Building India’s Earthmoving and Construction Equipment Industry

India’s infrastructure spending could result in a $16 billion to $21 billion ECE industry by 2020.
Acknowledgements

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Foreword

India's earthmoving and construction equipment (ECE) industry has witnessed healthy growth over the past decade; however, market conditions have become tougher recently. Despite the short-term challenge, we believe the ECE industry’s long-term prospects are solid, and we expect to see renewed growth in the next few years.

Infrastructure demand is the primary factor driving ECE growth, and India's need for new infrastructure is substantial. The government’s intention to support infrastructure development is outlined in the Twelfth Five-Year Plan (FYP) and in the recent Union Budget announcement. As a result, infrastructure spending is expected to grow from 7.2 percent of GDP in 2012 to 9 percent by 2017. This is likely to spur the demand for ECE, and the result could be a $16 billion to $21 billion industry by 2020.

This significant opportunity raises some important questions regarding the current low adoption and usage of ECE for construction activities in India: What additional benefits can be derived from increased usage of ECE? What challenges need to be overcome for the ECE industry to realize its potential? What key interventions from the government and ECE original equipment manufacturers (OEMs) can help address these challenges?

To answer these questions, A.T. Kearney and the Indian Construction Equipment Manufacturers’ Association (ICEMA) conducted a joint study to identify the industry’s challenges and assess potential ways to overcome them. The study also explored some of the best practices for the ECE industry globally and assessed potential solutions. The findings are presented in this report, which draws on A.T. Kearney’s worldwide industry expertise and intellectual capital. Experts across the ECE value chain have also contributed valuable insights.

Amit Gossain, president, Indian Construction Equipment Manufacturers’ Association

Manish Mathur, partner, A.T. Kearney
Outlook for Infrastructure Development in India

The overall slowdown in the economy has taken a toll on infrastructure investments in India. Across different segments, infrastructure availability is relatively low compared to many countries. To address this issue, the government has set ambitious targets as part of the ongoing Twelfth FYP (FY12–FY17), proposing INR 56 lakh crores of investment in infrastructure. These targets are heavily weighted toward the second half of the plan, with 52 percent of total investment expected in the last two years of the plan period.

In addition, the Union Budget of the new government has earmarked INR 2 lakh crores for investment in infrastructure. The investments are allocated for a broad range of infrastructure projects including roads, airports, rural infrastructure, and urban infrastructure. Highlights for some of these plans are outlined below.

The Indian government plans to build **200 low-cost airports in the next 20 years to connect** tier 1 and tier 3 cities.

**Roads**

The FYP lays out an aggressive scheme for road network development—approximately INR 9.15 lakh crores of investment is planned over the five-year period. An investment of INR 37,880 crores in National Highways Authority of India (NHAI) and state roads is proposed in the new government’s Union Budget, including INR 3,000 crores for the northeastern region. Further, INR 14,389 crores has been earmarked for the improvement and construction of rural roads through the Pradhan Mantri Grameen Sadak Yojana (PMGSY) program. The government also plans to initiate work on selected expressways, in parallel with the development of industrial corridors.

**Airports**

Airport improvements are also planned, with INR 88,000 crores of development earmarked during the ongoing FYP period to cater to the expected doubling of passenger- and cargo-carrying capacity in the same period. According to the announcements in the Union Budget FY14–15, the government will launch a scheme for the development of new airports in tier 2 and tier 3 cities through public-private partnerships. They will also put forward plans to build 200 low-cost airports in the next 20 years to connect tier 1 and tier 3 cities.

**Irrigation**

The government also plans to invest INR 5 lakh crores in irrigation during the FYP period to realize its target of increasing the gross irrigated area for India by 13 million hectares. The Union Budget earmarked an investment of INR 1,000 crores to create infrastructure for the rural irrigation scheme known as Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), which is aimed at guaranteeing water to farmers. A large-scale river-linking project has also been announced, and the government has set aside INR 100 crores to fund a detailed study.
Urban infrastructure

Urbanization is a priority in the Union Budget, which outlines planned investments in many different areas of urban infrastructure development:

- A total of INR 50,000 crores has been allocated for urban infrastructure projects.
- Development of 100 smart cities as satellite towns of larger cities and modernization of existing midsize cities. A sum of INR 7,060 crores in the current fiscal year will be allotted to provide the necessary support.
- Metro rail projects are planned for cities with populations greater than 20 lakh; Lucknow and Ahmedabad are slated to receive metro trains, with INR 100 crores allotted.
- Seven industrial cities will be developed.

Infrastructure development is one of the primary growth engines for the economy and has been identified as a top priority by the current government. However, the timely execution of large-scale projects will be crucial to reviving interest and investment in this area. If the proposed infrastructure plans materialize, the impact on ECE industry sales will be significant and positive.

Overview of ECE Industry in India

In India, the ECE market is expected to grow at a healthy CAGR of 20 to 25 percent over the next few years, from FY13–14 levels of about 48,000 units. This would bring the market to between $16 billion and $21 billion by 2020, up from today’s $3 billion. Nevertheless, India’s ECE market is still underdeveloped: ECE penetration of the construction industry is relatively low compared to other countries, indicating there is significant room for growth (see figure 1).

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Figure 1
**ECE penetration in India is low**

($ billion)

United States | 601 | 6% | 5%
---|---|---|---
China | 688 | 4% | 28
Brazil | 108 | 6% | 30
India | 155 | 2% | 6

Note: ECE is earthmoving and construction equipment.
Source: A.T. Kearney analysis
Two primary factors that will help the ECE industry achieve its potential for growth are the increase in demand from end-user industries and higher adoption of ECE in traditional construction applications. However, to meet its unrealized potential, the industry will need to address some tough challenges. Best practices from other countries, as well as from successful domestic projects, offer ways to increase ECE adoption by construction companies. But ultimately success will depend on close collaboration between government and ECE OEMs, to clear away some of the roadblocks.

**Benefits of Using ECE**

Industry growth will primarily arise as a result of higher adoption of ECE in traditional construction applications. The use of ECE will not only propel the end-user industries of construction and mining forward but also create demand for ECE in new construction applications. There are clear advantages to using ECE versus manual labor and low-end technology for construction applications, and it is important for industry executives to identify and communicate these benefits to customers.

**Quality improvement**

Among the most significant criteria for evaluating a construction company’s performance are the reliability and quality of the construction. Using construction equipment in complex and heavy construction activities will significantly improve both these measures. Employing construction equipment as opposed to manual labor will allow contractors to complete work with minimal quality defects, shielding them from claims arising from poor workmanship. Because many more construction contracts in India today include a defects liability clause, it will be to construction companies’ advantage to increase their usage of ECE for construction activities.

Offering higher-quality construction output will also provide end users with an inherent advantage over their peers and improve their reputation for reliability.

**Project efficiency**

Construction equipment overcomes many of the limitations associated with manual labor, from its inconsistency—due to weather, attendance, health, socioeconomic conditions, and a variety of other factors—to the time it takes to complete projects; construction equipment can reduce a project’s completion time significantly. For example, using basic equipment for mixing can produce around 18 cubic meters of concrete per hour versus manual concrete mixing which averages about 20 cubic meters of concrete over the course of an entire day.

By completing work more quickly, contractors can redeploy equipment to other projects, reducing downtime and achieving better returns.

**Cost savings and profitability**

Increased productivity and the reliability of construction equipment ultimately translates into higher profitability from fewer defect-related claims and the avoidance of delay penalties. In addition, using construction equipment can significantly reduce the cost of large-scale projects. It also allows for proper planning of work schedules, making it easier for companies to complete their projects within budget at a reduced overall cost.
Safety

Any construction site is the locus of multiple high-risk activities. There are obvious safety concerns associated with workers operating on the ground, particularly within confined spaces when heavy material is being moved around. Furthermore, exposure to severe weather conditions over long periods of time can subject workers to serious health risks. Using ECE for construction activities (particularly for dangerous tasks or in hazardous environments) helps mitigate or even prevent much of this risk. Assured of better safety, construction workers can perform their jobs more effectively and efficiently.

Contractors with a better safety track record improve their profitability because they can avoid costs associated with accidents and labor compensation. They can also negotiate with insurance companies for better premium rates.

Challenges to Increasing ECE Usage in India

There are significant benefits to increasing the use of ECE, as illustrated in our three case studies, below and on pages 6 and 7. However, some key challenges have hindered increased adoption of ECE for construction activities in India.

Limited customer education on the benefits of ECE

Typical Indian buyers of ECE still rate cost as the primary criterion for their purchase decisions. Customer education is not always delivered by OEMs, who are ideally placed to communicate the benefits of ECE versus manual labor or low-end equipment. With the introduction of multi-purpose, complex, and specialized equipment to the Indian market, there is even greater need to knowledgeably communicate the benefits of new and improved features. Raising awareness in end users of the quality and reliability benefits offered by ECE will help broaden purchasing criteria beyond acquisition cost.

Marquette Interchange Project—Wisconsin’s Largest Construction Project

The Marquette Interchange Project was an ambitious and successful effort undertaken to improve the flow of traffic through Wisconsin’s largest metropolitan area, Milwaukee.

Key successes

- The four-year project was finished in August 2008—three months ahead of schedule
- Total project cost was just under $810 million—well below the projected $1 billion price tag
- The project had a near-perfect safety record with minimal casualties

Key reasons for success

The project involved the use of 46 cranes and 25 to 30 aerial lifts, making it the largest construction project in the state’s history at the time. Specific steps, starting from the demolition of ramp segments to the erection of individual 150,000-pound steel girders, were scheduled years in advance and completed using the appropriate ECE. With a proper project plan in place, nearly all the equipment was ordered far enough in advance to allow suppliers time to ramp up production and meet delivery deadlines. The equipment rental company involved with the project offered training to the construction company’s workforce on safe operation of the construction equipment. Finally, the versatility and multiple features of the construction equipment helped the construction company complete this complex project well ahead of schedule.
The importance of proper use and care of construction equipment is poorly understood by most end users, and often equipment is not maintained and operated in accordance with OEM instructions. As a result, OEMs are reluctant to offer buyback schemes, invest in reconditioning, or explore reselling options.

**Lack of a rental, leasing, and used-equipment market**

ECE rentals in India are only 7 to 8 percent of the total ECE market—much lower than other developed and emerging economies (see figure 2). Not only is India’s ECE rental market highly fragmented and underdeveloped, but players that operate off the books for cash transactions—offering lower rates and avoiding paying taxes—also have a dominant presence.

**Figure 2**

*India’s ECE rental market has significant room to grow*

<table>
<thead>
<tr>
<th>ECE rental penetration rate</th>
<th>80%</th>
<th>65%</th>
<th>35%</th>
<th>30%</th>
<th>12%</th>
<th>8%</th>
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<tbody>
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<td>Japan</td>
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Note: ECE is earthmoving and construction equipment.
Source: A.T. Kearney analysis

In addition, most contractors in India prefer owning equipment to renting it, which has slowed the evolution of the ECE rental market. The rationale for this preference is that long projects tend to run into delays, driving up the cost of renting. Tender prerequisites often include proof of ownership of equipment on the part of contractors, making renting less attractive. In addition, leased equipment is considered to be both a “good” and a “service” under Indian tax law. This makes leasing subject to dual taxation: value-added tax (VAT) and service tax. Renting equipment is also difficult because there is no formal trading platform for used equipment. A lack of national registration procedures for ECE makes it difficult to determine residual value, further hindering the growth of the used equipment market.

**Lack of execution discipline and government support**

The majority of construction projects in India are awarded to the lowest bidder. Given the limited focus on other criteria such as quality of construction, timeliness, and safety commitment, contractors—especially small contractors—do not see the point of investing in the latest technologies or purchasing high-end equipment. Because there is very little procedural discipline, and quality checks are intermittent at best, contractors opt for the least expensive route, employing manual labor and using only low-end or even obsolete
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Unlike governments in most developed nations, the Indian government does not mandate the use of construction equipment in projects.

Another roadblock to ECE adoption is the host of regulatory and taxation issues that prevent equipment operators from performing their work seamlessly. For example, because there is no national registration procedure, it is difficult to obtain an all-India permit, meaning interstate movement of construction equipment becomes a major challenge for large national operators. The problem is compounded by the different entry taxes, RTO (motor vehicle) taxes, octroi (local entry taxes), and other taxes imposed by individual states.

In addition, the government has delayed the release of funds for approved infrastructure projects pending various policy decisions, which has adversely affected the liquidity of contractors and reduced the demand for ECE.

### Lack of skilled and trained manpower

Finding enough skilled manpower for the operation and maintenance of ECE is a major challenge for the construction equipment industry. By 2020, the ECE industry will need an estimated one-lakh trained operators and three-lakh trained mechanics to match its projected growth.

A lack of coordination among government agencies, OEMs, and construction companies has plagued efforts to create specialized skill development programs. ECE training institutes run by OEMs tend to be too expensive for most personnel seeking employment in this field. Cost is also an issue for technical training institutes, which have trouble affording the costly equipment needed for hands-on vocational training.

For the three-quarters of the construction industry comprised of small contractors, finding qualified workers is not even a priority. They prefer the lower-cost alternative of offering on-the-job training to their pool of unskilled operators and mechanics. The lack of national safety and quality guidelines for construction sites only encourages small contractors to make do with less-qualified workers.

### Poor uptime of construction equipment

ECE assets are subject to a high level of wear and tear, yet maintaining uptime is of the utmost importance to contractors. Unfortunately, a host of factors, including substandard maintenance, a scarcity of trained mechanics, and a lack of spare parts, adversely affect ECE uptime.

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**America's First End-Around Taxiway Airport**

At Atlanta’s Hartsfield-Jackson International Airport, the world’s busiest airport, the race to lay down 50,000 square yards of concrete paving for America’s first end-around taxiway was completed in a record 24 days, six days ahead of the 30-day deadline.

The contractor used sets of advanced two-track paving equipment to ensure timely completion of the project. When extensive security checks created delays in concrete delivery to the site, additional dump trucks were brought in to compensate. The trucks carried nine cubic yards of concrete and dumped it into a placer working in front of the two-track paver. A texture and cure machine was also used to follow behind the pavers for finishing purposes.

Construction of this end-around taxiway alongside the runway led to a 30 percent improvement in overall runway efficiency. The project was predicted to deliver an estimated $26 to $30 million in savings per year for the airlines.
These difficulties are reflected in the significant under-penetration of the after-sales market for ECE in India. After-sales service revenue for ECE OEMs in India is pegged at between 2 and 8 percent of their total revenue, compared to 12 to 20 percent for OEMs globally. Typically, equipment in India is used beyond its expected life span, indicating the huge growth potential for service and spare parts businesses.

The Indian ECE components and aggregates industry is facing its own set of challenges. High variability in OEM demand for components and aggregates makes capacity planning a challenge for suppliers. Poor distribution reach for spare parts, stiff margin pressures, and a technology gap are all problems that prevent the industry from addressing low ECE uptime.

Starting construction activities without all the requisite approvals and clearances inevitably leads to project delays, reducing ECE utilization and resulting in revenue loss for the contractors.

**Availability of financing**

Equipment financing in India is another challenging area. The Reserve Bank of India (RBI) has tightened its monetary policy, increasing the cost of borrowing for equipment financiers. As contractors struggle to bring in new projects and obtain timely payments for completed work, they have been forced to delay loan repayments. Both of these issues have led equipment-financing companies to either cut back their funding support or raise the interest rates they charge contractors.

While OEMs do offer limited financing options, most of them lack in-house financing arms and must therefore work through banks or non-banking financial companies (NBFCs). The payment terms offered for first-time customers are unfavorable, with shorter payback periods and higher installment amounts. This is particularly detrimental to industry growth prospects, since first-time ECE users make up about 30 percent of the overall customer base.

Many small construction players do not have proper access to institutional financing and are therefore dependent on NBFCs to meet their financing needs. However, due to a lack of adequate regulatory support, NBFCs do not operate on a level playing field when compared to banks and other financial institutions. For example, unlike banks, they are not empowered to move against defaulters, nor do they have access to debt recovery tribunals. This further increases the moral hazard among borrowers for willful defaults. The RBI’s recently announced revised framework for NBFCs, aligning their bad loan norms with those of banks, is not expected to kick in until March 2018.

**A World-Class Rainwater Harvesting Project**

The now-famous Shirpur model of rainwater harvesting has become something of a game-changer for India’s water conservation policies. The success of this project even led the government of Maharashtra to issue a resolution to replicate the Shirpur model throughout the state.

The project mostly involved cutting through acres of hard rock and digging deep into the parched earth using high-end excavators. The idea was to create 50-meter-deep ponds every 500 meters so that rainwater would be trapped and stored rather than washed away into the sea. The construction work began with two excavators; two more were added as the scope of the work expanded into adjacent areas.

The use of excavators resulted in faster project completion with virtually no breakdowns.
Strategies for Increasing ECE Usage in Construction Activities

Overcoming the roadblocks to ECE adoption will hinge on an array of initiatives from both the government and ECE OEMs.

**Government intervention**

There are several ways the government can help foster more rapid adoption of ECE in India.

**Establish stringent quality norms and better process control.** These need to be embedded in both the bidding process and the project execution itself. Monitoring progress using strict and regular quality checks will improve adherence to the quality norms. For instance, in Malaysia, the Malaysian Highway Authority (MHA) enforces adherence to contract quality norms through the periodic assessment of project progress and by requiring regular maintenance and inspection reports. In addition, it conducts random site inspections and runs quality-control tests. The Gujarat government has also undertaken specific steps to build a superior-quality road infrastructure. It has established separate quality-control units to monitor ongoing road projects. The units are responsible for regular inspection of materials and also for ensuring adherence to contractual quality specifications. As a long-term initiative, the government is building robust information repositories that centralize road quality data from across the state. This data will be used for developing quality-assurance frameworks.

**Offer incentives for on-time completion and safety track records.** Incorporating criteria such as timeliness and a company’s safety record into the bidding process will help build the business case for contractors to invest in ECE. Likewise, imposing penalties for delays and negligence will further drive ECE adoption by contractors.

**Clear away the impediments to renting and leasing construction equipment.** Removing the contractual obligation to demonstrate equipment ownership is essential in order to make hiring equipment a favorable option. Recognition of equipment leasing as either a good or a service, but not both, will do away with double taxation of leasing transactions and make leasing more attractive. Establishing stronger equipment regulations (on a par with global benchmarks) that promote occupational and environmental safety at construction sites will enable large authorized rental players to offer a broader and better value proposition than smaller unauthorized players who compete solely on price. This will eventually help attract more customers to larger rental players and improve rental penetration.

**Standardize tax regulations across states and mandate national registration of ECE.** This move will help boost ECE usage by eliminating the need for contractors to pay multiple RTO taxes.

**Improve financing options.** Establishing policies that make it easier for NBFCs to collect timely payments, move against defaulters, and receive tax compensation for bad debts will contribute to developing the equipment-financing ecosystem in India, and in the process improve access to equipment financing.

**Institute uniform national guidelines on safety and quality requirements at construction sites.** As India’s construction equipment industry matures, using trained operators and mechanics will be essential for improving productivity and safety. Setting safety standards will help in driving the demand for trained ECE operators. For example, in the United States, special
licenses are required for personnel who operate cranes, bulldozers, and loaders. Malaysia, too, has mandated compulsory certification requirements for contractors seeking to work on government-funded projects.

Establish a centralized skill development council for the ECE industry. A council, developed in coordination with OEMs, would be responsible for defining the construction industry’s skill development needs and conceiving a plan to address them. Ultimately the council would identify global best practices in order to develop an industry-wide curriculum, offer vocational training, and provide certifications. Establishing grants and scholarships would make high-quality training programs more affordable for prospective ECE operators.

There are a number of ways in which OEMs can assist with financing. It is also crucial to relax requirements for first-time users through buyback schemes or a co-borrowing option.

OEM intervention

OEMs themselves need to look for more creative ways to promote ECE adoption, including customer education, financing strategies, and workforce training initiatives.

Actively communicate with end users. As OEMs roll out more technologically sophisticated products to meet the demands of the global market, they need to communicate product improvements to Indian contractors. In addition, OEMs need to educate their customers on the correct way to operate equipment.

Play an active role in improving the availability of financing for interested buyers. There are a number of ways OEMs can assist, including exploring long-term tie-ups with financial institutions, establishing in-house financing arms, and setting up dealerships that offer financing. It is also crucial to relax the financing requirements for first-time users through buyback schemes or a co-borrowing option.

Set up training and skill development programs. OEMs need to look for opportunities to collaborate on training initiatives with organizations such as the Industrial Training Institutes. OEMs can also help make training more affordable for students. For example, in Australia, the ECE industry has set up a Construction Training Fund to support vocational training of personnel through levies on construction projects (0.2 percent of total revenue).

Explore collaborations and risk-sharing contracts with component suppliers. This practice, which has been successfully implemented in other industries, can improve component quality and help suppliers with capacity planning. For example, automotive manufacturer Maruti participates in supplier capability development programs, which has raised supplier quality standards. OEMs can also collaborate with suppliers to raise their R&D standards.
Collaborating to Drive ECE Growth

Increased usage of ECE in construction activities is imperative to help drive the growth of the industry in the long term. There are clear benefits to using ECE over manual labor and traditional methods, including improved quality, timeliness, better project financials, and safety. However, challenges such as poor customer education, access to financing, lack of execution discipline, need for a vibrant rental market, lack of skilled manpower, and poor equipment uptime all hinder ECE growth. Going forward, collaboration by OEMs and the government on specific initiatives will help foster growth in this important industry.

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About A.T. Kearney

A.T. Kearney is a leading global management consulting firm with offices in more than 40 countries. Since 1926, we have been trusted advisors to the world’s foremost organizations. A.T. Kearney is a partner-owned firm, committed to helping clients achieve immediate impact and growing advantage on their most mission-critical issues. For more information, visit www.atkearney.com.

About ICEMA

Founded in 1949 as Tractor and Allied Equipment Manufacturers and Importers Association Ltd., the association started with 10 Indian member companies, primarily manufacturers and importers of tractors and earthmoving and allied equipment. In 1986 the association was renamed Indian Earthmoving and Construction Industry Association Ltd. (IECIAL), with the objective of making the body a national point of reference for the Indian earthmoving and construction equipment industry. In 2012 the association redefined its role to become a truly representative body of the Indian construction equipment industry and to expand its scope of services, and became the Indian Construction Equipment Manufacturers’ Association (ICEMA).

ICEMA represents 57 leading companies that manufacture, trade, and finance a variety of products, including hydraulic excavators, wheel loaders, backhoe loaders, motor graders, vibratory compactors, cranes, dumpers, tippers, forklifts trucks, dozers, pavers, batching plants, and diesel engines.