

“TCE eyes significant potential in the US market.”

As part of its strategy to significantly expand globally, Tata Consulting Engineers (TCE), a 63-year-old consultancy, is set to bring the best Indian engineering thought leadership to the US, says **Amit Sharma**, CEO & MD. In a candid interview with **INFRASTRUCTURE TODAY**'s Manish Pant, Sharma emphasises the importance of policy stability and a long-term approach to ensure India maximises the benefits of the China Plus One strategy for the exponential expansion of infrastructure and allied sectors.

How do you balance your principal role as an engineering consultancy with the additional challenge of acting as an engineering, procurement, and construction management (EPCM) firm for your diverse clientele?

We have been in India for 63 years and are now the largest EPCM firm, diversified across sectors like metal mining, power, chemicals, digital, and infrastructure. This diversification, coupled with our skilled teams, allows us to connect with multiple sectors and take a holistic approach. For example, understanding how trends like electric vehicles (EVs) impact infrastructure, chemical, automotive, and manufacturing sectors helps us map out industry implications. Our core focus is EPCM projects, but we also excel in thought leadership. We conduct detailed assessments from concept to execution, creating bankable reports and aiding clients in raising capital. Our in-house design, engineering, and project management ensure comprehensive solutions. Clients seek us not just for project execution but for insights into trends and technologies. Our strategy combines consultancy, trend analysis, and thought leadership with hands-on project execution, making us a trusted partner for diverse sectors.

While India has significantly expanded its infrastructure in the past decade, do you believe this is just the tip of the iceberg, considering the immense demands of the population and economic growth?

India's growth must be infrastructure-led. As



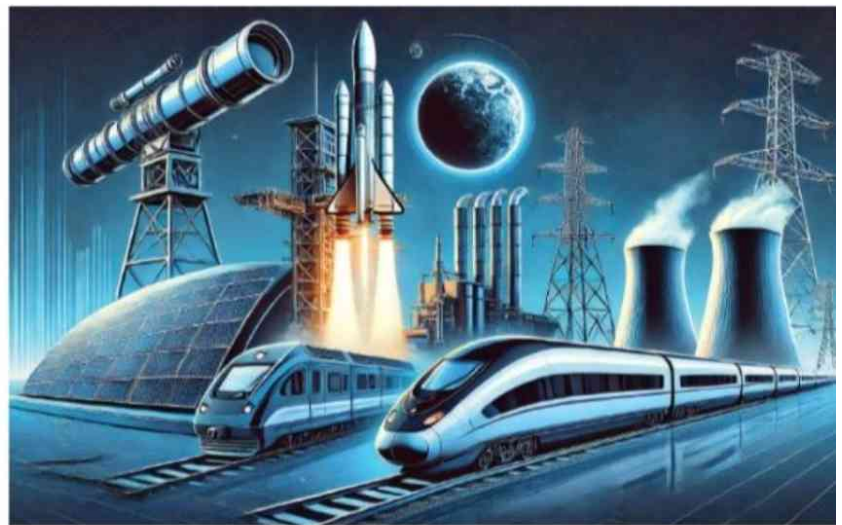
Amit Sharma, CEO & MD, Tata Consulting Engineers

you correctly mentioned, current developments are just the tip of the iceberg. We need housing, connectivity, and better roads for goods transportation. Despite a dedicated rail freight corridor, logistics and transportation have immense potential. As India's population moves towards the upper middle class, improved infrastructure is essential. Over the past decade, there has been significant progress in mass housing and integrated mobility, and this will continue for decades. We need better infrastructure across all city tiers, clean cities, sewerage systems, hospitals, schools, and

housing. Our population is a strength, driving GDP growth and internal consumption, which is on the rise. While exports are crucial, internal consumption will drive economic growth. The 'Make in India' initiative spans semiconductors, chemicals, defence, space, and aerospace. We are excited about how internal consumption and export-oriented approaches are shaping India's future.

What are the primary subsegments within infrastructure driving TCE's growth, and which new areas do you foresee propelling it into the future?

Over the past couple of years, we have witnessed significant private capex commitments for the first time. The momentum started more than five years ago, before the COVID [pandemic] hit, leading to a wait-and-watch situation. This period allowed companies to conduct more research. Post-COVID, there was a sudden demand, and we were able to leverage that. For instance, steel, aluminium, and copper production are core sectors aligning with India's growth requirements. Copper is essential for electrification, aluminium for EVs and lightweight materials, and steel for construction activities and railway modernisation. The demand for cement is also on the rise. In the next five years, India's steel capacity is set to triple, cement capacity double, and aluminium capacity triple. This domestic capability is bolstered by external perceptions of stability, attracting FIIs and FDI. While the China Plus One strategy is discussed, real action is happening in India due to its stable growth platform. The country's consistent 6.5-7 per cent growth rates are unmatched globally. TCE has grown 20-25 per cent year-on-year over the last three to four years, and this trend continues. There is substantial demand across industry value chains for core engineering work, new plant manufacturing units, batteries, solar, chemicals, speciality chemicals,



semiconductors, metal mining, and more.

Besides making strategic acquisitions like the recent purchase of the US-based design firm CDI Engineering Solutions, what other strategies are you considering to expand TCE's overseas business?

In the last ten years, we have grown TCE from virtually zero exports to about 35-40 per cent of our revenues in international markets, primarily in the Middle East, Southeast Asia, Europe, and Africa. The US market, though large, has specific requirements like signatory state permits and private equity. Our US acquisition is based on three principles: the US is the largest unfragmented single market with the biggest GDP; it has a strong talent base and demand in semiconductors, solar, and chemicals; and it offers good Indo-US collaboration opportunities for a resilient supply chain. Expanding internationally is not just about numbers but also about market and talent availability. The US market aligns well with our [expansion] strategy, and we see significant potential for growth. Engineering relies on thought leadership and converting

▲ Since its founding in 1962, TCE has provided services to diverse sectors such as construction, transport, energy and space technology.

 <p>Engineering of India's first semiconductor Plant (2024)</p>	 <p>Engineering of India's first solar PV glass plant (2024)</p>	 <p>Detailed engineering of the world's first green ammonia project (2022)</p>	 <p>Project management consultancy (civil) for the Mumbai and Ahmedabad high-speed rail project (2021)</p>	 <p>Engineering review of the 182-meter tall Statue of Unity (2019)</p>
---	--	--	---	---

Tata Consulting Engineers: Brick-by-Brick

- **Founded:** Established in 1962 as joint venture between the Tata Group and the US-based Ebasco Services. Today, it is a 100% subsidiary of Tata Sons, part of the \$165 billion Tata group.
- **Competency:** An integrated engineering consultancy firm, specialising in services across the entire project lifecycle, from concept to commissioning.
- **Operations:** Active in key sectors like power, infrastructure, and resources, i.e., hydrocarbons, chemicals, mining, and metallurgy.
- **Capabilities:** Managing complex projects worldwide, building cost-effective and environmentally friendly solutions, providing niche services tailored to client needs, and engineering solutions for the Industrial Internet of Things (IIoT).
- **OEPC Model:** Operates on an owner's engineer and project consultant (OEPC) model, offering end-to-end engineering solutions that span feasibility, design, execution, and operational support.
- **Global Presence:** Over 12,000 projects delivered across 65+ countries.

Source: Company, IT Research

ideas into the physical world, and the US has a talent deficit that we can help address.

With so much conversation around concrete, are you also making efforts towards sustainable utilisation of the commodity?

We approach sustainability in three key ways. First, we have a subsidiary called Ecofirst Services, a niche company with about 300 people dedicated to sustainable infrastructure. They focus on sustainable design, calculations, and energy analysis. Second, we use energy and carbon calculators to achieve optimal efficiency while adhering to codes and standards. This involves using methods like precast and prefab construction. Third, we emphasise the circularity and reusability of materials, which is currently at an academic and industrial stage. We are exploring how to recycle materials like metal, aluminium, steel, chemical waste, mining tailings, and demolition waste. The goal is to innovatively reuse these materials to create the concrete of the future. While the first two approaches are already integrated into our daily work, the third is in the early stages of development.





With initiatives like the Skill India Mission underway towards developing future-ready manpower, how can the emerging opportunities be maximised to address the concern of potential redundancy in certain roles within the infrastructure sector?

India faces the twin challenge of providing

viable, long-term, sustainable employment while ensuring a skilled workforce. Infrastructure and manufacturing initiatives will generate job demand, but we must have sufficiently skilled manpower. Training this workforce has been challenging, as manufacturing and infrastructure require tougher conditions compared to our traditional service economy in IT and banking. India must focus on polytechnics, skill development, and MSMEs (micro, small and medium enterprises) to make these jobs appealing, despite their physical and environmental challenges. Government policies and the private sector must invest in training high-quality manpower to achieve global benchmark infrastructure and manufacturing capabilities. Our project requirements across India necessitate a cluster-based approach, similar to SEZs (special economic zones) and STPs (software technology parks), where multiple companies can collaborate and share resources. Clusters for semiconductor and chemical companies, for instance, will allow for concentrated training and support. Fragmentation across India makes labour workforce movements difficult. Additionally, we need a structured approach to projects and manufacturing, with proper timing for design engineering followed by construction. This will reduce delays caused by poor planning or initial estimates and make the value chain more attractive to younger talent. Balancing life and work in challenging environments will encourage the next generation to adopt these professions. Lastly, instead of producing 1 million engineers, we should train 200,000 engineers and 500,000 highly skilled polytechnic workers. This approach will ensure a workforce that contributes to high-quality manufacturing and infrastructure, addressing the concern of potential redundancy in certain roles within the infrastructure sector.

Engineering has traditionally been viewed as a male-dominated field in India. With more women entering the profession, how do you see this perception changing, and what steps is TCE taking to promote gender diversity?

We have our initiative on gender diversity at TCE. For example, we are one of the largest recruiters in pure engineering, taking about 1,000 people each year from engineering colleges and diploma programmes. While ensuring meritocracy, a minimum of 25 per cent of our recruits are women graduate engineers and trainees. We also have internal mechanisms to help women balance

				
<p>Design engineering for Tata Lockheed Martin Aerostructures and Tata Boeing Aerospace plants (2018)</p>	<p>Design and engineering of the launch pad for the GSLV rocket in partnership with ISRO (2016)</p>	<p>Gujarat state water and wastewater urbanisation project (2014)</p>	<p>Engineering services for Sultan Iskandar Combined Cycle Power Plant in Malaysia (1996)</p>	<p>Design and engineering of India's first indigenously built 2.3m optical telescope at Kavalur (1986)</p>

their home and office requirements. Certain areas that require precision, focus, and quality see a preference for our women colleagues, who perform exceptionally well. Over the past two decades, we have observed an increasing number of women entering core engineering fields like mechanical, civil, and electrical engineering. We are finding good female candidates in colleges, being a day-zero, day-one company, and we recruit from women-only engineering colleges and skill institutes. Creating a friendly and conducive work environment, along with strong policies on POSH (Prevention of Sexual Harassment) and ethics, inherited from the Tata group, is crucial. Across India, if these environments are provided, our women workforce can propel the nation and the youth to equal proportions. While progress has been made over the last 12 months, it is still at an early stage.

Despite the positive growth projections, certain roadblocks continue to hamper the Indian infrastructure sector. What are the key barriers, and how can they be effectively resolved?

Despite positive growth projections, several roadblocks hamper the Indian infrastructure sector. While subsidies like PLI (Production Linked Incentive) or ISM (India Semiconductor Mission) have shown results, other sectors could leverage innovative approaches such as manufacturing, production, or offtake-based subsidies to propel growth. Policy stability and a long-term approach are essential. For instance, hydrogen or green steel policies must remain consistent to attract private investment. Land acquisition continues to plague new projects, requiring a standardised approach. Balanced growth across India's regions, facilitated by a central body with a policy framework, will prevent urban chaos and ensure optimal land use with necessary resources like water, electricity, and

connectivity. Skilled manpower focusing on blue and white collar jobs is another critical aspect. Training and investing in high-quality manpower are vital to achieving global benchmark infrastructure and manufacturing capabilities. Without addressing these barriers, competition from countries like Vietnam, Cambodia, and Malaysia could hinder India's ambition of becoming a manufacturing hub. The China Plus One strategy must translate into actionable steps rather than remain theoretical. By tackling incentivisation, land acquisition, and skilled manpower issues, India can realise its infrastructure and manufacturing ambitions.

Just like during the oil boom-fuelled infrastructure creation in the Middle East from the 1970s to 1980s, Indian engineering firms often lost out on lucrative contracts to Japanese and South Korean firms.

Yes, that's true. The advantage or disadvantage in countries like South Korea is similar to the China model, where state-owned enterprises (SOEs) play a significant role. The state has a say in large conglomerates in South Korea and Japan. This state involvement means policy implementation is more straightforward. India follows a free market approach, with the government setting policies and the private sector making decisions. While there are advantages to a free market, transformation with speed requires strong levers. One approach is SOEs, while another is about creating stable, long-term policies that provide a tangible internal rate of return and a business case for private investment in big capex. India cannot adopt an SOE model, but we need stable policies. The private and public sector enterprises are keen on this, and our internal markets can drive growth. Export is an add-on. We have the capital and stability, but policy stability is essential.

