Industry Outlook
EPC CONTRACTORS
THEINDUSTRYOUTLOOK.COM
JULY, 2023

COMPANY SPOTLIGHT

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A Trusted Leader in the Highway, Roads & Expressways Construction with Remarkable Experience in EPC Contracts

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Industry Outlook

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EDITOR'S NOTE

Meeting the Growing Infrastructure Requirements

The Engineering, Procurement, and Construction (EPC) market in India is a key sector that plays a crucial role in the country's infrastructure development. India's rapid urbanization, industrial growth, and increasing focus on infrastructure development have fueled the demand for EPC services. The country has ambitious plans for the development of roads, railways, airports, ports, power plants, water supply systems, and smart cities. EPC companies are instrumental in executing these projects by providing end-to-end solutions, managing complex engineering challenges, and ensuring timely completion within budgetary constraints. One of the major driving factors for the EPC market in India is the government's emphasis on public-private partnerships (PPPs) and the ease of doing business. The government has introduced various reforms and initiatives to attract private investment in infrastructure projects. This has resulted in a surge in EPC contracts being awarded to private companies, both domestic and international, creating significant opportunities for the EPC market. India's renewable energy sector has also been a significant driver for the EPC market. The country has set ambitious targets for renewable energy capacity addition, including solar and wind power projects. EPC companies specializing in renewable energy play a vital role in designing and constructing solar and wind farms, implementing innovative technologies, and ensuring efficient project execution. Furthermore, the growth of industrial corridors and special economic zones (SEZs) in India has contributed to the demand for EPC services. With a conducive business environment and increasing investment in infrastructure, the EPC market in India presents substantial opportunities for companies to contribute to the nation's development and meet its growing infrastructure requirements.

In this issue, we acquaint you with the top companies in this domain. After studying the industry landscape in-depth, Industry Outlook has zeroed in on the top companies that have excelled in this field with their meticulous approach. Having proven their dedication in order to meet the customer expectations in an end-to-end manner, these companies have stood out from the crowd.

We look forward to receiving your feedback and suggestions.

Sudhakar Singh
Managing Editor
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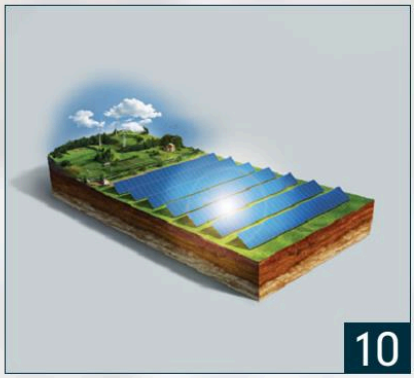


Industry Insights

INDIA & THE US ARE LIKELY TO COLLABORATE ON GREEN H2, CARBON CAPTURE, & BATTERY ENERGY STORAGE

India and the US are anticipated to explore collaboration in green and clean hydrogen, carbon capture utilisation and storage (CCUS) and battery energy storage systems. The two countries could also look to partner to speed up cooperation in offshore and onshore wind power and other emerging technologies for energy transition, people close to the development said.

This comes in the backdrop of Prime Minister Narendra Modi's state visit to the US. The G20 Summit, under India's presidency, has also highlighted the energy transition as a key focus area. "Both countries could look to collaborate on reducing the cost of green and clean hydrogen," one of the persons said.

The production of green hydrogen is currently a high-cost prospect but is expected to become viable with scale. India has ambitious plans in the green hydrogen space. The National Green Hydrogen Mission aims at a production capacity of at least 5 million metric tonnes a year by 2030. The US' Hydrogen Energy Earthshot, launched in 2021, seeks to reduce the cost of clean hydrogen by 80 percentage to $1/kg in a decade.

India has led discussions on the carbon capture utilisation and storage technology as part of the G20 side events and is open to conduct more pilot projects on it, another person said. The major challenges for CCUS are high cost per unit and what kind of technology to use for storage, he added. In

PIDILITE TO MANUFACTURE LITOKOL & TENAX PRODUCTS FROM ITALY IN INDIA

Pidilite Industries Ltd, a leading manufacturer of construction and specialty chemicals, announced the launch of its state-of-the-art manufacturing facilities under its two joint ventures, Pidilite Litokol Pvt Ltd (PLPL) and Tenax Pidilite Pvt Ltd (TPPL), in Amod, Gujarat. Litokol SPA Italy and Tenax SPA Italy have transferred technology to Pidilite as part of the Joint Venture. This event signifies a milestone development in technology transfer in India's stone and ceramic solutions industry.

Tenax offers some of the best product solutions for the installation and upkeep of marble and granite stones. These products provide a seamless finish and long-lasting luster and shine to marble and granite. Litokol's Starlike range of quartz-based technology epoxy grouts are stain proof, nonabsorbent and highly suitable for both interior and exterior floor and wall applications, even in severe operating conditions.

Bharat Puri, Managing Director at Pidilite Industries Limited, said, "At Pidilite, we continuously strive to innovate and lead the way in all our categories and product offerings. Roff, our pioneering brand, is a true game-changer that aims to revolutionize the stone and tile fixing industry in India. The joint ventures with Tenax and Litokol reiterate our commitment to redefine industry standards and delivering world-class solutions. Given our robust distribution network and this global expertise, we will empower our customers with new age and long-lasting solutions. This partnership marks a significant milestone as we stride confidently towards a future of success. We congratulate the teams of Roff, Litokol, and Tenax for their outstanding efforts in making this journey possible". In

INDIA REMAINS COMMITTED TO THERMAL CAPACITY GROWTH TO FULFILL ENERGY DEMANDS: R. K. SINGH

Union Power & Green Energy Minister R. K. Singh said that India would not hesitate to expand its thermal power generation capacity to meet the country's growing energy requirements. Addressing a media event in New Delhi, Singh underscored the government's commitment to strike a balance among renewable energy expansion and the necessity of thermal power. He emphasized that the government has been tirelessly working on ensuring access to energy, enhancing energy efficiency, promoting energy sustainability, and ensuring energy security as the four pillars guiding India's energy sector trajectory.

While acknowledging the high expenses associated with clean energy storage, Singh highlighted the government's efforts to promote the growth of Pumped Hydro Power Projects. These projects are expected to play a significant role in balancing renewable energy intermittency. "Huge capacities of Pumped Hydro projects are coming up. At the same time, we need to build batteries for grid storage. We need to have another PLI scheme for grid scale storage, so that we can augment capacity and have round-the-clock renewable energy. We will keep adding storage to ensure that demand goes up and investment keeps happening", he added.

Additionally, Singh stressed the need for battery storage for grid-scale renewable energy. To bolster capacity and ensure round-the-clock renewable energy availability, the Minister proposed the introduction of another Production-Linked Incentive (PLI) scheme focused on grid-scale storage. Singh expressed the government's commitment to continuously enhance storage capacity to meet rising demand and attract investments. India has set ambitious targets for renewable energy, aiming to increase the share of non-fossil fuel capacity from the current 42 percent to 50 percent by 2030. However, Singh firmly stated that India will not shy away from augmenting its thermal power generation capacity to fulfill energy requirements. He predicted that India's capacity will exceed 800 GW by 2030, showcasing a conservative growth rate.

INDIA APPROVES MICRON'S $2.7 BILLION CHIP TESTING PLANT AMID PM MODI'S US VISIT

Indian cabinet has given the go-ahead for U.S. chipmaker Micron Technology to move on with its $2.7 billion plan for a semiconductor testing and packaging unit as Prime Minister Narendra Modi arrived in the United States. According to the official, who wished to remain anonymous, the cabinet has also approved production-related incentives worth 110 billion rupees ($1.34 billion) for the facility, which is planned to be built in Gujarat.

Throughout Modi's current trip to the United States, an official announcement is anticipated. The source told Reuters that because the incentive package is so large, cabinet approval is required. Even though information about Micron's proposal has previously surfaced, the probable cabinet approval is an important development. Representatives from Micron and the Indian government, including the technology ministry.

PM Modi is set to meet with top executives from well-known American corporations during his tour, which began on Tuesday. These companies include FedEx and MasterCard. He will also be honoured on June 22 at a state banquet held at the White House. The White House is encouraging American semiconductor makers to make investments in India, and Micron Technology's project is in line with those objectives. According to representatives of the U.S. administration, discussions on potential future investments are still ongoing.

U.S. official, President Biden wants to encourage greater economic integration between the U.S. and the greatest democracy in the world while lowering the risks involved with doing business in China for local companies. The amount of American companies considering investing in India has been a source of encouragement, according to a top official in the Biden administration. China claimed in May that the largest memory chip manufacturer in the United States, Micron, had failed a security examination and forbade operators of vital domestic infrastructure from buying its goods. The Biden administration was upset by this decision, but the US Commerce Department would not comment.

PANORAMA

TOP THREE TECHNOLOGIES IMPACTING THE SOLAR EPC INDUSTRY

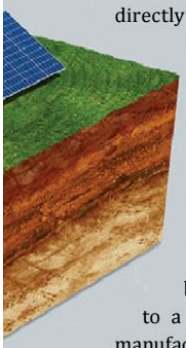
Photovoltaic devices can be used for powering small electronics that include calculators & road signs up to home as well as large commercial businesses

The Indian Solar Engineering Procurement and Construction dispensed significant opportunity for Solar EPC contractors over the last two years. However, the industry often encounters with a certain set challenges & with some of it on account of changing dynamics of market while the others are owing to side cooperation hurdles.

In the midst of the solar boom, the role of solar EPC companies in India has never been more challenging. Also, unfortunately the days of fly-by-night operators are gone since COVID-affected markets demand service providers with the skills for delivering under challenging conditions & wafer-thin-margins.

Solar EPC companies with a strong track record as well as proficiency are highly crucial for meeting deadlines as well as optimizing project performance & managing supply chain challenges, specifically when there is huge price pressure that result from low tariffs. Today, some of the innovators have come up with technologies which will most likely transform the future in terms of how we obtain energy. The three primary technologies through which solar energy is harnessed include solar heating and cooling systems, concentrating solar power and photovoltaic.

Photovoltaic



Photovoltaic devices generate electricity from sunlight directly through an electronic process. This occurs naturally in specific kinds of material known as semiconductors. However, electrons in these materials are freed by solar energy & can be induced to travel via an electrical circuit, that powers electrical devices or sends electricity to the grid.

Photovoltaic devices can be used for powering small electronics that include calculators & road signs up to home as well as large commercial businesses. The price of Photovoltaics has dropped to a greater extent since the industry has scaled up manufacturing & incrementally enhanced the technology with new materials. Installation costs have also reduced with more experienced as well as trained installers. The United States has the 3rd largest market for Photovoltaics installations & is continuing to grow rapidly.

Stopnot Energy Technologies – one of the leading providers of solar power system design and installation companies, specializes in providing solar PV systems. The team of experienced solar technicians as well as engineers help its clients in rendering them with Stopnot energy with high quality of workmanship at an easily affordable rate.

Concentrating Solar Power

Concentrating solar power plants utilize mirrors for concentrating the solar energy for driving conventional steam turbines or engines which generate electricity. The thermal energy that is concentrated in a CSP plant can be stored & utilized for producing electricity when it is required, day or night. At present, roughly 1815 megawatts of CSP plants are in operation in the United States.

The requirement for Rooftop Solar power plants is gaining immense popularity across a broad range of industrial, commercial as well as residential sectors owing to the relatively lower cost of investments & lesser complexities that are involved in setting up a plant.

Solar Heating & Cooling

Solar heating & cooling systems gather the thermal energy from the sun and utilizes it to provide hot water, space heating, cooling for residential & industrial applications. The ROI can be as little as three-six years. Also, commercial systems can assist firms in reducing & managing their energy bills, and long-term costs. In the meantime, fossil fuel prices fluctuate considerably & are anticipated to increase significantly over the next ten years.

The Road Ahead

India's solar energy sector continues to grow rapidly & is forecasted to be one among the top solar markets globally in the near future. On the basis of preliminary numbers, solar installations in the second quarter increased, and this accounted for 11.2 percent of the total installed capacity when compared to 10.69 percent in Q1 2021.

As per Mercom's India Solar Project Tracker, government agencies came up with tenders for 8.5 GW of solar projects in the Q2 of 2021. These figures were up to sixty per cent when compared to the same period last year when only 5.3 GW of solar tenders were actually being announced.

The reason why the Indian solar market is an attractive destination for investors is because the country possesses a robust large-scale solar project pipeline. However, quality solar assets are highly critical for not just the government, but also the developers, investors & acquirers as well.

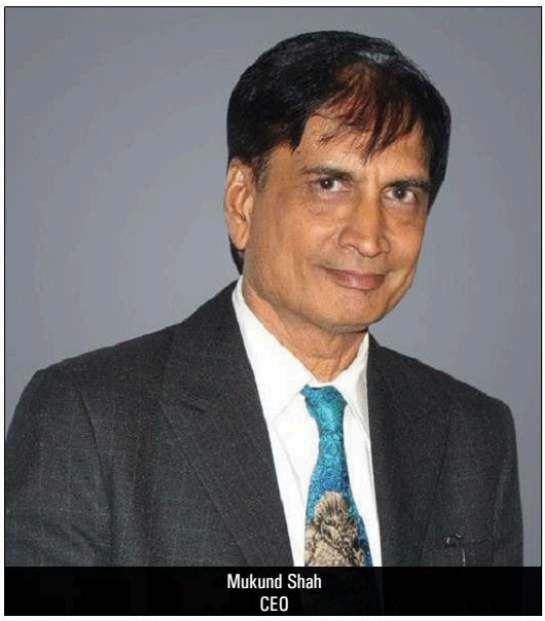
The global solar EPC market is projected to reach USD 63.36 billion by 2028. The growing population in emerging nations have a direct impact on energy consumption & generation, globally. Power generation via renewable sources is one of the best possible replacements for conventional power sources with the rise in carbon reduction. Furthermore, the total cost of solar Photovoltaic is higher when compared to installing regular solar panels, and likely decreasing its acceptance in residential buildings where energy demands are lower, comparatively.

INDUSTRY INSIGHTS

THE IMPACT OF INDUSTRIAL AUTOMATION ON SUSTAINABLE MANUFACTURING

By Mukund Shah CEO, *ARAPL (Affordable Robotic & Automation Pvt Ltd.*

In a conversation with Indranil Chakraborty, Editor, SiliconIndia, Mukund shares his views on major benefits of incorporating industrial automation. During the conversation he also discussed how it helps to reduce waste and greenhouse gas emissions in manufacturing operations and how automation positively and negatively impacted the job market in the manufacturing sector.)



Mukund Shah
CEO

Mukund is a senior management professional with over four decades of experience in well known and reputed organizations. He is a highly talented and well-respected industry leader with extensive expertise in strategic growth and transformation. His ability in developing new setups, managing operations from genesis to the next level of productivity, efficiency, and profitability provide a competitive advantage to the organization.

What are the some major benefits of incorporating industrial automation in sustainable manufacturing processes?

In the coming years, one of the most significant advances in industrial manufacturing will be sustainability. A shift towards more environmentally friendly industries is developing. Here are some of the most significant advantages of industrial automation in making manufacturing processes more sustainable:

• Automation might speed up the completion of production operations, resulting in increased productivity and efficiency.

• Robots assist in the automation of operations, resulting in reduced material waste. This can optimise the use of resources including energy, water, and raw materials, resulting in less waste and consumption. This can lead to economic savings as well as a lesser environmental imprint.

• Automation has the potential to eliminate the demand for human labour, resulting in fewer workplace injuries and diseases.

• Changes in manufacturing needs or new product designs may be easily accommodated by automated systems, offering more flexibility and adaptability to changing market circumstances.

• Automation grants authenticity and there are less chances of errors..

How has industrial automation impacted the efficiency and productivity of manufacturing operations ?

Automation is the application of numerous technologies to automate various production processes, such as robots, artificial intelligence, and machine learning. One of the

most evident advantages of adopting automation in production is increased manufacturing facility efficiency. The use of systems and automation technologies in the production process will result in major improvements to the process, ultimately improving overall efficiency.

> **In the coming years, one of the most significant advances in industrial manufacturing will be sustainability**

By eliminating variability in the production process, automation can increase product quality. Manufacturers may ensure that their goods satisfy the highest quality requirements by automating operations like as assembly and testing. By substituting human labour with machines, automation can assist to lower labour expenses. This has the potential to boost total productivity by allowing producers to create more things in less time. This can assist manufacturers in meeting rising demand for their products without having to recruit more personnel.

What are some examples of sustainable manufacturing practices that have been improved through automation?

Green manufacturing practises assist you in increasing operating efficiency, lowering overhead, and decreasing downtime. They assist you in improving staff morale. They can even help you improve your brand, gain public trust, and get a competitive edge. Automation has had a huge influence on sustainable manufacturing practices, with various examples include using less natural resources, lowering waste and emissions, and recycling and reusing materials.

Here are some examples of sustainable manufacturing process that have been elevated through automation:

• Automation allows for the use of energy-efficient lights and motors, lowering the amount of energy required to run the equipment.

• Automated robots aid in the process by using sensors to detect faults and mistakes early in the manufacturing process, lowering the quantity of defective items produced at the appropriate time.

• Automated systems attempt to preserve natural resources by recycling and reusing water in the manufacturing process, as well as using renewable energy sources and implementing carbon capture technology.

What impact has automation had on the use of raw materials and natural resources in manufacturing?

Given that machines only use a limited amount of materials that will be used in production, automation aids in the efficient use of natural and raw materials. Here are some examples of this:

• By optimising the utilisation of raw resources, producers have been able to eliminate material waste. Advanced software and machine learning algorithms, for example, can optimise raw material cutting patterns to save waste. This minimises overall raw material use, which aids in the conservation of natural resources.

• Manufacturers have been able to enhance recycling rates and minimise the quantity of garbage sent to landfills thanks to automation. Automated systems, for example, may sort and segregate items for recycling, reducing the quantity of garbage that must be disposed off.

• Manufacturing's environmental effect has been reduced thanks to automation, which has reduced pollution and

greenhouse gas emissions. Manufacturers, for example, may employ automated systems to optimise energy use and decrease carbon emissions.

> **The fast speed of digital change has created new opportunities for businesses to construct more sustainable industries**

How has automation helped to reduce waste and greenhouse gas emissions in manufacturing operations?

Robots are smaller and need less energy than most traditional production equipment. They are also significantly cleaner to run since, unlike other equipment, they do not generate pollutants such as fumes or smoke. Robots help to create a clean production environment by minimising the amount of pollution discharged into the atmosphere. In numerous ways, automation has played a key role in lowering waste and greenhouse gas emissions in manufacturing operations. Here are a couple such examples:

• Machines can be configured to run solely during off-peak hours when energy costs are lower, lowering overall energy usage and greenhouse gas emissions.

• Automated systems can detect inefficiencies and waste, allowing for targeted process changes that result in less waste and emissions.

• Automation has helped to reduce waste and greenhouse gas emissions in industrial processes by increasing efficiency, optimising energy consumption, allowing lean manufacturing practices, and assisting with recycling initiatives.

What are some potential drawbacks or challenges associated with the widespread implementation of industrial automation in manufacturing?

Although industrial automation has numerous advantages, it also presents its own set of challenges. The high cost of establishing and maintaining automation systems is a significant barrier. While automation can increase efficiency and productivity, the initial costs can be prohibitive for some businesses, particularly small businesses. Another issue is the scarcity of skilled employees capable of operating and maintaining these devices. Workers must be taught new skills and software to keep up with the changing needs of the industry as automation technology advances.

There are several issues in Industrial Automation at the moment:

- A lack of trained and knowledgeable personnel.
- Variable demand.
- It has yet to be widely deployed.
- My country lacks core robotics manufacturing companies.
- Shifting trends.

How has automation impacted the job market in the manufacturing sector, both positively and negatively?

Automation's influence on the employment market has been both beneficial and harmful. On the plus side, automation has simplified and increased the efficiency of many tasks. It has also opened up new opportunities for people who know how to handle and maintain automated machinery. On the bad side, automation has removed numerous occupations that were formerly performed by humans.

Positive Impact of automation on Employment:

Contrary to widespread assumption, automation can actually lead to more job prospects. When companies automate some processes, it allows their staff to focus on more creative and higher-level work. This, in turn, leads to higher work satisfaction and lower turnover.

Negative Impact of automation on Employment:

Many individuals are concerned about the negative impact of automation on employment. As technology progresses, the potential of machines replacing human labour in numerous areas grows. As businesses seek to cut costs, this could result in mass unemployment and wage decreases. Furthermore, it has the potential to increase inequality by benefiting those who own the machines while leaving the rest of us behind.

What steps can be taken to ensure that industrial automation is implemented in a way that supports sustainable manufacturing practices and benefits society as a whole?

One of the most essential things that society aims for is a clean environment. Countries and companies within them are establishing goals to attain net-zero emissions. Many businesses will need to transform their industrial systems in order to reduce their environmental impact. The trend towards more environmentally friendly industries is developing. Previously, businesses made changes in response to stakeholder demands, environmental concerns, regulatory regulations, or direct financial gain. Change is now required. Here are some ideas that manufacturers could consider for the world's green development.

• **Waste reduction and renewable energy**

Large manufacturers invest in on-site generation, such as solar panels, wind turbines, and geothermal pumps. However, depending on the size of your company, you can take small steps towards a more sustainable economy.

• **New technology and digitalization**

The fast speed of digital change has created new opportunities for businesses to construct more sustainable industries. From the workplace to production, new technologies may be used to achieve better and more productive results.

• **Autonomous manufacturing**

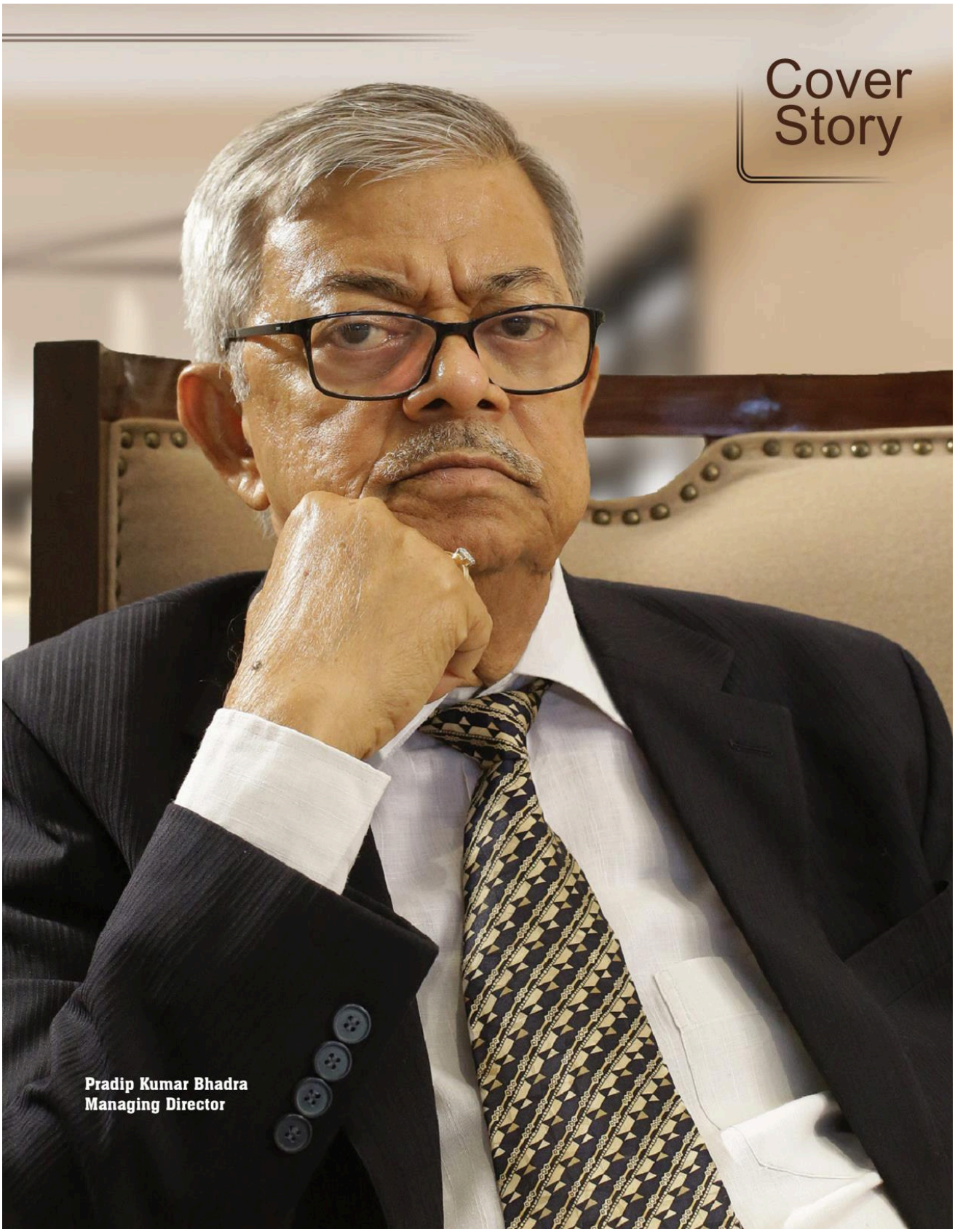
Manufacturing's future is autonomous and automated. This implies that manufacturers must prioritise innovation and the optimisation of manufacturing techniques and procedures. In

Industry Outlook TOP 10
EPC CONTRACTORS 2023

BVEPL

A Trusted Leader in the **Highway, Roads & Expressways Construction** with Remarkable Experience in EPC Contracts

At present, as India has been forecasted to be the fastest-growing construction superpower owing to the increased urbanization and population growth, rising infrastructure costs, and an increase in housing structures, the demands placed on the EPC sector also seem to be growing significantly to boost the nation's growth & building development. In fact, EPC, a contract comprising Engineering, Procurement, and Construction is a key contributor for the major parties who tender projects to undertake the construction works. Well, as the construction market in India is expected to reach Rs.117.02 trillion by 2027 expanding at a compound annual growth rate (CAGR) of 17.26 percent during the 2022-2027 forecast period, the EPC sector will markedly grow relative to the constructions around. While EPC is solely a mode of construction contract bagging 80 percent of the government tenders, be it any EPC subsidiary like BOT (Build-Operate-Transfer) contract, a HAM (Hybrid Annuity Model) contract, or a PPP (Public–Private Partnership) contract, all concessionaires require EPC contractor to execute their contracts. In the past, there were numerous contracts like Item Rate contracts, Model Standard Bidding Document (SBD) contracts, and more, but EPC stands its point being at par with all the others since 2011, helping avoid all the variations that used to occur earlier. Distributing the Engineering work including the designing and more to the contractor side and ensuring the construction visibility as EPC seems a more efficient mode of construction, there are various other benefits to it. Most importantly, the EPC mode of contract helps the leaders in construction to implement a lot of new ideas at the construction site. Thus, EPC remains at the core of construction, and its demand never fades away.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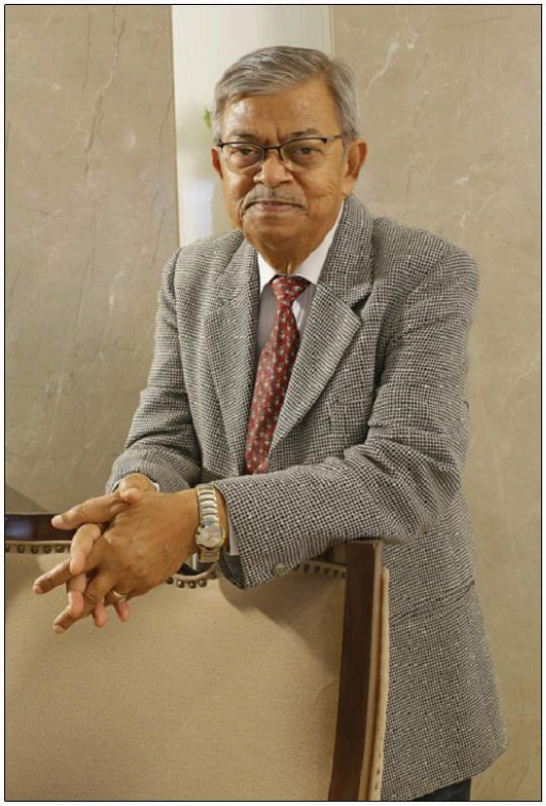
Story
Pradip Kumar Bhadra
Managing Director



The Company & its Unique Construction Solutions

Founded in 1973, Bharat Vanijya Eastern (BVEPL) has established itself as one of India's largest privately held infrastructure development companies. With a strong focus on the construction industry, BVEPL has been instrumental in executing notable EPC projects, contributing to the sector's substantial growth. Under the exceptional leadership of Pradip Kumar Bhadra, who serves as the Managing Director of BVEPL, the company has leveraged its industry expertise to spearhead these initiatives. "The BVEPL is now one of the leading EPC contractor finesse in India and we are committedly improving the geography of construction. As of now, we are working across West Bengal, Jharkhand, Bihar, Arunachal Pradesh, Manipur, and Karnataka. We are trying to expand from the Northeast region to the East, and now we are spreading along Karnataka including the other parts of the Southern region. We are trying to grow in a big way, as far as the EPC contract is concerned", avers BVEPL.

The effectively positioned company BVEPL's flagship is into Road Construction and Highways, which implies not only the Construction, of Roads & Highways, but, the expansive Expressways construction, through the building of Railway over Bridges, Major Bridges, Minor Bridges, Flyovers, Grade Separators, Pedestrian Underpass (PUP), Minor structures, Toll-plaza, Rest Areas, and Amenities. While these are all part & parcel of an Expressway, Highway, or Road construction like railway, tunnel, irrigation, construction demanded by the Airport Authority of India, and others, BVEPL's services limit to only Highway & Road Constructions, and is specialized into the same as well.

> ***BVEPL, a strategically positioned company, specializes in the construction of roads, highways, & expansive expressways. Their flagship service revolves around creating & developing efficient road infrastructure***

With regards to construction, there always exist diverse issues which come into the picture either from the banker's end or the client/customer/the general public's side. The land acquisition marks number one, followed by the forest approvals for falling trees, along with environmental clearances. These all together are the three major points with which people generally face challenges, and which lead to an excessive delay in the execution of a contract. "What happens is that most of the big-size contracts are taken either by the Central or the State government depending upon different funding by the World Bank, ADB, or any other major bankers who are funding this project. Though these three bodies are helping in the clearance of land acquisition, the forest environment is generally taken care of by the District Administration. It simply implies that there's a chain of approvals that leads to the successful execution of a contract. For example, even if the Central government is funding a project, it has to approach the State government and the State government approaches the District Administration to assist with this.

NH33 Ranchi Jamshedpur

Generally, in the EPC mode of contract, as the land is given to a contractor incumbrance free for a period of five years plus the construction period, the contractor strives to ensure that there is no further encroachment after the contract is signed. In the second part of the EPC contract, the contractor is given the liberty or authorization to directly contact the forest department, electrical department, PHE department, or utility department, along with the District Magistrate for expediting the process of land acquisition for removal of utilities, and all of the other facilities which are required to be done prior to commencement of construction. So, apart from the government, the contractor is also playing a very vital role during the development period, to remove these things, which earlier was done by the State or the Central government with the help of the District Administration. Now, apart from the District Administration, the EPC contractor is also playing a very important role in this pursuit.

"Our uniqueness is that, we are believers not in creating CEOs or Vice Presidents, we believe in creating entrepreneurs. Hence, what we have done to decentralize the process of construction is that we have created lots of subsidiaries within the main company, where numerous owners or stakeholders are created like an entrepreneur who is taking care of each segment. For example, if there is a Railway over Bridge, we have got a segment or person in the company as an entrepreneur, who's taking care of only Railway over Bridge construction and who specializes in doing that. This unique methodology, helps us get the best of the people and deliver the required to clients", states Pradip.

BVEPL are government contractors. As there's a national and international bidding process, it gets the contracts through the tendering process (open tender) doing bids on the different portals knowing about the E-notices. While bidding for the tenders is an extensive process, BVEPL thoroughly checks the viability, accessibility, costing, computation of quantities, and other things, because in the EPC mode, the engineering, design, drawing, construction, and procurement & construction, are done by the contractor party. "There are different modes of contract like HAM or BOT (which are a part of PPP), where we are not in a big way, but there are a lot of concessionaires like big giants in our field, who are more into financial modeling like Adani, and so many other big companies out there who are more interested in BOT or HAM projects. Hence, we are trying to tie up with the financial concessionaires who are into a long-term BOT or HAM, so that we can take the EPC contracts from there (right before the tendering process) because they also need an EPC contractor to do the work", adds Pradip.

SH1 Bongaon Chakdaha

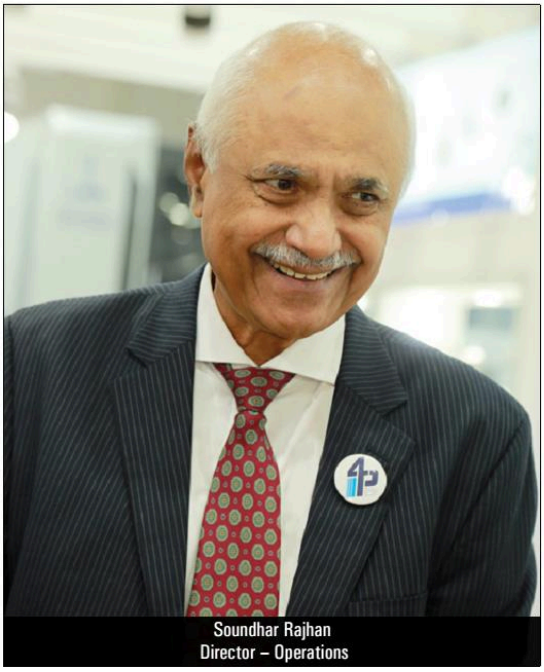
Future Roadmap

Through proficient employees deployed in the team and serving the clientele directly such as the NHAI (National Highway Authority of India), MORTH (Ministry of Road Transport & Highways), and PWD (Public Works Department), and private contractors like Ashoka Buildcon, and DRA, the company has come a long way as of today. Currently in the 50th year of its existence, as they touched more than 1000 crores of revenue in 2023, rising from scratch, BVEPL further plans to relish 2000 crores turnover in the approaching next two years. Furthermore, there are several projects in the pipeline that will be adding more to its brand value in the future.

INDUSTRY INSIGHTS

INDUSTRY TRENDS & OPPORTUNITIES FOR THE MACHINE TOOL INDUSTRY

In an exclusive interview with Industry Outlook, K. Soundhar Rajhan, Director of Operations - Machine Tool Division, Lakshmi Machine Works Limited. expresses his views on the machine tool industry's rising technological trends, including the need for automation, digitization, sustainability objectives in manufacturing processes and more. He has more than a decade of experience in supply chain management, organization building, and general management. Also, Soundhar Rajhan is on the boards of the Indian Machine Tool Manufacturers Association and LMW Aerospace Industries Ltd.



Soundhar Rajhan
Director – Operations

What are the emerging technology trends in the machine tool industry and how are they expected to impact the market in the near future?

The demand for high speed machines in machine tool manufacturing has been increasing in recent years. It offers several advantages and caters to the evolving needs of the industry. It increases productivity through faster cutting and machining operations. It also reduces cycle time. High speed machines supports in enhancing precision with incorporating advanced technologies like precision servo motors, linear guide ways. These features enable tighter tolerance and improved accuracy, resulting in high quality products.

> **Automated manufacturing processes are often more precise and consistent as it helps to produce machines with higher quality, leads to customer satisfaction**

Modern industries often require the machining of advanced materials like titanium alloys, high-strength steels and composites. High speed machines equipped with powerful spindles and cutting tools can effectively handle these materials, enabling the production of complex designs with intricate details.

With the growing demand for customized products, high speed machines allow manufacturers to quickly prototype

new designs and efficiently produce small to medium sized batches. This agility in manufacturing is essential for industries like aerospace, automotive and medical devices.

It is also compatible with automation technologies such as robotic loading/unloading systems. This integration enhances overall efficiency and leading to increased productivity. It also facilitates predictive maintenance, process optimization, real time data monitoring as part of the Industry 4.0 paradigm.

How is the growing demand for automation and digitalization of manufacturing processes driving growth in the machine tool industry?

Increased efficiency – Automation and digitalization of manufacturing processed allow for more efficient use of time and resources.

Improved quality – Automated manufacturing processes are often more precise and consistent. This helps to produce machines with higher quality, leads to customer satisfaction.

Flexibility – Digitalization and Automation also allow for greater flexibility in manufacturing processes. Manufacturers can quickly and easily reconfigure their production lines to accommodate changes in demand and design, which can help to reduce down time and increase efficiency.

What are the main opportunities for machine tool manufacturers in industries like automotive, aerospace, energy, and medical equipment?

Automobile: Automobile industry in India is at a growing phase especially the electric vehicle market is expected to expand at a CAGR of 49% between 2021 – 2030.

Indian passenger car market is expected to reach a value of US$ 54.84 billion by 2027, with CAGR of 9%

Aerospace: The Aerospace and Defense (A&D) market in India is estimated to around 5,25,000 Cr by 2030. Aerospace industry demands for high quality components, that are produced in high-volume and requires high precision with bespoke production solutions.

Medical Equipment: Machine tool contributes for manufacturing high precision medical equipment parts/ accessories, surgical implants, dental tools, etc. The medical equipment industry is estimated to reach around Rs. 48,543 Cr by 2024, with CAGR of 27.4%. Additionally, the government has taken several initiatives to promote the growth of the medical device manufacturing industry in the country. Make in India program encourages domestic manufacturing and also boosts exports.

Other industries like Die & Mould, Electronics, Agri machinery and equipment are also growing. The positive growth in these industries helps to create huge opportunities for machine tool manufacturers.

What are the future challenges that machine tool manufacturers will face?

Machine tool manufacturers are likely to encounter several future challenges. Some of them are as follow as:

Technological advancements: The machine tool industry continuous to adopt more digital technologies. Manufacturing machines built with automation and industrial internet of things (IIOT), the use of AI to program machines, can be a challenge. Manufacturers will need to continually innovate and upgrade their machines to remain competitive. CAM software is becoming increasingly sophisticated, offering advanced features and capabilities. However, utilizing the software effectively will be a challenge for machine tool manufacturers.

Customization and Flexibility: Customers are increasingly demanding customized solutions and flexible manufacturing processes. Machine tool manufacturers need to enhance their capabilities to deliver highly customizable machines that can adapt to changing production needs.

Sustainability and Environmental Regulations: Increasing focus on sustainability and environmental regulations pose challenges for machine tool manufacturers. They need to develop Eco-friendly technologies, reduce energy consumption and comply with stringent regulations related to emission and waste management.

What is the future of additive manufacturing technologies like 3D printing and how are they expected to impact the machine tool industry in the long term?

Additive manufacturing gained popularity for rapid prototyping due to its ability to quickly create prototypes and iterate designs. It is well-suited for low volume production and custom manufacturing. Whereas, machine tool industry primarily serves production machining needs, catering to higher volume requirements. It focuses on efficient and precise manufacturing of parts and components.

There can be some overlap between additive manufacturing and the machine tool industry. Some machine tool manufacturers have started incorporating additive manufacturing capabilities into their machines, allowing hybrid processes that combine both additive and subtractive techniques. This integration leverages the strengths of both technologies and offers enhanced manufacturing capabilities.

It is important to note that while additive manufacturing technologies have potential, there are still challenges to overcome such as material limitations, scalability and cost-effectiveness for high volume production. While, additive manufacturing and the machine tool industry share some common objectives in manufacturing, they employ different principles and serve distinct purposes.

> **Circular economy principles play a significant role in driving innovation and growth in the machine tool industry**

What role will sustainability and circular economy principles play in driving innovation and growth in the machine tool industry and how can manufacturers leverage these trends to create new market opportunities?

Circular economy principles play a significant role in driving innovation and growth in the machine tool industry. Applying this encourages machine tool manufacturers to design products with durability. This means creating robust and long lasting machines that can be easily upgraded. It also helps in resource efficiency and optimization. Manufacturers can explore innovative techniques and technologies to optimize material and energy use during production processes.

This can involve using advanced materials, improving manufacturing processes and implementing energy saving measures. By integrating circular economy principles, machine tool industry can drive innovation, reduce resource consumption, minimize waste generation and create new growth opportunities. This transition towards more sustainable and circular approach can lead to economic, environmental and social benefits for the industry and its stakeholders. In

OSWAL INFRASTRUCTURE

PROMISING TURNKEY SOLUTIONS FOR PROJECTS RIGHT FROM DESIGN TO COMMISSIONING

Ratan Bokadia
Director

Rapid expansion in the Indian economy is boosting demand for hydrocarbons and energy in India, resulting in a continuing push from the government to increase local oil and gas output in order to reduce import dependence. This in turn has created significant growth opportunities in the Indian EPC market. EPC players in the market are likely to provide a wide range of solutions, including hand-holding from project inception to commissioning and smooth project handover. Having said that, providing turnkey solutions to customers by partnering with them at all stages of the project to assure attaining the endpoint in the most efficient manner.

OSWAL Infrastructure is a company established with the goal of boosting the country's economy by contributing to the hydrocarbon and energy industries. OSWAL Infra began as a modest manufacturing enterprise in 2011-12, with a particular focus on the modular skids and process packages industry. Following that, the company established itself as a key EPC player, providing solutions from concept to commissioning, primarily in the Upstream and Midstream segments of the hydrocarbon industry. OSWAL Infra has a proven track record of completing challenging and demanding projects in brownfield and greenfield environments, delivering many projects on schedule and meeting high international quality standards. The majority of OSWAL's EPC projects over the previous decade include Surface Facilities for Oil and Gas Fields, Early Production Facilities, Oil and Gas Processing Facilities, Off-Site Utilities Projects, Well Hook-up Projects, Cross Country Pipeline Work, and so on.

"We believe in micro-level planning and hiring competent people to ensure that project tasks are completed on schedule. We seek to drive high standards of practice as a trusted organization through a process of continuous improvement, wherein our strategy of hand-holding our clients throughout the life cycle of the project has helped us in developing a strong connection with our clients. Safe execution of projects is the utmost important aspect of any EPC project execution and OSWAL is committed to protecting the health and safety of everybody involved in the execution of the project. We aspire to a high standard of practice through a process of continual improvement. Another distinctive practice used by OSWAL in the execution of these EPC projects is the use of modularization and prefabrication to the greatest extent possible. This considerably aids us in lowering site execution time and, as a result, greatly optimizing site budget", says Ratan Bokadia, Director at OSWAL Infra.

"Our success in the EPC industry is backed by our in-house state-of-the-art manufacturing plant, which is part of our Heavy Engineering Division (HED). Our manufacturing facility is ASME 'U', 'U2', 'R', 'PP', and IBR certified, and has supplied equipment and packages to major oil and gas companies in India and around the world, including ONGC, OIL, IOCL, MRPL,

CPCL, BPCL, GSPC Gas, GAIL Gas, GAIL India, Cairn Oil and Gas, Reliance, Linde, Air Products, Emerson, EXXON-Mobil, and many more. Such a large client base attests to HED's capacity to create and distribute high-quality items", he adds.

> Oswal Infrastructure is pioneer in providing concept to commissioning solutions to Process & Energy sector

Robust Roadmap Ahead

OSWAL Infra, led by Ratan Bokadia - Director, is on the growth path and wants to generate close to Rs. 1000 crores in revenue in the next five years. Apart from the oil and gas upstream and midstream areas, the corporation is diversifying into other industrial segments. As part of that effort, it recently received a prestigious order from BALCO (Vedanta Group Company). The company is also investigating the possibility of entering the Green Energy Sector, LNG Terminals, LNG Stations, and Well Testing Facilities, among other things. OSWAL Infra has also partnered with a few multinational firms to advance into these markets.

OSWAL Infra believed in working on only a limited number of projects and delivering high-quality products and services to its niche clients on time. This has also given them an advantage over their competitors in terms of client appreciation and support during the project's execution. Our method of holding our clients' hands throughout the project's life cycle has assisted us in developing a solid connection with them. "Our project execution team engages with the client from the beginning and strives to maintain a high level of transparency with our client at all stages of the project, which aids us in developing a high level of trust with our clients and, in turn, aids our execution team in meeting our contractual obligations", concludes Ratan.

INDUSTRY INSIGHTS

THE ROAD TO DIGITIZING MANUFACTURING: DEMYSTIFYING IIOT

By Sundarram Srinivasan, *Managing Director, Lincoln Electric (India)*

Sundarram Srinivasan
Managing Director

Sundarram is an alumnus of IIM Culcatta with handful of management skills, steering the firm towards success as its Managing Director.

This article, although complete in itself, can be viewed as an executive summary of a book on the long and tortuous road to digitizing manufacturing, with each paragraph actually representing the executive summary of a chapter on that topic. It is intended to create a high level awareness in the reader of what she does not know in order not to be blindsided when commencing a project of this nature, and so to be able to ask the right questions. However it also includes lessons the author has learned through hard experience.

IIoT is the Industrial internet of things, i.e IoT in industrial applications. It is merely the process of extracting analog data from machines in the factory, converting them to digital data, transmitting the data, storing it, summarizing/compressing/re-organizing/analyzing the data and displaying it.

Critical Areas of Operations to be Managed

The most basic information the factory management looks for is production and efficiency in terms of OEE. There are others. Energy is a critical area, as it is a 'green' cost saving. Quality is a must, i.e monitoring of critical to process and critical to quality parameters. Safety parameters like critical temperatures, pressures, fluid levels, and effectiveness of safety systems. Maintenance is an area where there is very little information and most maintenance is carried out by ad hoc decisions. Monitoring part changes, preventive maintenance activities and machine health monitoring are vital.

Functions like work order management which require interaction with the ERP system should reside (in my opinion) in the ERP for reasons that become apparent when we get to security and understanding system architecture. Again for the same reason, control of the machine operation should not be an integral part of this system, but on a separate VLAN, something to discuss while talking about network segmentation.

Causes, Effects, Events, Data Compression, Data Storage

In general, there will be recording of two types of data: causes and effects. Production and downtime are examples of 'effects', and will usually be viewed against some other data i.e causes; for instance, which machine, which product, which operator, which shift, what reason for stoppage etc. Each change of cause is recorded as an 'event'. For example, the completion of a particular batch of raw material or the change of a specific part or operator suggests the cause has changed. Unraveling the relationship between cause and effect is the key to the IIoT system.

Recording the data is at a different level of granularity from its usage. When data is recorded, it would be on a per second or millisecond basis generally. But when you look at the data, this level of granularity is not required. So the data can be compressed into per minute or hour for instance when viewing live data. Again if you are looking at historical data you may tend to look at it in days, so the data can be compressed into days. The storage of data needs to be in a manner that is consistent with its expected usage.

Databases

The database needs to capture data in a manner that cause and effect can be correlated. Also, it should be possible to isolate and study parts of the database, like specific shops, machines, products, dates, and more. The data needs to be extracted and presented quickly and efficiently. An SQL data base should get the job done although other options may be available. MySQL is an open source system which enables interaction with the data base and would be my weapon of choice.

Where this data is to be stored is another decision, at the 'edge' or in the cloud?

The 'Edge' & The 'Cloud'

There are several computations that should be done at the edge (or 'on premises') to avoid latency, particularly in time sensitive computations. It is also important where connectivity to the cloud is not good as it provides temporary storage as well. For instance you need to know when some parameter has crossed a limit, to take immediate corrective action, it is not optimal for the data to be sent to the cloud, be processed and come back as output. So, all real time activity should be at the edge, with only the historian outside- either on a computer (which can be on premise) or on the cloud. Data compression, which I talked about earlier, can also be performed at the edge.

Having a computer on premise that does all the heavy lifting enables disconnection from the internet. And a second computer that mirrors the historian and with internet connectivity enables the best of both worlds.

Industry Outlook TOP 10

EPC CONTRACTORS 2023

EPC Contractors Integrating Safety & Efficiency in Construction Services

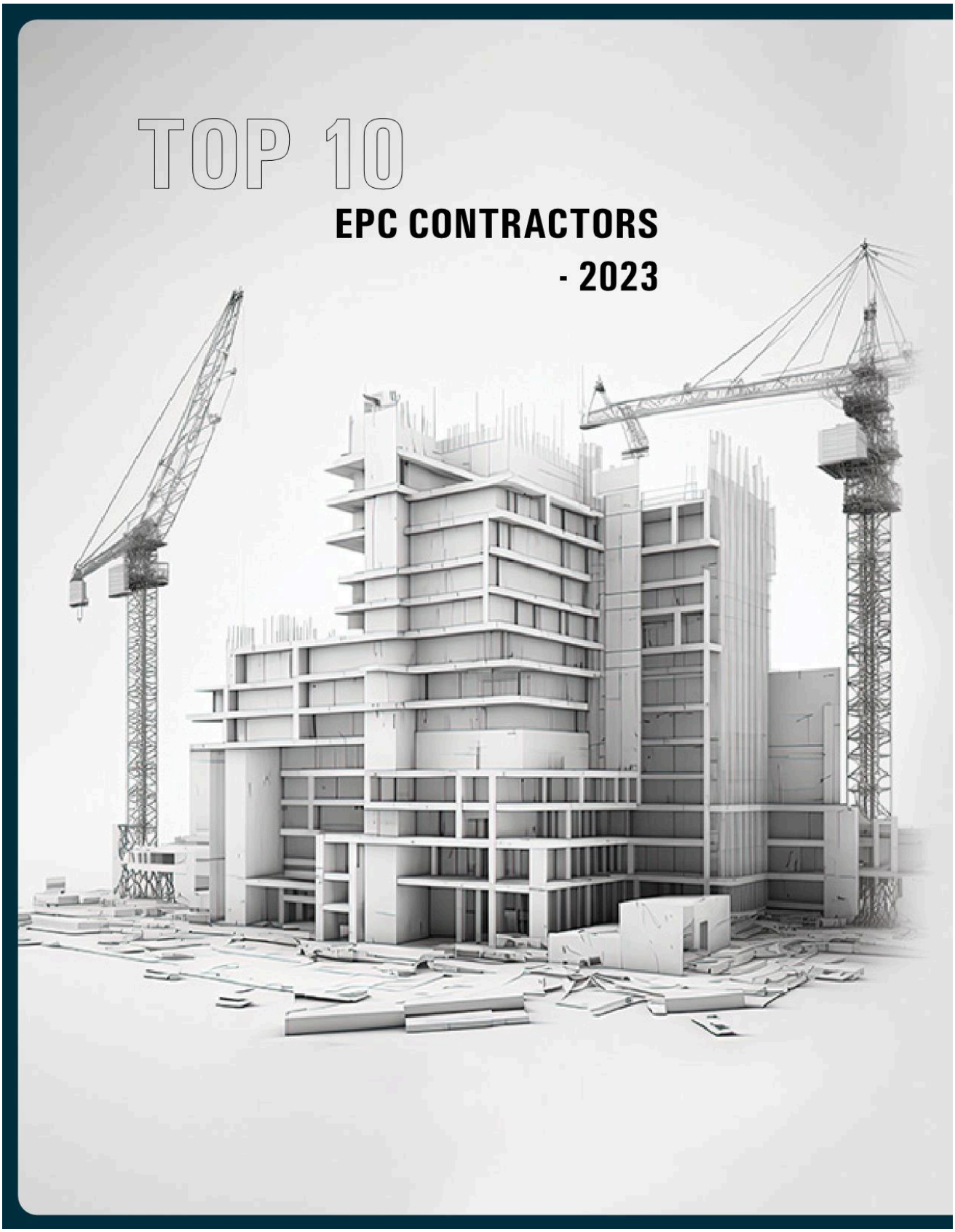
Engineering, procurement, and construction (EPC) is a prominent form of contracting agreement in the construction industry. As India's second largest economic component EPCs are creating thousands of employment opportunities today. EPC industries are involved in executing projects involving multiple engineering disciplines with overall responsibility for the performance of the whole plant. Nowadays, almost every company, specifically the one working in the renewable energy industry and power sector is looking forward to use EPC contracts for developing and constructing the large-scale complex infrastructural projects. The EPC companies in India are evolving from multiple routes, with engineering companies, equipment suppliers, construction companies and project developers morphing in to EPC service providers by filling in the gaps. EPC deliver a complete package of resources to complete infrastructure projects.

Significance of EPC Contractors: EPC contract is a type of construction contract between parties where the contractors are responsible for all engineering, procurement, and construction activities to handover the completed project to the employer or owner within a predefined time and cost. An EPC contractor plans and executes all engineering, procurement, and construction activities needed to complete a capital project. The epic contractors are responsible for detail engineering or design involved with the project, procurement of all the necessary equipment and materials required to build the project, and construction of the facility. EPC contractors play a major role in streaming line the modern energy and power industries. The EPC contractors provide with detailed scope of work that encompasses the functional and technical significations of the facility or machinery under construction.

Revenue of EPC Industry: Demand for EPC is projected to exhibit growth at 5.7 percent CAGR between 2022 and 2032. Market share analysis of EPC services based on end-use industry and region. Under the end-use industry segment, power & energy leads with 21 percent market share in 2022.

Industry Outlook in this issue presents a list of **'Top 10 EPC Contractors – 2023'** who have leveraged their extensive industry expertise and experience in offering high quality products in the industry. The following list has been prepared after being closely scrutinized by a distinguished panel of judges including CXOs, analysts, and our editorial board. We recognize their valuable contribution to the ever expanding and competitive market and their ability to sustain themselves and emerge as top contestants through their reliable products.


Time is
money,
and EPC
contractors
are masters
of both


TOP 10
EPC CONTRACTORS
- 2023

COMPANY	MANAGEMENT	DESCRIPTION
Avaska Vastrapur avaska.in	**Avadh Patel,** **Malav Shah** Directors	A construction services company that has created a niche for itself in the industry through its customer-centric approach, extensive business expertise, and a clear understanding of all nuances pertaining to the EPC segment
Bhandari Associates Pune bhandariassociates.co.in	**Sandesh Umardand** GM- EPC	A company with an objective of providing excellent residential and commercial customized construction solutions to the ever growing consumers in the city
BVEPL Kolkata bvepl.com	**Pradip Kumar Bhadra** Managing Director	A company involved in road construction and highways, which implies not only the construction, of roads & highways, but, the through, major bridges, minor bridges, flyovers and many more
Eskay Engineers Kolkata eskayengineers.co.in	**Subrata Banerjee** CEO	A pioneering firm specializes in a wide range of EPC services, such as project planning, feasibility study, environmental engineering & troubleshooting of existing plant
HAL Offshore Mumbai haloffshore.in	**Vineet Agrawal** Director - Projects	Provides services include gas compression units, oil and gas gathering stations, oil and gas processing facilities, oil collection stations and more
Kintech Synergy Ahmedabad kintechsynergy.com	**Jigar J. shah** MD	An experienced engineering and technology firm for procurement and project management, construction and commissioning, with a solid grasp of asset management
KRR Engineering Chennai krr.co.in	**Sakthivel Ramaswamy** CEO	An EPC contracting company involved in research and development for developing manufacturing equipment, maintenance & refurbishments, and special purpose equipment and others
Nauvata Engineering Bangalore nauvata.com	**Ashwin Raikar** CEO	An engineering & project management company providing world class engineering, procurement & construction management services to oil & gas companies worldwide
NRP Projects Chennai nrpprojects.in	**Shailesh Patel** Director	An engineering construction companies providing integrated design, detailed engineering, procurement, construction and project management services for oil and gas industry
Oswal Infrastructure Ahmedabad oswalinfra.com	**Ratan Bokadia** Director	An industry completing challenging & demanding projects in brownfield and greenfield environments, delivering many projects on schedule and meeting high international quality standards

Industry Outlook TOP 10
EPC CONTRACTORS
2023

AVASKA PROJECTS

TAKING MASSIVE STRIDES IN THE INDIAN EPC SPACE

Avadh Patel
Director

Post the COVID-19 onslaught, the Indian real estate & construction industry has gradually gathered momentum and is well on its way to its old glory. Rapid urbanization, increased awareness about the advantages of investing in real estate and the massive infrastructure development happening in the country are some of the major factors fueling this industry growth. According to IBEF, the Indian real estate market which stood at $200 billion in 2021 is expected to contribute 13 percent to the country's GDP and hit the $1 trillion mark by 2030.

While there is a hoard of companies operating in the industry currently, Ahmedabad-based Avaska Projects is one company that has earned the recognition of being one of the most trusted and reliable EPC contractors in the country. Founded in 2016, Avaska Projects is a construction services company that has created a niche for itself in the industry through its customer-centric approach, extensive business expertise, and a clear understanding of all nuances pertaining to the EPC segment.

"Avaska is one of the fastest growing EPC companies in the country, led by a team of young and dynamic entrepreneurs with prior family experience in the industry. We excel at solving complex client challenges and are committed to making every project a success. Our success has not only benefited our clients but has also propelled our growth with every successful project we deliver", says Malav Shah, Director, Avaska Projects.

Currently, Avaska offers three major services – Turnkey Industrial Construction, Turnkey Building Construction, and Land & Real Estate Development. As of today, the company has completed three projects successfully, i.e. Vinte Villas and one Industrial Turnkey Project each at Savli and Moraiya. Keeping customer satisfaction as paramount, Avaska offers each of its services focused around the core principles of transparency and quality, wherein it gives prior information to its customers about the material & technology being used and the costs associated with them well before the execution stage of the project. Additionally, the company has three rounds of QC in place – first by the labor themself, then by the site engineer, and later a final check by any of its business partners who are managing the project execution cycle.

Avaska has a very elaborate client engagement process in place comprising nine steps – understanding the client's requirement, developing a proposal, contract negotiation, project planning, procurement, engineering, construction, commissioning, and handover, thus handholding its customers throughout the entire project cycle. This structured and well-planned approach has enabled the company to successfully cater to

Malav Shah
Director

all demands clients put forward and deliver projects in a timely manner.

> Avaska is positioned as one of the fastest-growing EPC companies in the country

When asked about Avaska's future roadmap, Avadh Patel, Director, says "In the future, we plan to expand into new areas by opening offices and partnering with local businesses to make it easier for clients to use our services. Our organization values innovation, and we are focused on improving our services through digitization, automation, sustainability, modularization, and integrated project delivery. We strive to find new and creative ways to provide value to our clients and remain competitive in a fast-paced industry". In

INDUSTRY INSIGHTS

GLOBAL HEADWINDS CONTINUE TO WEIGH ON CORPORATE INDIA'S EARNINGS IN THE CURRENT FISCAL

By **Shamsher Dewan**, *Senior Vice President & Group Head, ICRA*

Shamsher Dewan
Senior Vice President & Group Head

Shamsher has over 14 years of experience in Credit Ratings Industry with focus on Managing Credit Rating Assignments for leading Indian companies, authoring numerous Industry Research Reports, developing Financial Models, Credit Risk Evaluation and Team Management.

Ever since the pandemic began in CY2020, Corporate India's performance has fluctuated significantly, with new challenges arising and becoming more acute with each passing quarter. While domestic demand has clearly increased in all sectors this fiscal year, with robust YoY revenue growth, the profitability has remained under pressure due to the ongoing inflationary environment. In addition, there are indications of a slowdown in important industries due to ongoing geopolitical upheavals and global inflationary pressures, casting doubt on the export sector's pace. While supply-side issues have undoubtedly improved since the COVID-19-related disruptions, things still aren't back to normal everywhere just yet.

According to an ICRA analysis of around 250 listed firms (excluding banking sector entities), the aggregate performance in H1 FY2023 has demonstrated favourable trends in sales, with Corporate India's aggregate revenues increasing by 35.2 percent YoY. This expansion was facilitated optically by the previous year's low base, which was affected by the pandemic's second wave. Furthermore, price increases across numerous industries as the demand climate stabilised, as well as the pass-through of inflationary pressures from input costs, aided growth. The secular increase was recorded across many industries on a YoY basis.

However, revenue growth was softer on a sequential basis (compared to H2 FY2022), at 10.8 percent, with diverse trends recorded across industries. The higher realisations reflected the global economy's energy cost inflation and the heightened crude oil price trend, which was exacerbated by the Russia-Ukraine war. Revenue growth was accordingly the highest in the commodity-oriented sectors. However, while the oil and gas and power sectors witnessed a 30 percent and 38 Percent growth in revenues, respectively, vis-à-vis H2 FY2022 levels,

the iron and steel sector saw a sequential contraction in revenues by six percent, led primarily by softening in steel prices in recent months, although it still remains almost 50 percent higher than the April 2020 levels.

Other sectors that reported a visible increase in revenues from H2 FY2022 levels were IT, automotive and fertilisers. For IT, the growth was led largely by increased levels of digitisation globally, and to some extent by benefits of rupees depreciation vis-à-vis dollar. However, the sustainability of this growth remains to be seen, especially with the recessionary trends brewing in the developed markets of Europe and the US, which are key markets for Indian IT companies. FMCG, on the other hand, reported modest single-digit growth, primarily led by price hikes undertaken to offset the input cost inflation, while volume growth was subdued due to softness in rural demand. The automotive sector witnessed revenue expansion, supported both by demand pick-up, as well as price hikes undertaken to pass on the input-cost inflation. Hotels and airlines also continued to report positive growth trends, reflected in improving occupancies as well as pricing, as the concerns related to the pandemic steadily abated. While some of the infrastructure and construction-oriented sectors reported sequential contraction in revenues in the current fiscal, the same is largely due to seasonality, with construction activity slowing down in the monsoon seasons. The Government's focus on construction and infrastructure investments has been one of the supportive pillars of growth over the recent quarters, and this trend is expected to sustain over the near to medium term, and thus aid allied sectors such as cement and steel as well.

Companies have been, however, unable to realise the benefits of the improved demand in their earnings performance, with the operating profit margin (OPM) of Corporate India in H1 FY2023 contracting on both YoY (by 410 bps) as well as sequential (by 277 bps) basis. The OPM of 15.9 percent reported in Q2 FY2023 was in fact, at more than 20-quarter lows, with multiple headwinds impacting the earnings of India Inc. Demand revival, post the pandemic, led to a sharp rally in prices of most commodities, especially metals, to multi-year highs, exerting pressure on India Inc.'s margins. Prices of other commodities have also moved up over the past five-six quarters, thus impacting the margins as companies are unable to fully pass on the same to the customers. While these have seen some softening over the recent months, they remain at elevated levels, especially vis-a-vis the pre-pandemic levels. In addition, several sectors have also faced softening in rural demand, which impacted revenues and margins to an extent. Price hikes taken by most entities and stabilisation in input costs in recent months may help arrest a further slide in the margins of Corporate India going forward.

> **For IT, the growth was led largely by increased levels of digitisation globally, and to some extent by benefits of rupees depreciation vis-à-vis dollar**

The interest coverage ratio of ICRA's sample, adjusted for sectors with relatively low debt levels (IT, FMCG and pharmaceuticals) witnessed a YoY and sequential weakening in H1 FY2023 to 4.7 times, led primarily by the moderation in earnings and an increase in interest costs due to hikes in repo rates as well as increased reliance on external borrowings by Corporate India in the light of suppressed earnings, and these trends are likely to continue over the near term. Overall, the working capital intensity has increased across many sectors, on account of the higher raw material prices, and the requirement to store higher inventory to mitigate supply chain uncertainties.

ICRA believes that the H2 FY2023 performance of India Inc. would face similar constraints as supply chain issues are easing only gradually, while commodity-led headwinds continue, especially in the wake of the elevated crude oil prices, depreciation of the rupees vis-à-vis dollar and the geo-political developments. The appreciation of the rupees vis-à-vis the euro and the GBP has also impacted companies with exports in these currencies. Furthermore, the demand recovery in rural markets, which has been relatively subdued in the current fiscal, remains critical. The combined impact of these multiple factors on the credit metrics of India Inc. remains to be seen. The weakening of the overall performance would be especially visible in sectors which have limited ability to pass on the inflationary pressures through price hikes to end customers. Fear of global recession also remains an evolving risk for export-focused sectors such as IT, automotive and textiles. The ongoing geo-political developments as well as the changes in Monetary Policy, including the firming up of interest rates, and their impact on the demand environment and costs, are potential headwinds, and remain key monitorables for the credit profile of Corporate India.

Industry Outlook TOP 10
EPC CONTRACTORS 2023

ESKAY ENGINEERS

LEVERAGING ON INNOVATION & TECHNOLOGY TO CARVE A NICHE IN THE INDIAN EPC SECTOR

Subrata Banerjee
CEO

With a massive boost in urbanization as well as industrialization, the Indian infrastructure & construction industry has been experiencing growth like never before in terms of economic development as well as technological advancement. The infrastructure & construction sector in India is mostly driven by Engineering, Procurement, and Construction (EPC) contractors. From engineering design & material procurement to construction & commissioning, EPC contractors provide end-to-end project execution services and have extensive expertise and experience in managing complex engineering & construction projects. The rise in the construction sector combined with various government initiatives, especially the Make in India scheme in 2020, has been helping the EPC sector grow moderately.

Even various incentives, especially 13 Production Linked Incentive (PLI) schemes, including Key Starting Materials (KSMs)/Drug Intermediates (DIs), Active Pharmaceutical Ingredients (APIs), and Food Products, have been giving a boost to the Indian EPC sector. A subsidiary of Eskay Group of Companies, Eskay Engineers is a Kolkata-based leading EPC firm specializing in technology transfer, project planning, project administration, Environmental Engineering with ETP, STP, and Control devices and related consultancy services. the firm, over the years, has worked with numerous leading organizations from a diverse range of industries while building an excellent legacy of being one of the industry leaders in the Indian EPC sector.

Coming to flagship services, Eskay Engineers specializes in a wide range of EPC services, such as project planning, feasibility study, turnkey chemical projects, environmental engineering, and troubleshooting of existing plants. Various factors help the firm stand out from the rest of its peers in the market, which include unconventional thinking in design, selection of low-cost alternatives to keep the overall cost down, efficient project management to avoid time & cost overrun, foreign collaborators and think tanks that provide the latest technology, and loyal clientele developed over the years.

The customer engagement process starts with receiving the statement of requirement from the client. The team then does a thorough analysis of the requirement, which includes project planning, feasibility study, plant design, basic engineering, and detailed engineering, before sending a final estimation to the client. Once approved, the team then takes care of Plant Construction, Site Preparation, Layout planning, Erection & Commissioning, Trial Operation, and Standardization before handing over the final product to the client.

Eskay Engineers always focuses on careful project planning to avoid unnecessary project delays. Even the extensive experience of the team works in favor of the firm when it comes to designing the process around unit operations involving a proper set of machinery. The firm believes in the drafting of contracts with careful negotiation, which helps cut down the delay and withholding of payment.

Starting in 1969, Eskay Engineers has come a long way in terms of overall revenue and client base expansion. The firm was established by the late S.S. Banerjee, a celebrated chemical engineer and pioneer in the Eastern Region for the Chemical Plant industry, and has vast experience working on a diverse range of projects over the years. Under the able guidance of Subrata Banerjee, the second generation in the family-owned business, the firm has gained further acceptability and recognition through various foreign collaborations as well as being involved in advanced technology transfers.

> The uniqueness of Eskay Engineers is its foresight to avoid bottlenecks and honest engineering

Coming to the future roadmap, Eskay Engineers has been selected as a consultant for the proposed chemical hub by a Foreign Government. The firm is eyeing the export market and is partnering with a large industrial group to develop innovative products that will help capture CO2 to mitigate global warming. Also, the next generation, being third generation engineers are coming up remarkable to take up the mantle.

INDIAN MANUFACTURING INDUSTRY'S PATH TOWARDS GREEN FUTURE

By Ravichandran Purushothaman, *President, Danfoss India*

Ravichandran Purushothaman
President

Ravi is a member of Danfoss Global management team, Board member & Global mentor since 2013, who is working actively in energy, water, food & agri technology space supporting & mentoring several early stage startups.

Energy efficiency, value chain mobilization, and sustainable alternatives can help achieve Net Zero Emissions. The world economy is battling inflation accentuated by the energy crisis. There was a period of oil shocks and soaring inflation in the 1970s and early 1990s when the world was in this situation before. But this is a rude shock to the globe as it was just overcoming the nightmares of the pandemic. Should this be a wake-up call for India? India can use this situation as a blueprint and set the foundation for a cleaner, cheaper, more resilient, and self-sufficient energy infrastructure.

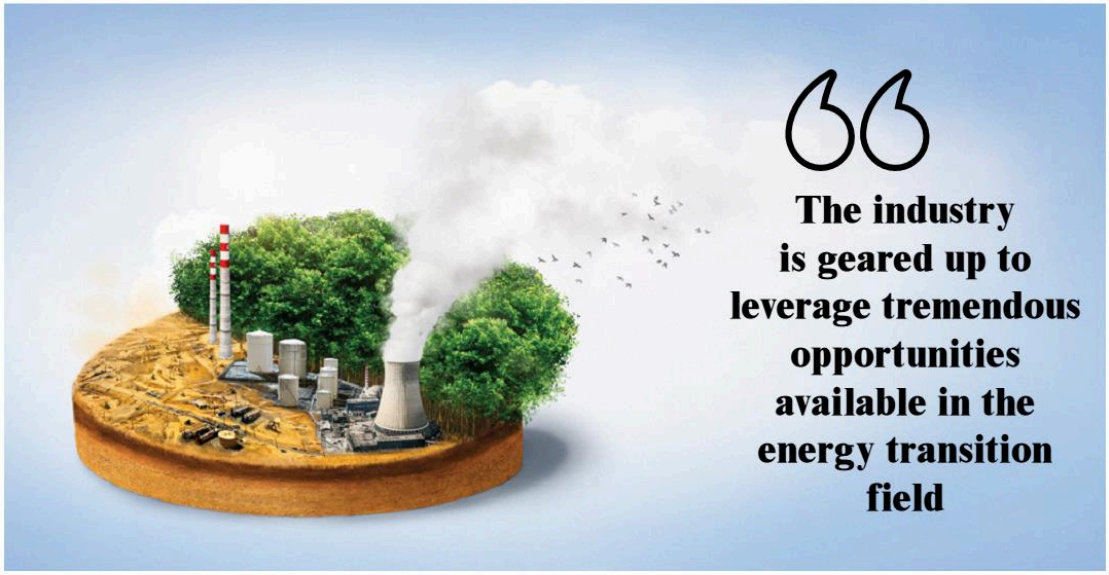
Fortunately for India, the government began advocating the goal of 'Net Zero' emissions well before the energy crisis, not as a reaction to it but for the sake of the greater good of humanity. India pledged to cut greenhouse gas emissions by 45 percent from 2010 by 2030 to achieve net-zero emissions by 2070. At the COP26 conference in Glasgow, Prime Minister Narendra Modi unveiled the 'Panchamrit' five-pronged strategy to combat climate change. The pledge to meet 50 percent of its energy needs from renewable sources by 2030 is one of this policy draft's standout elements.

India's path towards 'Net Zero' would be challenging as India's GHG (Greenhouse Gas) emissions would be peaking by 2040s. Further Mitigation required to become Net Zero by 2070 will be exponentially higher than historic performance on this count. Despite several efforts by the government and industry players, India faces several pressing near-term challenges.

Interventions for accelerating Decarbonization for the Indian Manufacturing Industry:

1. **Energy Efficiency:** Energy Efficiency will play a major role by contributing 44 percent in BAU (Business as Usual) and 32 percent in Deep Decarbonization Scenario for the Indian Industry. To achieve the nation's goal of improvement in energy intensity per unit of GDP, the industry will have to invest in technologies, processes, and end-mesh. This will require a rate of progress more than double what it has been in the past. For example, standards and labeling by the Bureau of Energy Efficiency (BEE), Energy Conservation Building Codes (ECBC) by the Ministry of Power, and the Promotion of Electric vehicle - National Electric Mobility Mission Plan (NEMMP), among others, all contribute to achieving energy efficiency goals.

2. Use of the Renewables & Clean Technologies: The emphasis laid by the government on green energy has opened the floodgates. The industry is geared up to leverage tremendous opportunities available in the energy transition



field. Advancement in technologies is enabling corporates to procure round-the-clock green power. RE deployment is expected to double (or even triple), and more than 30 percent of industrial emission mitigation depends on EE measures. Renewable electricity is growing fast in India, with new capacity additions doubling by 2026. The share of solar and wind in India's energy mix have grown phenomenally.

3. Circular Economy or Value Chain Mobilization: Circularity is about the five Rs: Reduce, Repair, Resell, Refurbish and Recycle. Value chain emissions constitute more than a company's total carbon footprint. The transition can be based on the redesign of the supply chain. Innovations in logistics is a key enabler to drive circularity when it comes to optimizing production volumes, enhancing the life cycles of the products, and devising end-of-life recycling.

4. Biomass, Hydrogen & Other Zero Carbon Fuels: Many futuristic technologies like Hydrogen, CCUS, Fuel Cells, and many are still nascent and have high-cost implications. India is one of the world's largest producers of modern bioenergy. Hydrogen has the potential to decarbonize transportation, heating systems, and industrial operations, which are currently challenging to decarbonize through renewable energy. On the one hand, these technologies require a huge push on the policy front, but industry leaders also need to come forward and demonstrate their commitment to adopting the same.

5. Carbon Capture Utilization & Storage (CCUS): With CCUS, carbon can be captured from large point sources and energy facilities that burn fossil fuels or biomass. According to the IEA, the role of CCUS in achieving net zero emissions is crucial, since without it, options for tackling heavy industry emissions would be limited or nonexistent.

Way Ahead

International Energy Agency (IEA), in its report on achieving Net Zero for Heavy Industry Sectors recommends:

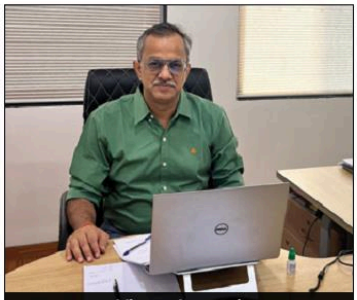
- **Foster Innovation & Green Finance in Heavy Industry: Near**-zero emission technologies should be funded with grants and low-interest loans. These funds would benefit industrial plants, logistics, storage, and related areas.
- **Promote Demand for Near-zero Technologies:** By encouraging the use of materials with near-zero emissions, the government can help boost demand. Long-term public-sector procurement is an example of government support.
- **Uniform Industry Standards & Tools:** Measurements are being developed to assess carbon emissions across industries and nations. As a result, governments can agree on a common reporting framework.
- **Clarity in the Taxonomy:** Existing efforts undertaken by the industry and the governments; IEA suggests can be termed as 'low emission production'. This way, it can be differentiated from net zero emissions.

A shift to green energy is a huge economic opportunity. As a large developing economy with over 1.3 billion people, India's energy ambitions are not just transformational for India but the entire planet.

Industry Outlook TOP 10 EPC CONTRACTORS 2023

HAL OFFSHORE

A VERITABLE ONE-STOP SHOP FOR PROVIDING OFFSHORE & LAND-BASED EPC PROJECTS & UNDERWATER SERVICES



Vineet Agrawal
Director - Projects

When it comes to managing complex large-scale projects, an Engineering, Procurement, and Construction (EPC) contractor is a one-stop-shop that offers a complete suite of project management services, from engineering to procurement and construction. One prominent player in this industry is HAL Offshore, which provides Offshore, Land Based EPC services and underwater services to India's oil and gas sector. The firm offers a diverse range of services encompassing EPC contracting and sub-sea and marine services. EPC contractors like HAL offer end-to-end solutions for complex projects, ensuring smooth and efficient execution from start to finish.

HAL Offshore has come a long way since its inception in 1998 as a resource aggregator. Today, the business has made a name for itself as a major force in India's offshore and land-based oil and Gas EPC sector and underwater services sector. In 2002, HAL Offshore provided MSV SEAMEC III to provide full-range IMR/ underwater work for ONGC for three years. In 2004, the firm executed its first offshore EPC job and went on to become a leading player in the EPC segment. In 2008, HAL acquired a fully-equipped fabrication yard in Navi Mumbai, which has been critical to its success. "Our Underwater Service vertical provides high-end DP II Diving Support Vessels to carry out comprehensive Underwater Inspection, Maintenance, and Repair (IMR) programs. On the other hand, our EPC division carries out large-scale Greenfield and Brownfield EPC projects in offshore and land-based sites", speaks Vineet Agrawal, Director - Projects, HAL Offshore.

The firm offers a comprehensive EPC services portfolio that includes the detailed engineering, supply, installation, hook-up, and commissioning of complex process and utility packages for offshore and land-based oil and gas installations. HAL Offshore's services include gas compression units, oil and gas gathering stations, oil and gas processing facilities, oil collection stations, and more. It also offers a range of process systems, including Glycol Dehydration Systems, effluent treatment, produced water treatment, and ground and seawater filtration and injection systems. In addition to this, we also provide alkaline surfactant polymer preparation and injectionas a technology provider. HAL has developed this technology as the 1st among Indian companies.

As an ISO 9001, ISO 14000 and ISO 18000 certified organization, HAL Offshore has received independent validation of the Quality Management Systemfrom surveyors. "Our Health, Safety, and Environment policy is designed to promote and maintain awareness of workplace hazards, minimize risks, and ensure employee competency. We regularly review performance, specify Key Performance Indicators, and recognize excellence. Our policy also guarantees adherence to national, international, and industry standards, and it upholds a reporting system that enables incident analysis and suggestions for company-wide recurrence prevention", says Vineet Agrawal.

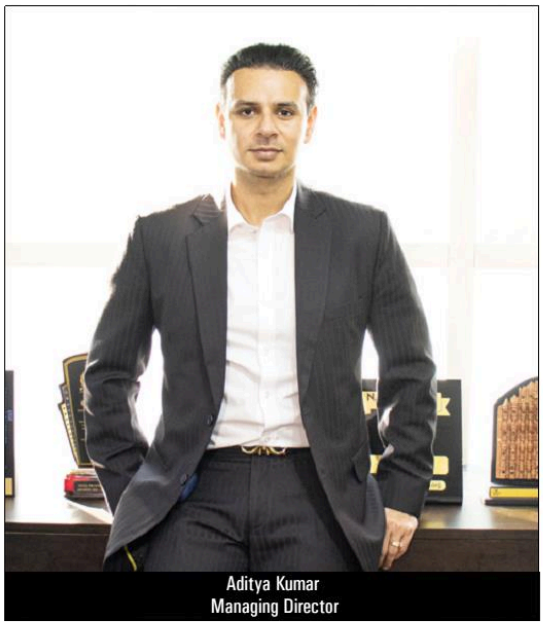
> As an ISO 9001, ISO 14000 and ISO 18000 certified organization, HAL Offshore has received independent validation of the Quality Management System from surveyors

The MM Agrawal Group to which HAL Offshore belongs was founded in 1964 by the Late Professor Professor M.M. Agrawal who was also a Philanthropist, Educationalist, Industrialist, and social worker. He was known for his work in the upliftment and welfare of people. The current Chairman of the group is Sanjeev Agarwal, a man of vision, with over three decades of experience in creating diversified business interests for the group. The history and accomplishments of HAL Offshore stand as a testament to the visionary leadership of its founder and the continued dedication and hard work of its current leadership and employees. With a strong focus on innovation, quality, and sustainability, HAL Offshore is well-positioned for continued success in the years to come.

INDUSTRY INSIGHTS

INDIA'S ELEVATOR MARKET RISES: DOMESTIC COMPANIES THRIVE TO TAKE OVER GLOBAL PLAYERS

By Aditya Kumar, *Managing Director, Victora Lifts*



Aditya Kumar
Managing Director

Aditya is a wonderful example of an entrepreneur who is doing more than just starting a prosperous company. He has gained respect and admiration among people from all walks of life for his devotion to improve and develop the world. He has built a successful company that emphasizes innovation, client happiness, teamwork, ethics, and entrepreneurship. He completed his MBA programme at Amity University in 2010.

The Indian economy is among the fastest-growing economies in the world. Real estate and infrastructure contribute significantly to this growth. There has been a dominance of global elevator players in this market for a long time. Fortunately, this is no longer the case with the emergence of Indian elevator companies! Their capabilities foster innovation and competition, resulting in better infrastructure products and services.

The success of Indian elevator companies can bring pride and prestige to the nation. A high-quality product and service meeting international standards prove their ability to compete with global players.

Let's discuss the challenges and opportunities for top lift companies in India.

> **Residential and commercial sectors will increasingly demand vertical transportation solutions in the coming years, driving the growth of the Indian elevator industry**

India's Real Estate & Infrastructure Market

In India, the real estate and infrastructure markets create jobs, generate revenue, and boost other sectors. It is driven primarily by residential and commercial properties.

The expansion of urbanization in India and the limited availability of land have led to an increase in the number of high-rise buildings. For these infrastructures to function effectively, elevators must be used to transport people and goods. This creates a market demand for elevators.

> **The expansion of urbanization in India and the limited availability of land have led to an increase in the number of high-rise buildings**

Global players have played a dominant role in the development of the Indian elevator market, bringing advanced technology, expertise, and investment. They have surely introduced competition to the Indian elevator market. Their success in gaining traction and establishing themselves as credible players in the marketplace becomes increasingly difficult. It may also be difficult for them to access the same markets and customers, therefore limiting their growth potential.

Fortunately, several elevator safety regulations have been introduced in India, including the Lifts, Escalators, and Passenger Conveyors (LEPC) Act, which stipulates standards for elevator design, manufacture, installation, and maintenance. Indian lift companies are all set to raise the bar in the elevator industry. With their ability to comply with international safety standards, they will be able to compete with international elevator brands on a level playing field.

Vertical Development of India: The Perfect Opportunity for Indian Elevator Companies to thrive vertical development, as it has become increasingly popular in India due to rapid urbanization and limited land availability. This situation presents a perfect opportunity for Indian elevator companies.

The lower labor and manufacturing costs of Indian elevator manufacturers allow them to offer better prices than their global counterparts. The advantage to them is that their products become more affordable and competitive, especially in the affordable housing market.

Top lift companies in India can strengthen and develop the market by leveraging their local knowledge, providing cost-effective solutions, and focusing on innovation.

Elevator Companies in India: Future Prospects

Residential and commercial sectors will increasingly demand vertical transportation solutions in the coming years, driving the growth of the Indian elevator industry. There are positive prospects for this sector that are mainly driven by factors such as urbanization, infrastructure development, safety regulations, and technological advancements.

Moreover, the Indian government's efforts to promote urbanization and infrastructure development, as well as an increase in demand for energy-efficient and sustainable elevators, may offer Indian companies a market expansion opportunity. With this support, they will be able to provide vertical transportation solutions for new smart cities and sustainable urban developments. In

KINTECH SYNERGY

A LEADING EPC FIRM RECOGNIZED FOR ITS TURNKEY SOLUTIONS

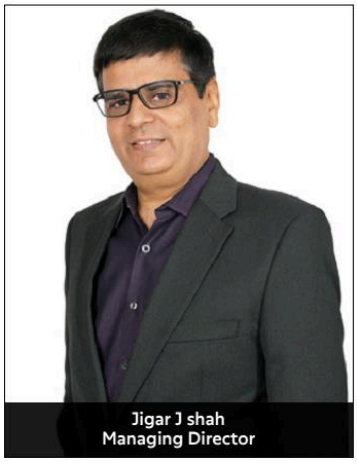
In 2021, the scope and value of the worldwide Power EPC market were estimated to be worth around $654.5 billion. The market is estimated to exceed a CAGR of 4.9 percent and reach over $848.7 billion by 2028. A major player in this segment, Kintech Synergy is known for offering the best-in-class services. Over the years, the firm has established reputable experience in engineering and technology, procurement and project management, construction and commissioning, with a solid grasp of asset management. Kintech brings close to three decades of experience to the table in this industry, and as a result, is well aware of the project's risk, giving the team a particular advantage when providing solutions to anticipated problems.

"Kintech provides a complete range of project services from 'Concept to Commissioning' with the highest quality and safety standards. Kintech Synergy has established a reputation for demonstrating efficient project management and engineering capabilities, supply chain management, and project execution with on-site decision-making capabilities", shares Jigar J shah, Managing director. Kintech delivers client-specific solutions pertaining to specific projects undertaken by the firm with various clients. The firm delivers turnkey projects fulfilling the entire spectrum of technical specifications provided by them. The firm's unique structure plays a vital role in offering competitive EPC solutions for projects in the energy and infrastructure sectors.

Various departments are responsible for continually improving and developing processes pertaining to that segment. This allows systematic monitoring of projects without any overlap of decisions or opinions, while maintaining the highest quality of the outcome. The firm's approach is quite thorough and completely client-centric. The client engagement process undertaken by Kintech starts from concept to commissioning by employing diverse technical teams. Solutions are designed focusing on the end-user requirements as well as client aspirations and instructions. Upon completion of this, a cost and budget analysis is conducted to ensure that the solutions recommended are not exceeding the client's expectations. Once this is done, the team starts the EPC procedures to bring life to the solutions designed by the teams in the earlier steps.

> Kintech provides a complete range of project services from 'Concept to Commissioning' with the highest quality & safety standards

Kintech's team is the reason behind the firm's success. The team's expertise is set in motion by predefined roles, goals, communication, trust, collaboration, and conflict resolution processes. The firm upholds the foundational values of respecting individuals, treating employees fairly, following ethical business practices, and honoring all commitments.



Jigar J shah
Managing Director

To ensure that all the values are maintained, the firm empowers the team to explore innovative paths when developing solutions, continually strive to enhance productivity, and contribute to the firm's overall growth. The firm also takes great pride in the team's commitment to delivering high quality work to ensure complete client satisfaction.

Future Aspirations

"Every journey is different. The biggest make-or-break factor in a service experience is the people who provide service. Our expansion strategy is synonymous with a growth strategy. We seek to achieve faster growth, compete, achieve higher profits, and capitalize on economies of scale, to have a greater impact", shares Jigar J shah. The company has also recently gained access to new segments in the renewable energy sector across the states of Gujarat, Rajasthan, as well as Madhya Pradesh by offering robust services and solutions line. This strategic expansion is expected to act as fuel for propelling the Kintech's future expansion plans.

INDUSTRY INSIGHTS

DIGITIZATION OF PRODUCTION & SUPPLY CHAIN TO ENHANCE THE EFFICIENCY

In an exclusive interview with Industry Outlook, Gulshan Kaushik, Vice President-Customer Success, Bizongo shares his insights on the Indian digital transformation market, the growth potential of small and medium manufacturing companies, importance of smart manufacturing and more.

Gulshan Kaushik
Vice President-Customer Success

The global digital transformation markets size is expected to reach $1,548.9 billion by 2027 at a Compound Annual Growth Rate (CAGR) of 21.1 percent. How do you see this market evolving in India? What are the major factors driving the growth of this market?

In 2007, approximately four percent of the Indian population had internet access and in 2017, that number grew to 27 percent. In last five years, that number has grown to 60 percent and by 2027; I expect that there will be one billion people who have access to the internet in India. If you empower someone with the internet, they have access to the B2C market. At present, 60 percent of the Indian population needs the visibility of what they are doing on the internet and brands will not be able to give this accessibility to the consumers until they have it. For this, the B2B market has to be more empowered in order to ensure proper visibility and as a result of this, a lot of information will be generated which can be used for demand forecasting, supply planning, and understanding the business behaviour among others. Relevant information can only be provided if you have a visibility around both the data and resources and these factors will contribute towards the growth of the digital market.

Industry digitalization is expected to develop new business models and present significant potential for small and medium-sized businesses. How can digitalization help organizations meet customer demand and corporate objectives, while remaining competitive worldwide?

B2C brands are dependent upon MSMEs to procure the products which are bought by the end-consumers. On the MSME manufacturing side, digitization has only happened at the machinerylevel but nobody has thought about the digital interaction between a customer and the business. To address this gap, Bizongo has created a cloud factory, which empowers an MSME manufacturer to create more SKUs for his customer and an unmatchable supply schedule. By introducing digital methodology on the entire production process and supply chain, we can make a factory much more efficient where various stakeholdershave access to relevant information so they can plan their business much more effectively.

Please elaborate on how some of the essential elements such as agile delivery methodologies, data management, enrichment, talent development and so on help B2B companies facilitate their digital transformation.

The major allocation of resources in the MSME manufacturing market goes to: a) MSME manufacturing facility building the

infrastructure which includes the purchase of the machines, building of the plant and so on. b) Inventory whether it is in the form of raw materials or in the form of finished goods, and c) Extending the working capital which means extending the credit to the customers. The first problem is building the capacity, where having the right data will help the manufacturer to make better informed decisions. For inventory management issues, Bizongo introduced a solution called Smart Inventory Auto Replenishment which is based on the actual consumption of a product and not on sales prediction. This solution helps to ensure the optimal utilization of inventory.

Global MNCs are innovating at a faster rate than their Indian counterparts, and Indian SMEs are constantly playing catch-up to stay competitive. What kind of steps should SMEs in India take in smart manufacturing to make Indian factories smarter, more productive, and more efficient?

There are global companies who are frontrunners in digital adoption and are coming up with smarter solutions. Businesses should produce things that the customers want and then, if you are able to create a visibility around it, that is the smartest way of managing any manufacturing facility. Platforms which enablethe MSME ecosystem to have that information, and help them manufacture smartly is what is required in the Indian market. Also, these platforms which enable factories to manage that information should do a lot of research, and they should make that data visible. This will help the manufacturers utilize their working capital much more efficiently. We at Bizongo have developed a Cloud factory which helps people understand how a factory should operate depending upon the capacity and unused capacity, and on the order history to help improve their manufacturing operations.

Customers wish for personalized products but do not want to pay more than they would for mass-produced items. Hence, manufacturing must be more versatile than ever before, focusing on customized mass production. How can manufacturers address these issues?

I am someone who is a great fan of frameworks and in this case, I will take the help of a digital solution. Then, I will create a framework that shows my open book cost which my customers can see.This can help them better understand all the different costs that I incur during the manufacturing process. In a different approach, I will calculate the additional cost as well as the depreciation of my machineries caused by thecustomization. Then, using a cost modelling tool or platform, I will be able to let the customer know the updated cost. Both these methods improve the transparency between the manufacturer and the customer, which helps avoid unnecessary confusions and conflicts.

Industry Outlook TOP 10
EPC CONTRACTORS 2023

KRR HEAVY ENGINEERING

BUILDING EXCELLENCE THROUGH EXPERTISE, INNOVATION & CUTTING-EDGE TECHNOLOGY

The Engineering Procurement Construction (EPC) industry is an important sector that plays a vital role in the development of infrastructure projects and is driven by factors such as economic growth, population growth, urbanization, environmental regulations, and the need for novel and upgraded infrastructure. However, the EPC firms face various challenges that can impact project delivery, cost, and quality and it becomes essential to look for firms that can mitigate risks through effective planning and technology. One such firm is KRR Heavy Engineering.

> We leverage specialized technology, efficient R&D & strive to deliver superior quality products & services to stay ahead of the competition

Based out of Chennai, Tamil Nadu, and established in 1976, KRR Heavy Engineering is one of the leading and most sought-after heavy engineering and finest equipment manufacturing companies in India. The organization is ISO 9001, ASME, and Petroleum and Explosives Safety Organization certified amongst several other certifications. KRR Heavy Engineering is on a mission to deliver excellence in heavy engineering solutions leveraging state-of-the-art technology backed by research and innovation. The organization provides services in Engineering Procurement Construction contracts, and design-build contract which delivers comprehensive solutions tailored for clients. They are also involved in Research and Development for developing manufacturing equipment, maintenance, and refurbishments, and special purpose equipment and prototype development. we have almost five decades of industry experience in handling large projects and equipments. This facilitates us to have established systems and processes in place from engineering stage to delivery of end products to the clients", adds Sakthivel Ramaswamy, CEO of KRR.

What differentiates KRR Heavy Engineering from other competitors in the market is the experience and a highly proactive and efficient team with outstanding technical knowledge and synchronous coordination. The organization has state-of-the-art infrastructure and facilities to execute projects and ensures assured quality services and processes to deliver projects within the set time frame. To ensure superior quality, the firm ensures that the right engineering is executed and follows a rigorous operations procedure sequence. The in-house quality team strives to implement and execute a quality assurance plan and along with this, conducts quality control tests for raw materials and completed equipment. "We have more than 40 quality certifications from various countries including the American Society for Mechanical Engineers. We, at KRR Heavy Engineering, strive to infuse new and innovative practices before initiating a project and also try to critically analyze and implement new processes to the projects", asserts Prakash, General Manager, KRR.

KRR Heavy Engineering has a team of 200 staff and 300 workers comprising engineers, quality team, production team, planning team, and more. The organization has a good mix of young

Sakthivel Ramaswamy
CEO

and experienced professionals which enables it to leverage out-of-the-box thinking and expertise from seasoned professionals. KRR Heavy Engineering works on a more collaborative and team-oriented principle rather than the conventional hierarchical fashion. This has enabled the organization to gain clientele in a vast array of industry verticals and execute projects for National Aluminum Company (NALCO), Indian Farmers' Fertilizer Cooperative (IFFCO) in Paradip, NAL (Bengaluru), Indira Gandhi Center for Atomic Research in Kalpakkam and has also supplied autoclaves to leading PSUs such as Bharat Electronic, IIT- Chennai and an Indian institute of Science apart from various private organizations.

In the rapidly evolving world of technology, KRR heavy engineering aims to implement partial or complete automation of production plants. The organization also wants to diversify its product portfolio. KRR Heavy Engineering exports products to more than 30 countries and looks forward to setting up offices in European and the American market to cater to the clients in these markets.

INDUSTRY INSIGHTS

'MAKE-IN-INDIA' INITIATIVE IN THE MANUFACTURING SECTOR: THE NEED TO BUILD & MAINTAIN MOMENTUM

By Prasanth Sakhamuri, *Managing Director, Hind High Vacuum Company*

Prasanth Sakhamuri
Managing Director

Prasanth is leading the most advanced and capable vacuum technology company in india for over three decades and holds experiences as an entrepreneur, business development manager, product development engineer, technologist and more.

The Make-in-India initiative is the start of a whole program to develop significant manufacturing capability within the country. The aim is toincrease the contribution of the manufacturing sector to GDP to at least 30 to 35 percent from its existing level of 16 to 17 percent. India with its very large population will be a major consumer and will always be a market formany FMCG, automotive, consumer and industrial organizations.

After being announced in October 2020, the Make-in-India program has started to see immediate success in the electronics, defence sub-assemblies and manufacturing of intermediaries for pharmaceuticals verticals. In addition, the solar cell and module business is also seeing success as the tariff imposed on imports isdriving production and competitiveness of the local industry.

To sustain this initial success and continue with the growth of this sectors the support of the government with the appropriate policy and infrastructure is required in a large dosage. Indian manufacturing competitiveness will improve with trained manpower and also with strong policies that will enhance the productivity of the existing workforce.Policy should be able to enhance gender diversityon the manpower frontandensurebackwardintegrationaswelacktotalcapability in core raw material manufacturing on the technology front.

Post COVID many internal organizations looked for alternatives to China. While India has a large population there is a huge deficit in trained manpower and effective skilling programmes. According to the Economic Survey of 2016-17, manufacturing of low cost goods (shoes, clothes and more) have been moving out of China for half a decade to countries like Sri Lanka, Vietnam and Bangladesh.When comparing the competitiveness of Vietnam and Bangladesh to Indian manufacturing it needs to be understood that in the high technology space India has an advantage

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due to large investments into engineering and scientific education and research institutions. With regards to low-cost manufacturing which requires high productivity and disciplined workforces India still lags behind as the population is highly unskilled and the cost of labour in India is comparatively higher in comparison to neighbors like Vietnam and Bangladesh. It will be quite a while before we can get absolutely competitive and this can be achieved only by government policy support and infrastructure support.

The Indian small and medium manufacturing enterprises have been the backbone of the Indian economy for most of the last three decades, however they are non-competitive on an international platform due to sheer lack of scale.

To improve the skills and to make the MSME segment in India competitive, it is important that they start working in consortiums, and have coordination committees, which will be able to optimise and pool the strength of member companies together and develop scale. Consortium working will also help in sharing skills and building capability. Financing will continue to be a major issue as the Indian banking system is aggressively focussed on securities and collateral for small lending. These loans and funding to MSME consortiums should be guaranteed by the government similar to what was done during the COVID revival to help modernise and install more automation. Availability of low cost and speedy access to funds will go a long way in ensuring that MSME's become competitive and also innovative.

Automation will help MSMEs become more flexible and manufacture products to the required qualities expected to do business internationally. In addition MSME's working in consortiums will be able to provide holistic solutions rather than partial products making them more competitive and preferred. These industries service a huge market in India. Post COVID demand has increased very aggressively for Indian companies. In the present political climate across the world, India enjoys a very unique geopolitical situation. It is looked at as an alternate manufacturing base to China if not on the same scale asat least an alternative.

> **To improve the skills and to make the MSME segment in India competitive, it is important that they start working in consortiums, and have coordination committees**

Ongoing world events have disrupted supply chainsmaking it difficult to get things going smoothly in the short run. The disruption is prevalent across the world. It is important at such times to be transparent and open on the challenges being faced and work towards finding alternative materials and supplies to keep pace with the demand. Overall, the future of Indian manufacturing is highly positive; we have a large workforce where once we develop skills will be highly capable. We have a young population who can work hard and be trained to have the right capability. Indian manufacturing should adapt to produce volumes and setup large factories. We need to have laws and rules which are adaptable to employee large volumes of people and there should be a clear trust between government and industry.

From the manufacturing side it has to ensure that there is no wasteful expenditure and raw materialis properly utilised to ensure competitiveness. MSMEs and other industries should automate and be analytical to ensure inventory is optimised and continuous innovation is in place for cost reduction and being competitive. Consortium working of smaller companies to provide total solutions to customers would also go a long way in pooling together entrepreneur resources. In


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AFTERWORD

FIVE MAJOR STEPS TO EASILY AUTOMATE YOUR PROCUREMENT PROCESS

By Arun Krishnamoorthy, *CMO, Techpanion*

Arun is an Experienced Techno-Commercial Professional, with a demonstrated history of working in IT sector. Skilled in Marketing, Solution Selling, Business Modelling, Customer Relationship Management, Strategy and Business Process Reengineering.

Procurement is a crucial aspect of businesses. It plays a vital role in expansion and optimization of industries therefore it involves obtaining goods and services including sourcing, negotiating terms, making purchases, tracking when supplies are received and maintaining records. When all the parts are done efficiently, it leads to increased business profitability and archived targets. It's important to monitor and recheck the procurement process to ensure best results.

1. Digitize Supplier On-boarding

This is the process of gathering information and data needed to set up an organization as an approved vendor or supplier. This step enables any company to efficiently conduct business, purchase goods and services, and make payments to said supplier. Supplier on boarding also requires checking the prospective supplier and making sure it is in compliance with laws, regulations and corporate standards of the organization.

2. Automated Contract Management

Automated contract management involves the use of software to enable legal and non-legal teams to self-serve on routine legal documents, and replace the lawyer work with automation software. It can be understood as the process of generating, managing, and storing contracts digitally to create a more efficient contract workflow. It is used to strengthen admin tasks and reduce businesses overheads. This helps businesses by providing a simple contract lifecycle by transforming analog manual processes into a digital automated workflow.

3. Quick Supplier Resolution via Multi-channel Communication

Quick supplier resolution via multi-channel communication means fasten the shareholder resolution process of approving vendors by the Vendor of the Shares, the Comtek Business and the Assets to the Purchaser. Multichannel communication refers to a company's way of communicating with customers over several different platforms, including, social media email, SMS, webinar, personal meet and more helping improve the customer experience.

4. Easy Integration with ERP & other Portals

The easy integration for procurement with Enterprise Resource is an important role to ease the process. It involves a planning business software that simplifies the way businesses track, manage and work with data for managing inter-departmental department management seamlessly. A business might use an ERP to keep track of inventory levels for each of its products and orders.

> **Voice bots are gaining mainstream use in every corporate industry and transforming human-machine interaction**

5. Track Master Data & Actionable Insights

Track master data and actionable insights absolutely essential for procurement and running operations within a business enterprise or unit. Tracking master data is the coding system which specifies the item level. It helps list each product and service with its own standardized, generic description accurately and uniformly by expert analysts.


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