motor graders, wheeled loaders

Source: Company Information

In Asia the marketing of **Hitachi** construction equipment is combined with that of **John Deere**. Hitachi sources motor graders, backhoe loaders, crawler dozers and wheeled loaders from Deere. Since 2000 it has been marketing articulated dump trucks sourced from Bell in South Africa, but painted in Hitachi livery.

OUTLETS

The company distributes its products from its large headquarters in Bangkok. This has offices, large service and maintenance facilities and a considerable storage area for parts. Outside Bangkok there are four dealers. In addition, there are 17 company owned branches in the following locations:

- Chonburi
- Chiang Rai
- Khon Kaen
- Lampang
- Nakhon Pathom
- Pramburi
- Ratchaburi
- Roiet
- Saraburi
- Surat Thani

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- Nakhon Ratchasima
- Nakhon Sawan
- Nakhon Si Thammarat
- Phitsanulok
- Surin
- Ubon Ratchathani
- Udon Thani

SALES

Hitachi performs strongly in the crawler excavator market and has established itself as the fourth largest supplier. The company's ZX200 machine is sourced from Indonesia and keen pricing has allowed Hitachi to adopt an aggressive marketing strategy in what is a fiercely competitive sector. It has traditionally been strong in big excavators and rigid dump trucks, particularly in the mining sector where in past years it has achieved 100 per cent of the market, although more recently it has faced increasing competition from Komatsu in this sector. The John Deere product line continues to provide an interesting diversion from the mainline Hitachi programme, and notable success has been achieved with crawler dozers and motor graders.

Table 124. Hitachi Construction Machinery (Thailand) Co. Ltd: Sales of Construction Equipment in Thailand by Type, 2012-2013 (Units)

	2012	2013
Backhoe Loaders – John Deere	2	-
Crawler Dozers – John Deere	21	13
Crawler Excavators – Hitachi	784	561
Mini Excavators – Hitachi	1	2
Motor Graders – John Deere	9	8
Rigid Dump Trucks – Hitachi	4	-
Wheeled Loaders – Hitachi	19	17
Wheeled Loaders – John Deere	-	2

Source: Off-Highway Research

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ITALTHAI INDUSTRIAL

Address	**Italthai Industrial Co. Ltd** 2013 New Petchburi Road Bangkapi Huay Kwang Bangkok 10310
Tel	+66 (0)2319 1031-40
Website	www.italthaigroup.com
Ownership and Formation	Italthai Industrial is one of the companies within the Italthai group. The Italthai Group had its foundations in the friendship between Dr. Chaijudh Karnasuta, a Thai and Mr. Giorgio Berlingieri, beginning in 1954. The two founders first joined hands in a salvaging operation of five ships sunk in the Chao Phraya River. These salvage operations called for a ready supply of industrial oxygen, so in 1955 the two established a small oxygen plant to be operated by a newly registered company which they called Italthai Industrial Co. Ltd. The broader purpose was to import technical services and special products to serve the needs of Thailand. In 1958 the partners founded Italian Thai Development Public Company Limited (ITD). The objectives were the development of a diversified trading company and a major contracting firm. The Italthai Group comprises more than 50 companies and employs more than 30,000 full time staff. Some of the most famous landmarks in Thailand have been built by the group: Bangkok's Suvarnabhumi Airport, Khao Laem Multipurpose Dam and Tunnel, Laem Chabang Port, the BMA five Flyover Bridges Project, and Bangkok's Skytrain.
Employees	Approximately 400, with 30 people working in the Laos subsidiary company.
Key Personnel	Atiphong Phongwan, Chief Operating Officer, Sarun Veangsong, Senior Vice President
Turnover	THB4,200 million. Turnover in the Laos subsidiary amounted to THB300 million.

Source: Company Information

FRANCHISES

Table 125. Italthai Industrial Co. Ltd: Range of Franchises, 2014

Company	Products
Atlas Copco	Drill rigs
Bobcat	Mini excavators skid-steer loaders, telehandlers
Doosan Infracore	Lighting towers, mobile compressors
Montabert	Hammers and drills
Power Curber	Slip form pavers
SDLG	Backhoe loaders, wheeled loaders
Tadano	Mobile and TM cranes
Terex Pegson	Mobile crushers, power screens/washers
Volvo	Full range of construction equipment

Source: Company Information

Italthai maintains a diversified catalogue and the comprehensive **Volvo** portfolio enables the dealer to compete in all the main volume sectors of the market. The main focus remains the crawler excavator sector, where increasing acceptance of Korean built products and favourable pricing structure have served to expand Volvo's market share significantly during the last three years. Mini excavators are of increasing interest and Italthai has already established a presence in the 5-6 tonne sector with its Korean sourced EC55 model. The franchise for SDLG wheeled loaders from China was taken on in 2012 in order to enable the dealer to respond to the growing dominance of Chinese suppliers in the sector.

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In 2011 Italthai was awarded the Volvo Construction Equipment franchise for Laos where it now operates a dedicated subsidiary company, Italthai Lao Machinery Solution Co. Ltd, complete with full workshop facilities and a three branch distribution network.

OUTLETS

The company's head office is located in the Huay Kwang district of Bangkok. Construction equipment products are distributed through the equipment central headquarters in Samut Sakhon. Significant investment has been undertaken during the last three years to expand the company's service network and sales force throughout the country and four new branches have been opened during this period. The complete network of depots is as follows:

- Ayutthaya
- Chachoengsao
- Chonburi
- Hat Yai
- Khon Kaen
- Korat
- Lampang
- Phuket
- Surat Thani
- Ubon Ratchathani

SALES

Table 126. Italthai Industrial Co. Ltd: Sales of Construction Equipment in Thailand by Type, 2012-2013 (Units)

	2012	2013
Asphalt Finishers – Volvo	1	3
Backhoe Loaders – SDLG	1	-
Compaction Equipment – Volvo	45	50
Crawler Excavators – Volvo	490	389
Mini Excavators – Bobcat	2	2
Mobile Compressors – Doosan	25	25
Mobile Cranes – Tadano	22	35
Motor Graders – Volvo	3	13
Skid-Steer Loaders – Bobcat	20	20
Wheeled Excavators – Volvo	13	6
Wheeled Loaders – Volvo	10	8
Wheeled Loaders – SDLG	23	62

Source: Off-Highway Research

Volvo hydraulic excavators are competitively priced and have increased their market share from six per cent to 11 per cent since the publication of Off-Highway Research's last report in 2011. Historically, Korean suppliers have struggled to compete with the top Japanese brands as a result of traditional prejudice against Korean products, although there is little doubt that advances in product quality in recent years have resulted in growing acceptance by Thai customers. Italthai has made significant progress in the crawler excavator sector and has also benefited

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from the implementation of an aggressive marketing strategy, which has entailed favourable trade-in prices and attractive leasing schemes. The Swedish wheeled loaders are marketed as a premium product but suffer from uncompetitive pricing.

The recent introduction of **SDLG** wheeled loaders has, however, allowed the dealer to quickly establish a significant foothold in a sector now dominated by Chinese suppliers. The proliferation of relatively cheap 10 wheel on-highway trucks means that demand for Volvo articulated dump trucks is virtually non-existent.

Compaction equipment, on the other hand, continues to flourish on the back of Italthai's long standing success in the Thai market with the former **Ingersoll-Rand** single drum soil compactors. Now marketed under the Volvo brand, its largest selling machines are sourced from China, which enables the company to compete very competitively in the important soil compactor sector. The tandem rollers are sourced from India but the market is limited and only incremental sales are achieved annually.

Unfortunately, the restricted nature of the Thai market means that Italthai is unable to maximise the potential of the **Bobcat** compact equipment portfolio and only a minimal volume of skid-steer loaders and mini excavators volumes have been sold. In the mobile crane sector **Tadano** rough terrain cranes from Japan account for a small volume of units each year, whilst sales of German built **Tadano Faun** all terrain cranes reached an impressive 14 units in 2013.

FUTURE DEVELOPMENTS

Progress continues to be made in the important crawler excavator sector and the company's goal, set in 2011, of achieving a market share of 15 per cent and fourth position within five years, appears well on course.

The award of the Volvo franchise for Laos has already proved to be an exciting and lucrative opportunity for Italthai to expand its business activities in a growing market. Of particular interest are the gold mining and hydro-dam construction sectors in Laos, which are currently the subject of massive investment and offer significant potential not only for excavators, but also articulated dump trucks.

Italthai continues to operate a rental division along very close lines to the Volvo Rents scheme. It is effectively restricted to the rental of used machines on contracts over six months and the scheme is open to selected customers only. The rental fleet comprises around 100 units, mainly of crawler excavators but also compactors and ancillary equipment.

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KRUNG THAI TRACTOR

Address	**Krung Thai Tractor Co. Ltd** 3675 Rama 4 Road Phrakanong Klongtoey Bangkok 10110
Tel	+66 (0)2 661 3666; 261 9999
Website	www.ktt.co.th
Ownership and Formation	Krung Thai has been in business since the 1960s, when it was Krung Thai Import-Export Co. Privately owned, it specialised in used construction equipment for many years, and then in the early 1980s took up the franchises for Sumitomo Link-Belt and Kawasaki construction equipment.
Employees	In recent years Krung Thai has drastically reduced the size of its construction equipment activity. It used to recondition diverse machines to high standards and the activity employed a large workforce that has been eliminated. Around 120 people now work in Krung Thai.
Key Personnel	Viboon Laohapongchana, President, Saravut Laohapongchana, Managing Director
Turnover	Approximately THB620 million.

Source: Company Information

FRANCHISES

Table 127. Krung Thai Tractor Co. Ltd: Range of Franchises, 2014

Company	Products
Atlas Copco	Machine tools
Doosan	Fork lift trucks
Hidromek	Backhoe loaders
Kawasaki	Wheeled loaders
Sumitomo	Hydraulic excavators
Yanmar	Mini excavators

Source: Company Information

The **Kawasaki** wheeled loaders are still the primary focus for the company, but the importance of the **Sumitomo** excavator and **Yanmar** mini excavator has declined significantly in recent years. The company also sells Doosan industrial forklift trucks and airport ground handling machines. In 2010 it also took on the franchise for the Turkish built **Hidromek** backhoe loaders but does not market that company's crawler excavator line due to a conflict of interest with the Sumitomo product range.

OUTLETS

The company has two large workshops, in Bangkok and Rangsit.

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SALES

Table 128. Krung Thai Tractor Co. Ltd: Sales of Construction Equipment in Thailand by Type, 2012-2013 (Units)

	2012	2013
Crawler Excavators – Sumitomo	35	15
Wheeled Loaders – Kawasaki	50	50

Source: Off-Highway Research

Krung Thai Tractor has been associated with **Kawasaki** construction equipment for over 20 years and the wheeled loaders are by far its most active account in new machines. Following the rapid influx of low cost Chinese wheeled loaders during the last three years, Kawasaki's traditional position as market leader has inevitably been usurped, although the company continues to retain a loyal customer base in Thailand consisting primarily of sugar, rice and cassava mills. These cash-rich enterprises are prepared to pay a premium for the quality, longevity and reliability of the product and undertake regular fleet replacement programmes, resulting in a high level of repeat business for Krung Thai.

The **Sumitomo** crawler excavators are sold exclusively to government sector tenders, although volumes have declined significantly in recent years. Sales of Sumitomo excavators to the private sector are undertaken by Leadway Heavy Machinery, based in Chachoengsao.

In 2011, its first full year representing the brand, Krung Thai secured a government tender order for 28 **Hidromek** backhoe loaders, although no sales have been made in the subsequent two years.

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LEADWAY HEAVY MACHINERY

Address	**Leadway Heavy Machinery Co. Ltd** 111/1 Moo 2 Bangna-Trad Highway 40 T. Bangwua, A. Bangpakong Chachoengsao 24180
Tel	+66 (0)38 540 352-4
Website	www.leadwayheavy.com
Ownership and Formation	Leadway Heavy Machinery is part of a group of companies, which operate in the markets for heavy equipment and machinery in Southeast Asia. Leadway International Ltd. (LWI) is a privately held corporation based and registered in Hong Kong with an authorised capital of 10,000,000 HKD. The Leadway Heavy Machinery (LHM) Group was originally established in 1996 as a dealer for used Sumitomo hydraulic excavators, which it exported from Thailand to Myanmar.
Employees	Leadway Heavy Machinery currently employs a workforce of 50 people in Thailand.
Key Personnel	Chakart Seanchan, President and CEO, Saroj Chochuwor, COO, Peera Pornpanich, General Manager, Sales and Marketing
Turnover	Gross turnover in 2013 was in excess of US$23 million.

Source: Company Information

FRANCHISES

Table 129. Leadway Heavy Machinery: Range of Franchises, 2014

Company	Products
Sumitomo	Asphalt finishers, hydraulic excavators
Terex	Dump trucks, truck cranes

Source: Company Information

Leadway has held the official distributor rights for Sumitomo in Myanmar since 2001, and on 1st May 2012 was awarded the Sumitomo franchise for Thailand. It has also recently taken on the franchise for the UK sourced range of Terex rigid and articulated dump trucks. Leadway is an authorised dealer for the Terex truck-mounted cranes built in China and is also able to sell Terex all terrain cranes on a non-exclusive basis.

OUTLETS

The company's head office in Thailand is located in Chachoengsao, approximately 100 kilometres east of Bangkok. It has additional branches in Lampang, Khon Kaen, and Nakhon Si Thammarat. In 2014 a further three branches are scheduled to open in Phuket, Ubon Ratchathani and Nakhon Sawan.

In Myanmar, Leadway has branches Yangon, Phakant, Nay Pyi Taw and Mandalay. It is also evaluating the feasibility of opening a new branch in Laos.

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SALES

Table 130. Leadway Heavy Machinery: Sales of Construction Equipment in Thailand by Type, 2012-2013 (Units)

	2012	2013
Asphalt Finishers	-	1
Crawler Excavators – Sumitomo	125	111

Source: Off-Highway Research

Leadway has made remarkable progress in the crawler excavator sector since taking on the Sumitomo franchise in 2012. Much of the company's success has come as a result of shrewd personnel appointments, including experienced senior managers from competitive dealers, who have brought with them a wealth of contacts within the industry. Intimate knowledge of the Sumitomo product, gained from many years of marketing the brand within a diverse range of applications in Myanmar, also enables Leadway to provide a high level of after sales support to its Thai customers, a critical factor in engendering customer loyalty in this most competitive of markets.

The 21 tonne SH210 crawler excavator, sourced from Sumitomo's Indonesian plant, accounts for around 75 per cent of sales. The bulk of remaining sales are split between the smaller SH130 and 35 tonne SH350 model, also sourced from Indonesia. Incremental sales of the Japanese sourced SH480 and SH240 models have also been made during the last two years. In response to increasing demand for midi excavators in Thailand, Leadway will begin importing the 8 tonne SH80 model later in 2014.

Sumitomo asphalt finishers are competitively priced and one unit has already been delivered in 2013.

FUTURE DEVELOPMENTS

Leadway is keen to take on a mini excavator franchise in the medium term in order to exploit this rapidly growing sector. An expansion of the Sumitomo business into neighbouring Laos is also high on the dealer's list of priorities.

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LIEBHERR (THAILAND)

Address	**Liebherr (Thailand) Co. Ltd** 12/555 Kulab Building 6th Floor Bangna-Trad Road Km 5.5 Bangkaew Bangplee Samutprakarn 10540
Tel	+66 (0)2 316 1430-1
Website	www.liebherr.com
Ownership and Formation	Liebherr International founded its Thai subsidiary in April 1997. Besides the sales office in Samutprakarn province near Bangkok, the company operates an assembly plant in Rayong for concrete mixers and plants to be sold in Southeast Asia. The plant also has a licence to assemble kits of mobile cranes and is able to fabricate crawler crane lattice booms. It is located on a nine hectare site and comprises two buildings, with a covered area of 9,000 m2. One makes concrete machinery, on machine tools largely made by Liebherr in Germany; the other is a crane service workshop. The Mobile Crane Division is based in the offices of Liebherr (Thailand) in Samutprakarn, although reports directly to Liebherr Singapore. It is responsible solely for the sales and service of mobile cranes (all terrain, crawler, truck-mounted) produced in the Liebherr-Werk Ehingen facility in southern Germany. In addition to Thailand, the division administers business in Laos and Cambodia.
Employees	150. Six people work in the mobile crane division.
Key Personnel	Nitisan Nitipavachon, Sales Manager Mobile Cranes

Source: Company Information

FRANCHISES

Table 131. Liebherr (Thailand) Co. Ltd: Range of Franchises, 2014

Company	Products
Liebherr	Concrete machinery and mining machinery, mobile cranes

Source: Company Information

Sales of Liebherr earthmoving machinery in Thailand are the responsibility of an independent dealer, Paragon Machinery, and the Liebherr Singapore subsidiary company. Liebherr Singapore is also responsible for the complete harbour and crawler crane product line manufactured at the Nenzing factory in Austria. Liebherr tower cranes are marketed by another independent dealer, Sino-Thai Intertrade.

OUTLETS

There is a sales office at the headquarters in Rayong and one in Samutprakarn province close to Bangkok. The Liebherr Thailand operation is also responsible for sales activities in Laos, Cambodia and Myanmar.

SALES

Liebherr sold one 130 tonne all terrain crane in 2012 and in 2013 sold three high capacity all terrain cranes and one 300 tonne crawler crane. In 2014 it has already confirmed orders for one 500 tonne and two 55 tonne all terrain cranes. The company's main customer base comprises the large rental companies, specifically

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TSK and Saha Crane. Liebherr used cranes are marketed directly in Thailand by Liebherr-Werk Ehingen.

FUTURE DEVELOPMENTS

Following the reduction in import tax on new cranes from 40 to 10 per cent in 2011, Liebherr is keen to expand sales of mobile cranes to large construction companies. It also plans to expand its crane service network and is actively recruiting additional engineers.

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METRO CRANES

Address	**Metro Cranes Co. Ltd** 69 Bangna-Trad Road Km.20 Bangsaothong Samutprakarn
Tel	+66 (0)2 311 0471-4
Ownership and Formation	Metro Cranes was established in June 1990 and is a wholly owned subsidiary of the Metro Machinery Group, best known for its distribution of the Caterpillar product range.
Employees	12
Key Personnel	Vithaya Punyataweekul, Managing Director

Source: Company Information

FRANCHISES

Table 132. Metro Cranes Co. Ltd: Range of Franchises, 2014

Company	Products
Grove	Mobile cranes
National	Truck-mounted pin cranes

Source: Company Information

The company has sold **Grove** products since 1990 and this continued after the acquisition of Grove by Manitowoc of the USA. Sales of Manitowoc cranes in Thailand are handled directly from Manitowoc's Singapore subsidiary, although Metro does provide after sales support for these machines. Potain tower cranes are also within a separate system of distribution.

OUTLETS

The company uses the comprehensive network of 30 Caterpillar service stations throughout the country, details of which are in the next profile. In addition there are four mobile mechanics to cover the Grove fleet of about 160 cranes working in Thailand. Sales, promotion and distribution of mobile cranes are from the company's new offices located at Metro Machinery's main workshop and storage area on Bangna-Trad Road Km 20 in Bangkok. The crane division vacated the Metro Machinery headquarters in Bangkok's Sukhumvit Road in 2008 due to logistical difficulties relating to the transportation of large cranes in one of the city's most congested areas.

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METRO MACHINERY

Address	**Metro Machinery Co. Ltd** 1760 Sukhumvit Road Soi 52-54 Bang Chak Phra Khanong Bangkok 10260
Tel	+66 (0)2 742 8000; 742 9000
Website	www.metrocat.com
Ownership and Formation	Metro Machinery, otherwise known as MetroCat, is the largest member of the Metro Machinery Group, privately owned by the Burapachaisri family. The family has been involved in the businesses of heavy equipment, engines and foundries since the early 1960s. The Group, apart from Metro Machinery itself, consists of the following companies related to construction equipment: • Metro Tech Equipment Co. Ltd is responsible for the servicing of Caterpillar machinery. Metro Cranes Co. Ltd, established in 1990 with a capital of Bt10 million, distributes mobile cranes from Grove. • MTS Engineering and Rental Co. Ltd undertakes the management of the dealer's own rental fleet and the Cat Rental Store in Thailand. Metro Machinery Co. Ltd is the largest unit of the group and was formed in 1977 to take over the distribution of Caterpillar products in Thailand. It operates from extensive premises in Sukhumvit Road, Bangkok, where a large administration block is complemented by an extensive parts warehouse. MMC maintains a THB400 million spare parts inventory of around 25,000 lines, run by a computer system and linked to Caterpillar's regional parts store in Singapore. The main workshop and storage area is located at Km 20 on the Bangna-Trad Road in Bangkok. It covers an area of approximately 32 hectares and caters for regular servicing, repairs and overhauls. Caterpillar reflects the importance of the Thai market in its continued use of a subsidiary district office in the Metro HQ in Bangkok. The Caterpillar staff of 10 works directly with Metro Machinery to serve users of Caterpillar equipment in Thailand, Laos, Cambodia, Myanmar, Vietnam and Bangladesh. Metro Machinery has substantial business activities outside Thailand. Metro Group of Cambodia Co. Ltd is the Cambodian distributor of Caterpillar products; the subsidiary Lao-Metro Co. Ltd performs the same function in Laos. In China the company has a joint venture called Yunnan ECI Metro Engineering Services Co. Ltd. The partner ECI is a subsidiary of the Chia Tai Group and the joint venture covers the provinces of Yunnan, Sichuan, Guizhou and Tibet, as well as the city of Chongqing.
Employees	Around 1,750 people work for the company in Thailand, including more than 500 field mechanics.
Key Personnel	Thongsai Burapachaisri, Executive Chairman

Source: Company Information

FRANCHISES

Table 133. Metro Machinery Co. Ltd: Range of Franchises, 2014

Company	Products
Caterpillar	Full range of construction and mining equipment, fork lift trucks and engines

Source: Company Information

Metro sells the complete Caterpillar construction equipment and mining machinery product lines.

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OUTLETS

The company distributes its products through the central headquarters and a network of 30 depots covering the whole country. Major depots are to be found in:

EASTERN	NORTHERN	NORTH-EASTERN	SOUTHERN
• Chanthaburi	• Chiang Mai	• Khon Kaen	• Chumphon
• Chonburi	• Chiang Rai	• Mukdaharn	• Hat Yai
• Kabinburi	• Lampang	• Nakhon Ratchasima	• Phuket
• Rayong	• Nakhon Sawan	• Sakon Nakhon	• Pranburi
	• Phitsanulok	• Ubon Ratchathani	• Surat Thani
	• Tak	• Udon Thani	• Thung Song

WESTERN	CENTRAL
• Kanchanaburi	• Charoenpol
• Nakhon Pathom	• Laksi
• Samut Sakhon	• Saraburi

The first branch of the MTS Cat Rental Store opened at the end of 2002 in premises at Km 7 on the Bangna-Trad Road in Bangkok, followed at the rate of one per year by a site near Don Muang airport, Bangkok; Phuket; Chonburi; and Surat Thani.

SALES

Table 134. Metro Machinery Co. Ltd: Sales of Construction Equipment in Thailand by Type, 2012-2013 (Units)

	2012	2013
Articulated Dump Trucks	-	30
Backhoe Loaders	74	57
Compaction Equipment	40	35
Crawler Dozers	11	23
Crawler Excavators	855	680
Motor Graders	52	49
Rigid Dump Trucks	-	2
Skid-Steer Loaders	3	2
Wheeled Loaders	62	60

Note: All products from Caterpillar
Source: Off-Highway Research

Sales of crawler excavators accounted for 72 per cent of the new units retailed in 2013 and 78 per cent in 2012. The 20 tonne 320 model accounts for around 85 per

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cent of the company's total excavator sales whilst the smaller 312 model has assumed increasing importance in the growing midi sector. The excavators are sourced from Caterpillar plants in Japan and China and, despite a high degree of brand loyalty, the company has been unable to surpass the retail volumes achieved by the two domestic producers Komatsu and Kobelco.

In other, smaller volume markets, Metro has high market shares, in particular motor graders and crawler dozers. It also has a strong presence in large wheeled loaders where its 200 horsepower 950 and 270 horsepower 966 models have recorded notable success in the quarry sector. Mining shovels represent a highly profitable line of business for Metro, although more recently it has lost market share to Komatsu.

FUTURE DEVELOPMENTS

Metro Machinery is the leading construction equipment dealer in Thailand with an extensive after sales support network that ensures it retains an extremely high level of customer loyalty. It is therefore well placed to take advantage of the large number of major infrastructure projects forecast to take place in the country in the medium to long term. Although the market in neighbouring Laos has declined during the last 18 months, Metro's Lao subsidiary has already achieved a significant volume of new business during the last five years, particularly for heavy machinery such as mining excavators, dump trucks, crawler dozers and motor graders. Many large-scale hydroelectric dam projects are also currently underway or in the consultation phase and represent huge future potential for construction machinery, which Metro will be keen to exploit.

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PARAGON MACHINERY

Address	**Paragon Machinery Co. Ltd** 473 Muangthongthani Bond Street Rd. Bangpood Pakkred Nonthaburi 11120
Tel	+66 (0)2 960 2090-2
Website	www.paragonmach.com
Ownership and Formation	Paragon Machinery was founded in 1991 and incorporated as a private limited company in 1992. It began as an OEM spare parts supplier for the construction equipment sector and subsequently began to import parts of a greater variety and quantity from original equipment manufacturers and replacement parts distributors in the USA, Europe, Korea and Japan. Today it is the largest stockist of heavy equipment spare parts in Thailand and distributes approximately 500,000 line items for over 70 brands of products in the agricultural, marine, forestry, industrial, construction and mining industries. It also has a factory joint venture in China and an assembly plant in South Korea. In 2007 it became the official importer for Titan, the German manufacturer of construction equipment undercarriages, and subsequently diversified into sales of new machinery. In 2010 it became the authorised distributor for BEML, the Indian dump truck manufacturer and in the same year secured a Thai government tender order for 21 100 tonne rigid dump trucks, for delivery to the Mae Moh lignite mine in Lampang province. During the last two years the company has expanded rapidly and has taken on a further five major equipment franchises.
Employees	150.
Key Personnel	Mr Peerapong, Owner and CEO, Kritspon Bumrungphon, Marketing Manager
Turnover	THB700 million.

Source: Company Information

FRANCHISES

Table 135. Paragon Machinery : Range of Construction Equipment Franchises, 2014

Company	Products
BEML	Rigid dump trucks
Çukurova	Backhoe loaders, forklift trucks
FAW	On-highway trucks
Foton	Wheeled loaders
Liebherr	Earthmoving machinery
Sandvik	Crawler drills

Source: Company Information

Paragon was appointed as the official **Liebherr** earthmoving machinery dealer for Thailand in 2014, taking over from the previous dealer Uawithya. Business is conducted with the manufacturer via the Liebherr Singapore subsidiary, and not through the Liebherr Thailand subsidiary in Samutprakarn. Paragon focuses on crawler excavators and wheeled loaders sourced from Liebherr factories in China and Europe, although it also promotes the dump truck and mining shovel product ranges. It specifically targets high utilisation end-user segments such as quarries, mines and some industrial applications, which are prepared to pay a premium for the quality and durability of Liebherr machines, and which appreciate the cost

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saving benefits of lower fuel consumption engines. Paragon has also recently sold two Liebherr material handling excavators to a Swiss company operating in Thailand.

The Turkish **Çukurova** backhoe loader and forklift truck franchise was taken on in 2011. The **BEML** franchise has already yielded a substantial rigid dump truck order from the Electricity Generating Authority of Thailand (EGAT), which incorporates a 10 year service contract. **Foton** wheeled loaders from China enable the dealer to compete in a sector dominated by Chinese suppliers and have yielded a small but steady volume of annual sales.

OUTLETS

The company's head office is located in the Pakkred district of Nonthaburi province, directly northwest of Bangkok. There is a central service depot in Wang Noi and office and central parts stock in Lampang. It also operates an additional three warehouses for the spare parts business. Currently, a new 9,000 m^2 office complex and service centre are being built in Chonburi which are due to open later this year.

SALES

Table 136. Paragon Machinery: Sales of Construction Equipment in Thailand by Type, 2012-2013 (Units)

	2012	2013
Backhoe Loaders – Çukurova	15	15
Wheeled Loaders – Foton	15	15

Source: Off-Highway Research

FUTURE DEVELOPMENTS

The company's immediate strategy is to expand the Liebherr, BEML and Sandvik business lines in the quarry and mining sectors. It has set itself the target of increasing turnover in 2014 to THB1,000 million. In the medium term Paragon is keen to grow the business beyond Thailand's borders into Myanmar, Laos and Cambodia.

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SIAM KUBOTA

Address	**Siam Kubota Corporation Co. Ltd** 101/19-24 Moo 20 Navanakorn Khlongneung Khlongluan Pathumthani 12120
Tel	+66 (0)2 909 0300
Website	www.siamkubota.co.th
Ownership and Formation	The company was originally founded in 1978 as The Siam Kubota Industry Co. Ltd, and is a manufacturing business and the marketing organisation for Kubota engines and farm machinery in Thailand. The company has two plants; the original factory and company headquarters is in Pathumthani, near Bangkok, where it makes small diesel engines, power tillers and walk behind rice reapers on a site covering 78,860 m2. It celebrated 25 years of diesel engine production in Thailand in 2003, having made over two million units. The current output is around 70,000 engines per year. Kubota dominates the market for small engines in rural applications in Thailand, although there is also production of similar units by Yanmar and Mitsubishi in the country. In September 2007 the company established a new manufacturing venture, Siam Kubota Tractor Co. Ltd, at the huge Amata Nakorn industrial estate in Chonburi to assemble tractors locally. Annual capacity at the plant is 50,000 units and production encompasses three compact tractor models rated at 20, 30 and 50 horsepower, transmissions and, with effect from 2011, rice harvesters. The factory employs 1,500 people and exports around 20 per cent of tractor production to Cambodia, Laos, Myanmar, India, Vietnam, Middle East, Africa, Australia and the USA. In August 2010 The Siam Kubota Industry Co. Ltd merged with Siam Kubota Tractor Co. Ltd to become Siam Kubota Corporation Co. Ltd. The new company was established with a registered capital of THB3,114 million and is a joint venture between Kubota Corporation of Japan, which holds a 60 per cent shareholding, and Siam Cement Group, which has a 40 per cent shareholding.
Employees	A total of 2,700 people are employed at the Chonburi and Pathumthani plants, including marketing and service support personnel.
Key Personnel	Saito Sonoe, President; Chamornwut Tamnarnchit, Marketing Manager

Source: Company Information

FRANCHISES

Table 137. Siam Kubota Co. Ltd: Range of Franchises, 2014

Company	Products
Kubota	Engines, farm machinery

Source: Company Information

The company originally sold standard export specification tractors from Japan in the 45 and 80-90 horsepower sectors in the 1990s. They were not a success and it subsequently changed to launch a much more potent range of six basic specification models from 24 horsepower upwards with much lower selling prices. 24, 28 and 34 horsepower types appeared between 2004 and 2006, to be followed by others up to 100 horsepower in 2006-2007. The Amata Nakorn plant produces all models below 50 horsepower, with the larger machines up to 135 horsepower being imported from Japan.

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OUTLETS

The company distributes its products through the central headquarters and a network of over 200 authorised dealers covering the whole country. In addition, there are 44 dedicated Siam Kubota service centres and 40 Siam Kubota Leasing Company offices throughout the country.

SALES

Kubota dominates the market for under 50 horsepower four wheel agricultural tractors and is estimated to have a market share of over 80 per cent. Its range of larger tractors is also now challenging John Deere and New Holland.

The success of the B24 and L36 models has been phenomenal. Besides convincing power tiller users to upgrade to a wheel tractor with draft control, Kubota has also destroyed part of the market for used tractors (paradoxically many from Japan) and even had requests from used tractor importers to become Kubota dealers. In 2006 the company founded a formal leasing company, Siam Kubota Leasing Co. Ltd and undeniably the success of the tractor programme has been linked to super flexible payment terms since 2004.

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SIAM MOTOR PARTS

Address	**Siam Motor Parts Co. Ltd** 127 Chaloem Phrakiat Ratchakan Thi 9 Rd Kwang Dokmai Khet Prawet Bangkok 10260
Tel	+66 (0)2 726 8065; 726 8981-2
Website	www.smparts.co.th
Ownership and Formation	Siam Motor Parts is one of 50 companies in the Siam Motors Group, one the leading private enterprises of Thailand. The origin lies in the Siam Motor Co. established in 1952 by Dr. Thaworn Phornprapha to distribute Nissan cars in Thailand, the first sales outside Japan for the company. Although the founder died in 2001 the group is still a family enterprise and, with Nissan vehicles and parts as its main products, it has 50 subsidiaries spanning manufacturing, trading, and tourism and education businesses. Heavy machinery, air-conditioners, elevators and escalators are its other key products. The group first took on the representation of JCB in Thailand in 1975, and for the next 17 years it lived alongside the Komatsu construction equipment in the Heavy Earthmoving division of Bangkok Motor Works. Then from 1992 to 2001 the JCB franchise was grouped with all the group's industrial products into a subsidiary known as Bangkok Machinery and Parts. In 2001 it was moved into the parts company, Siam Motor Parts Co. Ltd, which has been active in the motor parts market since 1989.
Employees	Out of the 250 employees, approximately 70 work in support of the JCB franchise.
Key Personnel	Thee Sripawatakul, General Manager, Supatchara Na Nagara, General Manager JCB Sales (BKK) Machinery Division

Source: Company Information

FRANCHISES

The successful part of the JCB franchise is the backhoe loaders, which are sold predominantly to the public sector, but also to rental companies and private contractors. Other products sell in much smaller volumes, although Siam Motor Parts is keen to establish a greater presence in the crawler excavator and compaction equipment sectors.

Table 138. Siam Motor Parts Co. Ltd: Range of Franchises, 2014

Company	Products
CompAir	Mobile compressors
JCB	Construction equipment

Source: Company Information

OUTLETS

The main service centre is at Khet Prawet, outside Bangkok. It has a warehouse of 4,500 m^2 and offices of 2,106 m^2. There are additional company branches in Rayong, Surat Thani, Chiang Mai, Khonkaen and Nakhon Ratchasima. In 2014 it will open new branches in Udon Thani and Phitsanulok.

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SALES

Table 139. Siam Motor Parts Co. Ltd: Sales of Construction Equipment in Thailand by Type, 2012-2013 (Units)

	2012	2013
Backhoe Loaders	130	173
Compaction Equipment	3	5
Crawler Excavators	23	43
Mini Excavators	-	20
Telehandlers	-	2

Source: Off-Highway Research

JCB has come to dominate the backhoe loader market in recent years and Siam Motor Parts regularly achieves as much as 60-70 per cent market share. It markets them mainly to the municipalities doing maintenance throughout the country, but increasingly to rental companies and private contractors. The wealthier government buying departments favour the 92 horsepower 3CX Super model with equal sized wheels and this machine typically accounts for 50 per cent of the company's annual backhoe loader sales. The 3CX 4WD model is the second most popular model and is favoured by the private contractor sector, whilst the 2WD version is sold in smaller quantities to rental companies. Sales of the more expensive 4CX have now effectively been superseded by the cheaper 3CX Super. Extendable booms are rarely specified due to cost considerations, except for machines sold to irrigation applications. There is only very occasional demand for the compact 2CX or 1CX models.

Attempts to promote the JS200 crawler excavators are inevitably hindered by intense competition from the established Japanese suppliers and a similar situation prevails in the single drum soil compactor sector where the VM115 model, sourced from JCB's Indian factory, has sold in limited quantities thus far. The 531-70 telehandler continues to record an incremental volume of sales, whilst the dealer has begun to promote mini excavators, 20 units of which were sold in 2013.

FUTURE DEVELOPMENTS

The company will continue to strive hard to increase its presence in the 20 tonne crawler excavator sector where its past performance has been poor. Volumes remain low in comparison to the established suppliers, although some progress has been made. Attempts to promote the Vibromax soil compactors more aggressively have been less successful. The rapid growth in the mini excavator sector has encouraged SMP to begin marketing the JCB product range more actively and it has already secured a promising level of new orders.

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SN MACHINERY

Address	**SN Machinery & Equipment LP** 159/28 Moo 3 Vibhavadi Rangsit Road Talad Bangkaen Laksi Bangkok 10210
Tel	+66 (0)2 900 5384/5
Website	www.smparts.co.th
Ownership and Formation	In 1994 two families with long experience in the construction machinery business founded Thai Sakai in conjunction with Sakai of Japan. The Laorphanphol family owned 55 per cent of the capital and when it closed in 2003 the franchise was split between two companies, Dmap Road Machinery and SN Machinery, each of which is run by sons of the original company's founder.
Employees	22 people work in SN Machinery
Key Personnel	Nutthanun Laorphanphol, Manager
Turnover	THB200 million.

Source: Company Information

FRANCHISES

Both dealers market the complete Sakai range, although in the important soil compactor sector only the SV520 series models are imported from the Sakai plant in Indonesia. As a sideline to the Sakai compaction equipment business, SN also sells used Sumitomo asphalt finishers.

Table 140. SN Machinery: Range of Franchises, 2014

Company	Products
Sakai	Full range of road making equipment

Source: Company Information

OUTLETS

Sales, service and spare parts facilities are all controlled from small premises on the main road to the former Bangkok airport.

SALES

Table 141. SN Machinery and Dmap Road Machinery: Sales of Construction Equipment in Thailand, 2012-2013 (Units)

	2012	2013
Compaction Equipment – Sakai	123	115

Source: Off-Highway Research

Sakai is the market leader in compaction equipment and has over 60 per cent or more of the vital earth roller sector. It is also the most frequently seen manufacturer among the used compactors imported from Japan, which helps the company in its own used construction equipment business as well as generating some parts income. SN sells up to 98 per cent of its new machines to private contractors since government departments increasingly buy new compactors on the so-called e-auctions on the internet. Approximately 80 per cent of the company's sales in

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Thailand are of soil compactors since the tandem rollers produced in Japan are deemed too expensive for the domestic market. Interestingly, SN has managed to sell four new Sakai pneumatic-tyred rollers in 2013 and two static rollers in 2012 to the Thai government, a rare feat given the dominance of used machines in these sectors.

The recent appointment of official Sakai dealers in Myanmar, Laos and Cambodia means SN Machinery no longer exports Sakai machines to these markets.

FUTURE DEVELOPMENTS

The decision to move the source of the soil rollers to Indonesia has been the key to greater success and gives the company the chance to challenge the auction companies as well as winning tenders.

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THAIYONT

Address	**Thaiyont Equipment Co. Ltd** 70/17 Vibhavadi Rangsit Road Sanambin Donmuang Bangkok 10210
Tel	+66 (0)2 996 6100
Website	www.thaiyontequipment.com
Ownership and Formation	Thaiyont Tractor Co. Ltd was established in Bangkok 30 years ago by Mr Kasem Ariyavuthipan as an importer for used construction equipment from Japan. In 2011 it became the official Sany dealer for the Chinese manufacturer's range of construction equipment and established a separate subsidiary company, Thaiyont Equipment Co. Ltd, to administer this side of the business. Thaiyont Equipment is owned by Mr Kasem's daughter. Sany's range of truck-mounted, all terrain, rough terrain and crawler cranes is marketed by another independent dealer, Max Crane Machinery Co. Ltd, based in Samutprakarn. Sany concrete equipment is marketed by the Thai Sun organisation. Sany established its own subsidiary company, Sany Industry Thailand Ltd, in Bangkok in 2009 in recognition of the Thai market's increasing importance. The company comes under the jurisdiction of the Sany Asia Pacific Region business unit and is intended to serve as the central headquarters for the manufacturer's activities in the Southeast Asia region. The manufacturer is currently preparing to establish a joint venture company with Thaiyont Equipment, to be known as Sany Thaiyont, in order to support the dealer's operations and to expand its business in Thailand.
Employees	50 people work in the Thaiyont Equipment; 100 people are employed in Thaiyont Tractor.
Key Personnel	Kasem Ariyavuthipan, President (Thaiyont Tractor Co. Ltd), Yotsawat Ruangraklikhit, Managing Director (Thaiyont Equipment Co. Ltd), Narongchai Isariyachai, General Manager (Thaiyont Equipment Co. Ltd)

Source: Company Information

FRANCHISES

Table 142. Thaiyont Equipment Co. Ltd: Range of Construction Equipment Franchises, 2014

Company	Products
Sany	Earthmoving equipment

Source: Company Information

Thaiyont currently focuses on the crawler excavator sector, although sales of motor graders and soil compactors have also been made. The imminent formation of the joint venture company will eventually see the dealer begin to market more products within the Sany earthmoving equipment range, including wheeled loaders, crawler dozers, rigid dump trucks, backhoe loaders and asphalt finishers.

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OUTLETS

The company's headquarters is in the Don Muang district of Bangkok. It is currently planning to build five new sales and service depots in the North, South, Central, West and Northeast regions of the country.

SALES

Table 143. Thaiyont Equipment Co. Ltd: Sales of Construction Equipment in Thailand by Type, 2012-2013 (Units)

	2012	2013
Crawler Excavators	106	177
Motor Graders	-	15

Source: Off-Highway Research

In 2013 Thaiyont secured a large order from one of Thailand's largest construction companies, Unique Engineering and Construction PCL, for 90 crawler excavators and 15 motor graders. Many of the new machines have been put to use on the high publicity Bang Sue Mass Rapid Transit System project in Bangkok.

FUTURE DEVELOPMENTS

The imminent formation of a new joint venture company between Thaiyont Equipment and Sany should enable the dealer to exploit the forecast growth in the construction equipment market once government funds for planned infrastructure projects are released. The expansion of the product portfolio in the medium term will also allow Thaiyont to target a much wider variety of end-user sectors.

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UAWITHYA MACHINERY

Address	**Uawithya Machinery Co. Ltd** 457, 383/73-74, 383/80-81 Chakrapadipong Rd Khlong Maharnak Pomprap Bangkok 10100
Tel	+66 (0)2 223 0153
Website	www.uawithya.com
Ownership and Formation	Uawithya began more than 100 years ago as a trading company and in 1935 the head of the company bought a quarry in Saraburi. By this route it became a manufacturer of explosives in 1974 and a supplier of equipment to fellow quarry owners. The machinery company dates back to 1968, originally formed to import explosives. For a long time it has sold Furukawa drills but in 2002 it began a widening of its range by taking on the Liebherr earthmoving equipment franchise, with a view to selling the larger excavators and wheeled loaders to quarries. It also held the distribution rights for Terex dump trucks from Scotland, although subsequently relinquished the franchise.
Employees	The trading company employs around 150 people, of whom 60 work on customer support. The explosives factory employs around 60 people.
Key Personnel	Kejkanoek Uawithya, Managing Director, Navapol Uawithya, Vice President, Sales
Turnover	US$50-60 million.

Source: Company Information

FRANCHISES

Table 144. Uawithya Machinery Co. Ltd: Range of Franchises, 2014

Company	Products
Furukawa	Drills
Metso Minerals	Crushers
Pewag	Tyre chains
Rammer/Sandvik	Hammers

Source: Company Information

Uawithya's main focus is now the Furukawa drilling equipment and Metso Minerals crushing equipment franchises. Although the Liebherr earthmoving equipment franchise was transferred to Paragon Machinery in 2013, Uawithya will continue to offer service support to its existing customers in Thailand. The company sold a total of around 50 Liebherr excavators to quarries in Thailand and achieved a market share of 20-25 per cent in the 30-40 tonne class, helping to establish the German manufacturer's reputation for advanced technology machines.

OUTLETS

The Bangkok centre is essentially a minor part of the operation, as the company's business is to service quarries spread all over the country. The branches are in:

- Bangkok
- Chonburi
- Hat Yai
- Lampang
- Saraburi
- Surat Thani
- Surin
- Tungsong
- Udon Thani
- Utong

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SALES

The company sold one Liebherr crawler excavator in 2012. It claims a market share in rock drills of 90 per cent and it has over 200 units installed in the country. It has also sold over 150 Metso crushers in 12 years.

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WIRTGEN THAILAND

Address	**Wirtgen (Thailand) Co. Ltd** 80/1 Moo 2 Bangna-Trad Road Rachatheva Bangplee Samutprakarn 10540
Tel	+66 (0)2 750 2908
Website	www.wirtgen.co.th
Ownership and Formation	The company is a subsidiary of the Wirtgen Group of Germany and was formed in 2000, two years after the opening of a representative office of the manufacturer in Bangkok. As importers' contracts with different parts of the group expired, the subsidiary took over the representation in Thailand.
Employees	25
Key Personnel	Ellison Sim, Managing Director

Source: Company Information

FRANCHISES

Table 145. Wirtgen (Thailand) Co. Ltd: Range of Franchises, 2014

Company	Products
Hamm	Compaction equipment
Kleemann	Crushers
Vögele	Asphalt finishers
Wirtgen	Road recycling and associated machinery

Source: Company Information

The distributor contract of Vasko for **Vögele** pavers expired in 1998 and Wirtgen Thailand immediately took over. In the case of **Hamm** compaction equipment the transfer was a little more complicated, in that the previous importer, Asada Equipment, went under in the 1997 crisis, survived for a while and then closed in 2000, when Wirtgen took over fully.

The company's main line in Thailand is cold recycling units of very high value, far more valuable than the asphalt finishers and compaction equipment with which this report is concerned.

OUTLETS

In 2008 the company relocated from its original offices in the Kulab Building to a new 2,500 m² premises in Bangplee on the Bangna-Trad road. The move came as a result of the need for more space to cope with the growth in business and, importantly, integral workshop facilities. The company maintains a small number of cold planers, usually located in the Bangkok region, to assist customers whose machines are out of commission temporarily.

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SALES

Table 146. Wirtgen (Thailand) Co. Ltd: Sales of Construction Equipment in Thailand by Type, 2012-2013 (Units)

	2012	2013
Asphalt Finishers – Vögele	9	3
Single Drum Soil Rollers – Hamm	14	20
Tandem Asphalt Rollers – Hamm	19	9

Source: Off-Highway Research

Wirtgen Thailand is the acknowledged market leader in asphalt finishers and sells Vögele machines in both crawler and wheeled configuration, all of which are sourced from the company's manufacturing plant in Germany. The most popular models are the Super 1600, which is sold predominantly in city areas, and the more powerful Super 1800, which is sold mainly in northern Thailand where more demanding paving applications necessitate the use of larger machines. Wirtgen Thailand has also become the acknowledged market leader in the selling of used asphalt finishers, most of which it draws directly from the used equipment division at Vögele's Ludwigshafen plant in Germany.

In the compaction equipment the company sells mainly 10 tonne soil compactors, although occasionally sells 20 tonne machines as a package with the recycler units. Sales of Hamm machines have risen significantly during the last five years, and Wirtgen benefited particularly from the government's Thai Khem Khaeng stimulus package implemented in 2010. Wirtgen only sells Hamm compactors made in Germany, and does not source any machines from the company's plant in India. It also buys high specification ex-demo machines directly from Hamm's Tirschenreuth factory in Germany, which are sold in Thailand with full warranties.

FUTURE DEVELOPMENTS

Whilst much of the company's focus is applied to the highly profitable Wirtgen recycling machinery, in the medium to long term it would like to grow the Vögele and Hamm business. There has been an increasing trend in the last three years towards buying new pavers rather than imported used machines from Japan. Much of this is attributable to increasingly stringent road building specifications laid down by the Department of Highways, which necessitate the use of high technology pavers, a development that Wirtgen will be keen to exploit.

The company is also keen to build on its success in the used paver market, currently estimated to be around 20-30 units per year, where it has acquired an increasingly large share of the business due to the fact that prices of imported used pavers from Japan have risen sharply in recent times. Furthermore, contractors are increasingly familiar with the quality and longevity of Vögele machines, which are acknowledged to be superior to that of their Japanese equivalents. Wirtgen has the advantage of having its own specialised workshop to refurbish the machines and to support the used paver business. Importantly, this means having the ability to

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supply genuine spare parts, a major selling point for customers, several of whom have had bad experiences with fake parts fitted to competitors' used products.

The expanding level of business in recent years has encouraged the company to invest in new, larger and more conveniently located premises, which are scheduled to open in early 2015.

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YANMAR AGRICULTURAL MACHINERY

Address	**Yanmar Agricultural Machinery (Thailand) Co. Ltd** Lad Krabang Industrial Estate 109 Moo 9 Chalong Krung Road Lad Krabang Bangkok 10520
Tel	+66 (0)2 326 0700
Website	www.yanmar.co.th
Ownership and Formation	Founded in 2004, Yanmar Agricultural Machinery is an offshoot of the mature engine business of Yanmar in Thailand. Yanmar has been selling its engines, especially the single cylinder horizontal engine, here for more than 45 years. In 1978 it formed a company with others to build a manufacturing plant in Lad Krabang, near Bangkok. The plant and headquarters at Lad Krabang are on a site covering 82,000 m2, with a covered area of 10,080 m2. The current output is around 40,000 engines per year, with a capacity of 54,000. In February 2011 the company built a new assembly plant for compact tractors on the site of the existing factory in Lad Krabang. The new facility was conceived in recognition of the importance of the expanding Thai market and has an annual production capacity of 15,000 units. The combined workforce in both plants is 650 people. Yanmar Agricultural Equipment (Thailand) Co. Ltd is a holding company shared between Yanmar Agricultural Equipment Japan and Nippon Equipment. It started operations in November 2004.
Key Personnel	Mr S. Nakamitsu, President

Source: Company Information

FRANCHISES

Table 147. Yanmar Agricultural Machinery (Thailand) Co. Ltd: Range of Franchises, 2014

Company	Products
Yanmar	Farm machinery

Source: Company Information

For many years Yanmar was uninterested in competing in the agricultural tractor market, as it was unable to offer anything low enough in price to suit the depressed state of tractor sales as the new millennium dawned. The company knew very well that most small cultivation was done with power tillers and that small tractors had almost no place.

The example of Kubota in changing the market has been a spur to action in Yanmar but it has not followed that competitor in offering simpler or less up to date tractors. Instead it has launched a small number of models from 20 to 45 horsepower with full equipment such as synchromesh and draft control. The company also markets rice combine harvesters from Japan.

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OUTLETS

The company distributes its products through a central headquarters at Ratchathewa, Bangkok and a network of 40 authorised dealers covering the whole country.

SALES

The company is not chasing the success of the Kubota tractors but rather offering an authentic Japanese tractor with an 8x8 synchromesh gearbox. The distribution is based on the engine dealer network and those engines are ubiquitous in Thailand. It is also convincing power tiller users to upgrade to a wheel tractor with draft control but does not offer quite the super flexible payment terms that its rival does. It has managed to sell more than 5,000 units in 2013 and won over 20 per cent of the under 50 horsepower market.

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YONTRAKARN MACHINERY

Address	**Yontrakarn Machinery Co. Ltd** 71 Moo 8 Chiengraknoi Bangpa-in Ayutthaya 13180
Tel	+66 (0)35 219 167-70
Website	www.ytkmachinery.com
Ownership and Formation	Yontrakarn Machinery Co. Ltd is a family owned company, founded in 1989 by Mr. Sujin Pruitthithada and Mrs. Mukda Pruitthithada as a dealer for used construction and agricultural equipment. Currently, Yontrakarn Machinery Co. Ltd is registered with fully paid capital of THB550 million. Recognising a developing trend among Thai contractors towards buying new Chinese machinery, in particular wheeled loaders, in preference to increasingly scarce and expensive used equipment from Japan, Yontrakarn took the decision to take on the LiuGong franchise in 2010. The company had previously been a sub-dealer for Komatsu crawler excavators for some five years.
Key Personnel	Kittichai Pruitthithada, General Manager
Employees	100
Turnover	THB1,000 million.

FRANCHISES

In addition to the LiuGong franchise, Yontrakarn also markets Okada breakers for hydraulic excavators.

Table 148. Yontrakarn Machinery Co. Ltd: Range of Construction Equipment Franchises, 2014

Company	Products
LiuGong	Construction equipment
Okada	Hydraulic breakers

Source: Company Information

OUTLETS

The central headquarters is located in Ayutthaya, around 60 kilometres north of Bangkok. There are an additional five branches throughout the country.

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SALES 2012-2013

Table 149. Yontrakarn Machinery Co. Ltd: Sales of Construction Equipment in Thailand by Type, 2012-2013 (Units)

	2012	2013
Crawler Excavators	40	100
Motor Graders	-	5
Soil Compactors	-	8
Wheeled Loaders	250	300

Source: Off-Highway Research

Yontrakarn is the dominant market leader in the wheeled loader sector with the LiuGong product. Much of its success is attributable to the high volume of business achieved in the rice milling and handling industry, which in 2013 accounted for some 70 per cent of sales. Crawler excavators have assumed increasing importance whilst graders and soil compactors constitute an incremental volume of new business. Yontrakarn does not currently market the LiuGong range of backhoe loaders.

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