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THE CHIEF EDITOR'S TAKE



Editor-in-Chief

Tejasvi Sharma
tejasvi@epcworld.in

Associate Editor

Sahar Khan

Assistant Editor

A. Mohankumar

Consulting Editor

Veena Kurup

Head-Marketing & Communications

Sriniwas Kumar
sriniwas@epcworld.in

Head-Business Development

Venkatesh K

GM-Sales & Mktg

Santosh Rai

Business Development (Delhi)

Brijender Kumar

Design

Vishwas G. Machivale

Branch Office: Ahmedabad (Gujarat)
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Dear Readers,

As we usher in the March 2025 edition of EPC World, we find ourselves at a defining moment in the landscape of infrastructure, engineering, and construction. This era stands as a beacon of groundbreaking innovation, visionary leadership, and transformative progress, driven by a relentless pursuit of excellence. This month, we are proud to present a detailed account of the 11th edition of the EPC World Awards, a celebration of exceptional individuals and organizations whose pioneering contributions are reshaping the future of urban infrastructure.

The EPC World Awards ceremony was more than just an event—it was a powerful reminder of the strength of leadership and collaboration. Over 30 trailblazing leaders, whose accomplishments have left an indelible mark on the industry, were honored for their exceptional contributions. The evening not only celebrated their personal achievements but also spotlighted the collective force driving the infrastructure sector forward. As we delve into their journeys, a common thread emerges: an unwavering commitment to sustainable development, a passion for innovation, and a vision that is steering the industry toward a brighter, more resilient future.

Beyond the accolades, the event highlighted the importance of fostering collaborative dialogue among industry experts. The India Infra Forum 2025 proved to be an invaluable platform, with discussions rich in insights as experts explored critical issues in urban mobility, including metro rail, regional rapid transit systems (RRTS), airport infrastructure, and more.

In addition to celebrating achievements in urban mobility, this issue also shines a spotlight on other critical sectors within India's infrastructure ecosystem. We take an in-depth look at the oil and gas sector, a cornerstone of India's energy infrastructure, and examine the growing role of Pre-Engineered Buildings (PEBs) in the construction sector. The rapid adoption of PEBs for their speed, cost-effectiveness, and sustainability marks a new chapter in how India is approaching infrastructure development, particularly in logistics, e-commerce, and industrial projects.

With cutting-edge solutions, expert insights, and thought leadership driving the dialogue, we at EPC World are excited to contribute to shaping the future of infrastructure. We hope this issue will ignite new conversations, inspire action, and help forge the partnerships that will drive the evolution of our urban landscape toward greater sustainability and resilience.

Enjoy the read!

Tejasvi Sharma



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CELEBRATING THE TRAILBLAZERS

Shaping the Future of Infrastructure

The 11th edition of the EPC World Awards brought together over 30 trailblazing leaders and innovators, honoring their exceptional contributions to the infrastructure, engineering, and construction sectors. Organized by EPC World Media Group, the event celebrated visionaries who are not only driving industry growth but also shaping its future, setting new standards of excellence and transformation across the sector...

VOICES OF EXCELLENCE

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No matter the challenges, we must always strive to accomplish our goals
RAJESH KUMAR SINGH
CMD
Bridge and Roof Company (India)



While time and cost are often the focus, we must equally emphasize safety, quality, and sustainability
VINAYAK PAI
MD & CEO
Tata Projects



Keep pushing boundaries, stay curious, and understand the impact of your work
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Executive Vice President & CTO
ITD Cementation India



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The future of urban mobility



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PEB

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Form IV

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Nationality : Indian
Address : Pent House No. 1, Plot No. 61, Sector-26,
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I, Tejasvi S Sharma, hereby declare that all particulars given above are true to the best of my knowledge and belief.

Sd/.

(Tejasvi S Sharma)

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JK Tyre expands its retail footprint in Gujarat with its new Truck Wheels centre in Gandhidham

JK Tyre & Industries has inaugurated a new JK Truck Wheels Centre in Gandhidham, marking a significant step in its growth and market expansion. Operated by Aadinath Tyres, the facility was inaugurated by Anshuman Singhania, Managing Director, JK Tyre & Industries, reaffirming the company's dedication to delivering premium products and services to the commercial vehicle sector. With Gujarat being a major hub connecting key industrial and trade corridors, the JK Truck Wheels centre is strategically located at Gandhidham which is well connected to national highways and is in close proximity to Mundra and Kandla ports making it a key logistics and trade hub. This state-of-the-art facility is designed to meet the evolving needs of fleet operators and transporters. Equipped with cutting-edge technology, it offers a comprehensive range of JK Tyre's premium commercial vehicle tyres and advanced services, including computerized wheel alignment, tyre rotation, and tyre health monitoring. Additionally, expert technical advisors are available to help customers optimise tyre performance and reduce operating costs.

BLR Airport and Menzies Aviation launch India's largest domestic cargo terminal

Kempegowda International Airport Bengaluru (KIAB/BLR Airport), operated by Bangalore International Airport (BIAL), has partnered with Menzies Aviation to redefine domestic cargo operations with the launch of India's largest Greenfield Domestic Cargo Terminal (DCT) in terms of designed capacity. This 245,000 square feet state-of-the-art facility signifies a major milestone in BLR Airport's cargo handling capabilities, offering enhanced infrastructure and streamlined processes to meet the growing demands of the domestic market. It will play a key role in connecting industries, strengthening supply chains, and driving innovation toward a more sustainable future for domestic cargo and regional trade, positioning BLR Airport as a leader in cargo handling. With the launch of this dedicated domestic cargo terminal, BLR Airport reinforces its position as a leader in innovation, efficiency, and sustainability within India's air cargo landscape. As air cargo demand continues to rise, this terminal is set to be at the forefront, ready to meet the challenges and opportunities ahead.

Hitachi Hi-Rel Power Electronics concludes successful participation at ELECRAMA 2025

Hitachi Hi-Rel Power Electronics (Hitachi Hi-Rel) has successfully concluded its participation at ELECRAMA 2025, World's Largest Electrical and Allied Electronics Show in India, held at the India Expo Centre, Greater Noida, UP, India. The Hitachi Hi-Rel stall was inaugurated by Shinichi Aida (Division Director & General Manager - Electrical Systems Sales & Marketing Division) from Hitachi Industrial Products, Japan. The exhibition provided a valuable platform for Hitachi Hi-Rel to showcase its cutting-edge power electronics products and solutions, including Industrial UPS: Highlighted i4eti Model 160 kVA AC UPS with i4 Series & i6et UPS Advanced Prototype Models. IT & Infra UPS: Featured the HM33 Series - HM-33-60-3X Modular UPS Model. Grid-Tied Solar String Inverters: Demonstrated the HIVERTER SI-350K Model. Medium Voltage Drives: Showcased the advanced technology of the HIVECTOLE and HIVECTOLE-E2 Series through Advanced Prototype Models. Low Voltage Drives: Featured the VJ-C1N (15 kW), SH1 (37 kW) and SJ-IN1 (315 kW) products.

Hitachi Hi-Rel's stall (booth) H1A2 was a major attraction at ELECRAMA 2025, garnering significant attention from industry experts and media. The company's commitment to innovation and customer satisfaction was well-received by attendees. The exhibition witnessed strong engagement with industry professionals with numerous visitors expressing keen interest in Hitachi Hi-Rel's power electronics products and solutions. The company received a significant number of inquiries and leads, demonstrating a strong demand for its products and services.

Motherson becomes Tier 1 supplier to Airbus commercial aircraft

Motherson, a global manufacturer of aerospace components and assemblies, has announced that it has been selected as a Tier 1 supplier to Airbus commercial aircraft, a leading aircraft manufacturer. Motherson (via its subsidiary CIM Tools India) has signed a multi-year contract to manufacture and deliver a range of aerospace components and assemblies directly to Airbus' final assembly lines. The supplies will commence from a Motherson's specialised aerospace facility based in Bengaluru, India. Motherson is already a Tier 1 supplier for Airbus Helicopter and Airbus Defence and Space.

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Dalmia Bharat to add 6 MnTPA cement capacity in Maharashtra & Karnataka

Dalmia Bharat, through its subsidiaries, has announced a strategic investment of approximately ₹3,520 Crore in the states of Maharashtra and Karnataka. As part of this initiative, the company will establish a 3.6 MnTPA clinker unit and a 3 MnTPA grinding unit at its existing Belgaum plant, Karnataka coupled with a new greenfield split grinding unit with a capacity of 3 MnTPA in Pune, Maharashtra. The capex will be funded through a combination of debt and internal accruals. With this expansion, Dalmia Bharat's total installed cement capacity will increase to 55.5 MnTPA, after considering the ongoing expansion of 2.9 MnT at Assam and Bihar. These new units are expected to be commissioned by Q4 FY27. The Belgaum Grinding Unit will cater to the underserved Southern Maharashtra markets while enhancing share in the existing region by improving penetration. On the other hand, Pune Grinding Unit will entirely cater to the untapped Western Maharashtra markets. The initiative is a part of the company's vision to be a PAN India player and achieve 75 MnTPA capacity by FY28 and 110-130 MnT by 2031.



BPCL to buy propane and butane from Equinor India

Bharat Petroleum Corporation (BPCL) has entered into a strategic agreement with Equinor India, a 100% subsidiary of Equinor ASA, for the purchase of propane and butane for a period of one year. The agreement ensures a reliable supply of these key petrochemical feedstocks at competitive commercial terms, reinforcing BPCL's commitment to securing energy resources efficiently. This collaboration marks a significant step in strengthening the partnership between BPCL and Equinor, supporting India's growing demand for energy and petrochemical products.

Godrej Enterprises Group secures order for geothermal condenser

The Process Equipment business of Godrej Enterprises Group, has secured its first order for an Advanced Direct Contact Condenser (ADCC) based on its in-house Eco-laure® technology for a geothermal power project in the Asia-Pacific region. The equipment will be manufactured and dispatched from their world-class manufacturing facility in Dahej, Gujarat. The Advanced Direct Contact Condenser is used to condense steam from the turbine exhaust by mixing it with cooling water. Unlike surface condensers, which use heat transfer through tubes, ADCC directly mixes steam and cooling water, allowing for efficient heat exchange and condensation. It also allows for higher plant efficiency as the back pressure on the turbines is reduced thus increasing the power output. It can be designed for lower condenser pressure and/or less cooling water flow which helps in reducing the size of other major components.

Advait Energy Transitions bags contract to supply and service ERS from Parbati Koldam Transmission Company

Advait Energy Transitions has secured a significant order for the supply and service of an ERS from Parbati Koldam Transmission Company. This contract involves delivering ERS solutions for 2 X 400 kV Single Circuit (S/c) Parbati –Koldam Transmission Line and 400 kV Double Circuit (D/c) Koldam – Ludhiana Transmission Line. Under the terms of the agreement, the project will be executed within 10 months, reinforcing Advait Energy Transitions' commitment to providing high-quality, reliable, and rapid restoration solutions for critical power infrastructure. The ERS plays a vital role in ensuring grid reliability and minimizing power outage durations, thereby supporting uninterrupted power supply across key transmission networks.

Embassy REIT to invest ₹100 crore to support Bengaluru's metro expansion



Embassy Office Parks REIT has committed an investment of ₹100 crore to fund the Metro ORR Project, supporting Bengaluru's urban infrastructure development. The investment will contribute to the construction of the Kadubeesanahalli Metro Station on the Outer Ring Road (ORR), which will be named "Embassy TechVillage Kadubeesanahalli Metro Station" for a period of 30 years from its commercial operation date. Embassy REIT and Bangalore Metro Rail Corporation (BM-RCL) signed a definitive agreement on February 28, 2025, for the development of this new metro station along the ORR corridor. The Metro ORR Project, undertaken by BM-RCL, is a major infrastructure initiative that spans 17 km from Central Silk Board Junction to K.R. Puram. This corridor, which includes 16 stations, aims to enhance connectivity for thousands of commuters in Bengaluru's key business districts, including the landmark Embassy TechVillage business park.

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Volvo Trucks launches India's first Road Train solution

Minister of Road Transport and Highways, Nitin Gadkari, flagged off India's first Road Train in Nagpur. Developed by Volvo Trucks and operated by Delhivery, this pioneering solution marks a new era for long-haul transportation, enhancing efficiency and capacity in the logistics industry. The Road Train concept was formally incorporated into regulations in 2020, allowing for vehicle lengths up to 25.25 meters. A Road Train consists of a tractor unit towing two or more trailers, significantly increasing cargo capacity. Volvo Truck's Road Train features the industry-leading Volvo FM 420 4x2 tractor, a 24-ft containerized intermediate trailer, and a 44-ft semi-trailer, delivering a combined cargo volume of 144 cubic meters—50% higher than standard semi-trailers. Following successful completion of rigorous testing and trials, Volvo FM 420 4X2 Road Train is certified by MoRTH and ARAI for operation between Delhivery hubs of Nagpur and Bhiwandi. The Volvo FM 420 4X2 Road Train is equipped with advanced safety features, including Electronic Braking System (EBS) and Electronic Stability Program (ESP), 360-degree camera system, self-steerable axle on the trailer, dashboard load monitor, downhill cruise control, stretch brake for enhanced stability and control to name a few.

New waterway regulations set to open new opportunities for private players in IWT sector

In a significant move to enhance infrastructure development and improve the ease of doing business, regulations have been put in place for the establishment of jetties and terminals by various entities, including private, public, and joint ventures, on national waterways across the country. The National Waterways (Construction of Jetties/Terminals) Regulations, 2025, formulated by Inland Waterways Authority of India (IWAI) under the Ministry of Ports, Shipping and Waterways (MoPSW), are designed to attract private sector investment in setting up terminals, streamline processes and promote efficient use of India's vast waterways network. By enabling entities, including private players, to develop and operate jetties and terminals, these regulations open up new opportunities for investment, trade, and economic growth, while also improving logistical efficiency. This initiative is expected to contribute to the reduction of transportation costs, enhance cargo movement, and support the overall growth of the inland waterways sector, positioning it as a key driver of nation's economy.

Credit Fair gets \$5 million fund; to propel rooftop solar financing in India

Credit Fair, a non-banking financial company (NBFC) having significant presence in the solar and MSME segments, has successfully raised \$5 million in debt from the \$75-million Green Basket Bond issued by Symbiotics Investments. The bond, which is the second of its kind, was issued by Symbiotics Investments and subscribed to by British International Investment (BII), the UK's development finance institution and impact investor, and aims to drive the adoption of renewable energy solutions across Asia and Africa. The new funding will strengthen Credit Fair to expand its presence in the rooftop solar financing space, primarily targeting residential as well as MSME customers, including housing societies, in tier-2 and tier-3 cities. Credit Fair will deploy the \$5-million to address the growing demand for rooftop solar installations, empowering underserved communities with affordable and accessible financing options.

Amitava Mukherjee assumes office as CMD, NMDC

Amitava Mukherjee has assumed office as the Chairman and Managing Director (CMD) of NMDC. A seasoned officer from the 1996 batch of the Indian Railway Accounts Services (IRAS), Mukherjee has served the Government of India in various capacities before ascending to the apex leadership of NMDC. With his visionary leadership, Mukherjee has been guiding NMDC as the CMD (Additional Charge) since March 2023 and Director (Finance) since November 2018. He also serves as the chairman of NMDC Steel and Legacy Iron Ore. In his leadership, NMDC has achieved the historic milestone of becoming the first iron ore mining company in India to surpass 4.5 million tonnes output in FY24. He has steered NMDC to its highest ever turnover and net worth in company history, adopted cutting edge digital and technical infrastructure, and resumed operations at the only mechanized diamond mine in the country. He has played a defining role in the commissioning of the NMDC Steel Plant which now stands tall as the pride of Bastar. Led by him, the company has made inroads in gold mining in Australia and laid a visionary international expansion blueprint towards becoming a global mining powerhouse.





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Rafael in JV with L&T to jointly offer TROPHY Active Protection System for Indian Defence Platforms

Rafael Advanced Defense Systems (Rafael) and Larsen & Toubro (L&T) have announced the signing of a Memorandum of Understanding (MoU), during Aero India 2025, aimed at offering of TROPHY Active Protection System (APS) indigenously. TROPHY APS is the only proven and operational APS system in the world. TROPHY is a critical battle-field technology featuring Counter Unmanned Aerial Systems capabilities and defences that enable protection of an entire platform and soldiers. Through this cooperation TROPHY APS shall be offered as a unique solution that can be integrated on India's defence platforms. This collaboration is in line with the Government of India's initiative to forge international collaborations to fast track the indigenisation process for critical and emerging technologies and, aligns with 'Atmanirbhar Bharat' and 'Make in India, Make for the World' vision.



Indraprastha Gas to set up CNG stations at Noida International Airport

Noida International Airport (NIA) has partnered with Indraprastha Gas (IGL) to develop Compressed Natural Gas (CNG) infrastructure at the airport, reinforcing its commitment to sustainable and efficient transportation solutions. As part of the collaboration, IGL will establish two CNG stations - one in the west precinct and second one in the airside area - to cater to travelers, airport staff and partners. IGL will be responsible for the development of the City Gas Distribution (CGD) network at Noida International Airport, ensuring seamless connectivity to and from the CNG stations. The partnership also includes the establishment of a pipeline infrastructure for the supply of piped natural gas (PNG) to various F&B outlets, lounges and kitchens in the terminal and ancillary airport buildings.

India and Nepal Sign MoU to strengthen cooperation in WASH sector

The Government of India and the Government of Nepal have signed a Memorandum of Understanding (MoU) to enhance cooperation in the Water, Sanitation, and Hygiene (WASH) sector, including waste management. The signing ceremony took place at Sushma Swaraj Bhawan, New Delhi, in the presence of C R Patil, Union Minister of Jal Shakti, Government of India, and Pradeep Yadav, Minister of Water Supply, Government of Nepal. The agreement aims to promote collaboration between the two nations and strengthen intergovernmental cooperation in the WASH sector, ensuring better access to clean drinking water and sanitation for their populations. The comprehensive MoU outlines a collaborative framework encompassing several key areas including training programs for Nepali personnel in water resource management and related fields, sharing of technological expertise and best practices between India and Nepal in WASH sector, and joint efforts in monitoring, assessment, and management of groundwater resources, including quality improvement, artificial recharge, and rainwater harvesting.



ONGPL to acquire Ayana Renewable Power

ONGC NTPC Green (ONGPL), a 50:50 joint venture between ONGC Green (OGL) and NTPC Green Energy (NGEL), has signed a Share Purchase Agreement (SPA) to acquire a 100% equity stake in Ayana Renewable Power (Ayana). The agreement was signed with National Investment and Infrastructure Fund (NIIF), British International Investment Plc (BII) and its subsidiaries, and Eversource Capital. The transaction is valued at INR 195 billion (USD 2.3 billion). Ayana, a leading renewable energy platform, has approximately 4.1 GW of operational and under-construction assets, strategically located across resource-rich states. Its portfolio is backed by high-credit-rated off-takers such as SECI, NTPC, GUVNL, and Indian Railways. This acquisition marks ONGPL's first strategic investment since its inception in November 2024, underscoring its commitment to accelerating the renewable energy transition. The deal aligns with the broader vision of its parent companies - ONGC and NTPC - to achieve net-zero targets by 2038 and 2050, respectively. ONGPL will now leverage Ayana's platform for further expansion and growth.



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Concrete Kerbing
Machine (MKM-1200)



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Self Loading Transit Mixer



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ONGC Videsh signs MoU with Petrobras

ONGC Videsh has signed a non-binding memorandum of understanding (MoU) with Petróleo Brasileiro S A aimed at assessing opportunities in the areas of upstream, marketing, decarbonization, and low-carbon solutions, among others. The agreement is aligned with Petrobras' strategy to develop partnerships that allow for the sharing of risks and expertise, seeking to strengthen the company as an integrated energy enterprise and contributing to the success of a fair and responsible energy transition.

Union Ministers Nitin Gadkari and Pralhad Joshi flag off first-ever trials of hydrogen-powered heavy-duty trucks from Tata Motors' stable

Union Minister of Road Transport and Highways, Nitin Gadkari, Union Minister of New and Renewable Energy Pralhad Joshi flagged off the first-ever trials of hydrogen-powered heavy-duty trucks launched by Tata Motors in New Delhi. The historic trial, marks a significant step towards sustainable long-distance cargo transportation in the country, as Tata Motors underscores its commitment to leading the charge in sustainable mobility solutions, aligning with India's broader green energy goals. The company was awarded the tender for this trial, which is funded by the Ministry of New and Renewable Energy under the National Green Hydrogen Mission. It marks a significant step forward in assessing the real-world commercial viability of using hydrogen powered vehicles for long distance haulage as well as setting-up the requisite enabling infrastructure for their seamless operation. The trial phase will span up to 24 months and involves deployment of 16 advanced hydrogen-powered vehicles with varying configurations and payload capacities. These trucks, equipped with new age Hydrogen Internal Combustion Engines (H2-ICE) and Fuel Cell (H2-FCEV) technologies, will be tested on India's most prominent freight routes, including those around Mumbai, Pune, Delhi-NCR, Surat, Vadodara, Jamshedpur and Kalinganagar.

Shree Cement inks ₹8,350 crore MoU with Government of Karnataka

Shree Cement has signed a Memorandum of Understanding (MoU) worth ₹8,350 crore with the Government of Karnataka, committing to invest in the state over the next five years. As part of the MoU, Shree Cement plans to establish state-of-the-art cement manufacturing facilities, generating significant employment opportunities and contributing to Karnataka's industrial growth and development. The MoU between Shree Cement and the Government of Karnataka includes the establishment of an Integrated Cement Plant in Kalaburagi, featuring a clinker capacity of 3.5 MTPA and a cement capacity of 3 MTPA. With an investment of ₹2,500 crore, the plant is expected to create approximately 300 direct jobs and commence operations by 2025. Additionally, a Clinker Grinding Unit with capacity of 3 MTPA will be developed in Bengaluru Rural district with an estimated investment of ₹850 crores. The second proposed unit is expected to create 250 direct job opportunities, with operations scheduled to begin in 2028. Further, as part of this MoU, Shree Cement also proposes to establish an Integrated Cement Plant with a clinker capacity of 3.5 MTPA and cement capacity of 6 MTPA (in two phases) at Kalaburagi district. This project entails a proposed investment of ₹5,000 crore and is expected to create 750 direct employment opportunities. The plant is slated for completion by 2030 and aligns with Shree Cement's vision of sustainable growth and operational excellence.



Vedanta Aluminium unveils AI-powered drone for enhanced mine safety

Vedanta Aluminium has introduced its first Artificial Intelligence (AI)-powered drone-based solution for blasting clearance and danger zone monitoring at its Jamkhani coal mine in Odisha. Equipped with cutting-edge software, the AI-powered drone provides real-time aerial views and automatic capturing of movements of humans, animals and vehicles around a 500-meter blasting zone, enabling officials to remotely monitor operations and get automated alerts of any on-ground movement through live streaming. It also facilitates seamless audio communication between officials, the drone pilot, and the blasting officer, ensuring precise coordination and operational efficiency. The drone's AI capabilities enable it to autonomously detect objects and send real-time alerts, providing comprehensive surveillance of blind spots which may not be captured through ground surveillance. In case of unauthorized entry or anomalies, it triggers immediate alerts, allowing for swift corrective action.



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Titagarh Rail Systems secures order from Adani Cement for 16 rakes of wagons

Titagarh Rail Systems has been awarded a significant contract from Ambuja Cements and ACC, part of Adani Cement. The order, valued at approximately INR 537.11 crore, includes the manufacture and supply of 16 BCFCM (Bogie Covered Fly Ash/Cement Wagon) rake wagons with BVCM (Bogie Brake Van Type) wagons, further reinforcing TRSL's leadership in the freight rolling stock sector. The contract underscores TRSL's expertise in designing and manufacturing specialized freight wagons for bulk transportation. The BCFCM and BVCM wagons are designed to optimize the passage of fly ash and cement, ensuring faster and more cost-effective movement of these essential materials. Additionally, it highlights TRSL's ability to deliver customized solutions tailored to the specific needs of its patrons. The execution of this order, scheduled between January 2026 and March 2027, will leverage TRSL's advanced manufacturing facilities and engineering capabilities to ensure the highest standards of quality and timely delivery.



JK Lakshmi Cement expands footprint in northeast India

JK Lakshmi Cement (JKLC) has signed a Memorandum of Understanding (MoU) with the Government of Assam. The agreement, formalized by Arun Shukla, President & Director of JK Lakshmi Cement, in the presence of Chief Minister Himanta Biswa Sarma, marks a major milestone in the company's expansion and commitment to sustainable development. As part of this MoU, JK Lakshmi Cement will invest ₹11,000 crore over the next 7-8 years to develop a Greenfield project dedicated to cement production and value-added products. This initiative underscores JK Lakshmi Cement's dedication to sustainable growth and its contribution to the economic development of the region. By integrating sustainable practices, JK Lakshmi Cement aims to set a benchmark for environmentally responsible industrial expansion in the country. This investment is poised to create thousands of direct and indirect employment opportunities, contributing to the socio-economic development of the region and the nation at large.

Oaktree expands India presence with new office in Hyderabad

Oaktree Capital Management, LP (Oaktree), a leader among global investment managers specializing in alternative investments, opened the doors to its new office in Hyderabad, India, in HITEC City. Oaktree's decision to expand its operations in India underscores its commitment to the region and recognition of the exceptional local talent. This move will enable the firm to attract, retain, and develop Oaktree employees in Hyderabad, and deliver high quality service to both internal and external stakeholders around the world. Oaktree is one of the largest and most active investors in Indian private credit, having deployed more than US\$4 billion since 2018. The Hyderabad office is Oaktree's second in India, following the Mumbai office, which opened in 2023 under the leadership of Gaurav Parasrampur, Head of Asia of Oaktree's Global Opportunistic strategy.



ONGC and Tata Power Renewable Energy to collaborate on battery energy storage solutions

Oil and Natural Gas Corporation (ONGC) has signed a non-binding Memorandum of Understanding (MoU) with Tata Power Renewable Energy (TPREL), a subsidiary of The Tata Power Company, to explore collaborative opportunities in the Battery Energy Storage System (BESS) value chain. The MoU was formalized at India Energy Week 2025 in the presence of Deepesh Nanda, CEO & Managing Director, TPREL, and other distinguished dignitaries. This strategic partnership underscores ONGC's commitment to enhancing India's energy security through the integration of renewable energy and advanced storage solutions.



The collaboration will explore a range of applications across the BESS value chain, including Utility-scale energy storage systems, Grid stabilization and ancillary services, Renewable energy integration and hybrid solutions, Industrial and commercial energy storage applications, Microgrid and backup power solutions and Electric vehicle (EV) charging infrastructure.



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CONTACT

FOR EXHIBITION:

Navneet Gupta - Consultant, FICCI

M: +91-9654103029

E: navneet.gupta@ficci.com

Nachiket Basole - Deputy Director, FICCI

M: +91-9867312834

E: nachiket.basole@ficci.com

MUMBAI OFFICE

Narendra Naik - Deputy Director, FICCI

M: +91-9819501719

E: narendra.naik@ficci.com

BANGALORE OFFICE

B. K. Nayak - Additional Director, FICCI

M: +91-9945790735

E: bk.nayak@ficci.com

FOR REVERSE BUYER SELLER MEET (RBSM):

Sudhanshu Gupta -

Joint Director, FICCI

M: +91-9873311557

E: sudhanshu.gupta@ficci.com

FOR CONFERENCE:

Arpan Gupta - Additional Director &

Head, Mines, Metals, Cement Power,

Coal & Renewable Energy, FICCI

M: +91-8802933361

E: arpan.gupta@ficci.com

Namrata Sagar -

Assistant Director, FICCI

M: +91-8802933361

E: namrata.sagar@ficci.com





CELEBRATING THE TRAILBLAZERS

Shaping the Future of Infrastructure

The 11th edition of the EPC World Awards brought together over 30 trailblazing leaders and innovators, honoring their exceptional contributions to the infrastructure, engineering, and construction sectors. Organized by EPC World Media Group, the event celebrated visionaries who are not only driving industry growth but also shaping its future, setting new standards of excellence and transformation across the sector.



The 11th edition of the EPC World Awards, held on February 21, 2025, at Hotel The Ashok in New Delhi, set the stage for an extraordinary celebration of excellence in the infrastructure, engineering, and construction industries. Hosted by the EPC World Media Group, the event marked a significant milestone in recognizing the champions who are shaping the future of these vital sectors. With over 30 exceptional winners across various categories, this prestigious ceremony stood as a testament to the remarkable achievements that continue to drive progress in the industry.

The evening was inaugurated by *Tejasvi Sharma, Editor-in-Chief and Managing Director of EPC World Media Group*, who was joined by other distinguished dignitaries in celebrating the pioneers who have redefined

infrastructure and construction through innovation, vision, and strategic foresight. “The EPC World Awards plays a vital role in promoting excellence and growth in one of the most crucial sectors of our economy,” Tejasvi Sharma remarked during the event. “I extend my heartfelt appreciation to the stalwarts of the construction and infrastructure industry for their invaluable contribution to the nation’s economic progress.”

Honoring Industry Leaders and Innovators

The 11th edition of the EPC World Awards honored individuals and organizations that have left an indelible mark on the industry through their exceptional leadership and dedication. The event recognized key figures across four major categories: Infrastructure, EPC, Special Achievement, and Construction.

Among the most notable awardees was **Larsen & Toubro**, who were honored with the prestigious title of 'Infra Company of the Decade,' a recognition for their outstanding contributions to the infrastructure landscape over the past decade. **Tata Projects** took home the coveted 'EPC Company of the Year' award for their excellence in delivering complex engineering, procurement, and construction projects. The evening also saw **Rajesh Kumar Singh, Chairman & Managing Director of Bridge And Roof Company (India)**, receiving the 'Visionary of the Decade: Driving Turnaround Success' award for his exceptional leadership in turning around his company's fortunes.

In another highlight, **Vinayak Pai, Managing Director & CEO of Tata Projects**, was named 'Infra Person of the Year,' reflecting his outstanding contributions to the growth and development of the infrastructure sector. Meanwhile, **Manish Kumar, Executive Vice President & CTO of ITD Cementation India**, was honored with the 'Lifetime Achievement' award for his enduring legacy in the construction and infrastructure space.

The 'Women Contribution in Infrastructure' award went to **Sudesna Biswas, Head Hydrology & Senior Chief Engineering Manager at Larsen and Toubro**, acknowledging her pivotal role in driving innovation and leadership in a traditionally male-dominated field. The award for 'Infra Consultant of the Year' was presented to **Realization Technologies**, a firm that has consistently raised the bar in infrastructure consulting.

A Glimpse of Other Key Achievements

In addition to the marquee awards, the ceremony also recognized several outstanding contributions across specialized areas of the infrastructure and construction sectors. **Airports Authority of India** was honored for their 'Outstanding Achievement in Airport Operations,' while **Larsen & Toubro** received accolades for their 'Outstanding Contribution to Innovative Urban Transportation.' Other notable winners included **Welspun Michigan Engineers**, named the 'Outstanding Company in Specialized Construction,' and **Tata BlueScope Steel**, honored for their 'Outstanding Contribution to Roofing Solutions.'

Pidilite Industries, a leader in construction chemicals and waterproofing solutions, also earned recognition for their exemplary contributions to the industry. **Nemetschek India** was awarded the 'Emerging Global Engineering Design Technology Company' award, while **Ashoka Buildcon** took home the honor for 'Outstanding Contribution in Roads & Highways.'

A Day of Knowledge Sharing

In addition to the prestigious awards ceremony, the event featured a dynamic, day-long interactive forum that focused on pressing urban transportation projects. This forum included a series of insightful panel discussions covering key topics such as Roads & Bridges, Metro Rail, RRTS (Regional Rapid Transit System), and Airport Projects. The discussions attracted a diverse group of delegates from various sectors, including engineering, architecture, manufacturing, construction, and infrastructure, fostering a rich exchange of knowledge and perspectives.

The forum provided an exceptional platform for industry experts, thought leaders, and stakeholders to come together, collaborate, and engage in meaningful conversations about the challenges and opportunities shaping the future of urban transportation. With an emphasis on innovation and sustainable development, the event facilitated deeper insights into the latest trends, technological advancements, and best practices that will drive the evolution of urban mobility and infrastructure in the years to come. This collaborative environment not only enhanced understanding of the current landscape but also paved the way for future partnerships and solutions in the ever-growing urban transportation sector.

Looking Ahead

Reflecting on the success of the event, **Tejasvi Sharma** shared his satisfaction, saying, "We are incredibly pleased to host yet another successful edition of the EPC World Awards. It's our privilege to recognize the industry's best, who have played a pivotal role in advancing the engineering, construction, and infrastructure sectors. Since inception, EPC World Media Group has been committed to staying in tune with the evolving dynamics of the industry, delivering the latest updates and insights. This marks the 11th edition of our awards, and we remain steadfast in our mission to honor and highlight the exceptional work of the trailblazers transforming the sector."

The EPC World Awards continues to stand as a beacon of recognition in the infrastructure and construction industries, celebrating excellence, fostering collaboration, and inspiring future innovations. As the sector continues to evolve, the 11th edition of the awards has set a high benchmark, highlighting the exceptional work and visionaries who are shaping the future of engineering, infrastructure, and construction.

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VOICES OF EXCELLENCE

Inspiring leadership and visionaries share insights at the 11th EPC World Awards

The award recipients delivered inspiring speeches that emphasized their dedication, teamwork, and transformative impact on the construction and infrastructure sectors. They shared their journeys, challenges, and commitment to advancing the nation's infrastructure, celebrating both individual achievements and the collaborative spirit driving the industry toward a more sustainable future.



Speaking during his acceptance speech while receiving the award for Visionary of the Decade: Driving Turnaround Success, **Rajesh Kumar Singh, Chairman & Managing Director of Bridge and Roof Company (India)**, shared, "I may not be a great orator, but I take pride in being a dedicated administrator and engineer. The project for which I am receiving this award is the Crude Oil Import Terminal project in Paradeep for M/s. Indian Oil Adani Ventures Limited, which we completed ahead of schedule. Our success came through hard work, meticulous planning, and effective execution. We completed this ₹1,120 crore EPC project in just 16 months, well before the deadline, which is why this award is so meaningful to me."

My advice to all engineers, drawn from my 32 years of experience, is that with honesty, sincerity, and a clear vision, anything is achievable. No matter the challenges, we must always strive to accomplish our goals. At Bridge and Roof, we have proven this with our work. When I joined as Chairman, the company's turnover was ₹2,200 crore. Today, in just three years, we are poised to reach ₹5,000 crore. We've made significant profits and are set to become a Schedule A company. We are expecting a major order in the first week of March, and our ultimate target is to make the company a Navratna by 2026."

This inspiring message encapsulates his leadership vision and dedication, which has not only propelled the company forward but has set new standards in the industry.



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Receiving the award for Infra Person of the Year, **Vinayak Pai, Managing Director & CEO of Tata Projects**, expressed, “Thank you to EPC World for this honor. I am truly grateful for the recognition of our contributions. However, i believe this award is for the entire industry—we are merely the representatives. As Ashok Wankhede mentioned, there are numerous challenges ahead, but we have also faced many behind us. We’ve successfully navigated these obstacles over the years, and we will continue to do so. This reflects the resilience of the industry we serve.

While many talk about the vast opportunities in the industry, with investments in the lakhs of crores, we also have a great responsibility to fulfill them. Often, the focus is on time and cost, but we must equally emphasize safety, quality, and sustainability. These are essential elements for making projects more predictable.

Data shows that ninety percent of projects don’t succeed, and we must work together to improve this track record in India. Just as we’ve broken other records, i am confident that, as an industry, we will unite to find ways to overcome these challenges and achieve success.”

While receiving the Lifetime Achievement Award, **Manish Kumar, Executive Vice President & CTO of ITD Cementation India**, expressed, “It is truly humbling to be recognized for something i am so passionate about. I extend my sincere gratitude to EPC World Media and the jury for selecting me for this prestigious award. This recognition is not just mine, but belongs to the incredible colleagues, mentors, and teams I’ve had the privilege of working with throughout my career as a geotechnical engineer and in executing EPC projects.

From the start, i was drawn to the challenge of building strong, economical foundations on grounds once considered unbuildable. Every project has been a learning experience, offering opportunities to innovate and integrate locally available resources with environment-friendly solutions. This approach has not only accelerated progress, saving time and reducing costs, but also improved quality and safety.

Over my 40-year career, I’ve faced numerous challenges and failures. While we often celebrate our successes, it’s in overcoming setbacks that we grow the most. These experiences allowed me to learn, adapt, and find solutions that brought success, which is something I cherish deeply.

To the next generation of engineers, I urge you to embrace the study of failures and challenges. This will make you more accomplished and resilient. Keep pushing boundaries, stay curious, and understand the impact of your work. While this award is a significant milestone, the journey continues, and I look forward to contributing even more.



Lastly, I would like to thank my family, especially my wife Charu and children Kshitij and Yasna, for their unwavering support, as well as my peers and ITD Cementation for providing me the freedom to pursue my passion. I am truly honored to receive this Lifetime Achievement Award.”



While receiving the Infrastructure Excellence Leadership of the Year award, **Roy Kurien, Vice President & Head - Operational Services (Heavy Civil Infrastructure IC), Larsen & Toubro**, expressed his gratitude, saying, ‘Thanks to the esteemed guests, industry leaders, respected jury members, and EPC World media. I am greatly honored to receive this award.’

First, I would like to thank our CMD, Mr. S. N. Subrahmanyan, and our Director, Mr. S. V. Desai, for their unwavering confidence in our capabilities, which has driven us to this success. This award is not mine; it belongs to the entire construction industry—the engineers, the planners, and the workforce on the ground who truly have the vision and bring it to reality.

At this point, I would like all of you to join me in building the nation with excellence, purpose, and passion, so that we can elevate India to greater heights. Thank you all once again, and thanks to EPC World for this recognition.”

K. Senthilnathan, Executive Vice President & Head - Technical Services (Heavy Civil Infrastructure IC) at Larsen & Toubro, expressed his gratitude while receiving the award for Transformational Infra Designer of the Decade, saying, “It is both a privilege and an honor to receive this recognition as the Design Engineer of the Decade. I also heard from my predecessors about the significant work Larsen & Toubro has been doing, and i can assure you that we will continue to evolve technologies that are adaptable to construction in India—and not just in India, but also overseas, where we have implemented numerous innovations.

Innovation will remain at the core of our work. Quality is paramount in our agenda, and, of course, safety is always our top priority. We take both safety and quality with equal seriousness, and i assure you that at Larsen & Toubro, we will continue to focus on these aspects diligently, striving to do our best for both the industry and the nation as a whole.

Thank you once again to the jury for selecting me for this prestigious award, and i truly appreciate this recognition.”



On receiving the EPC Person of the Year award, **Mohan Ramesh, TFL Head - High Speed Rail Division at Larsen & Toubro**, expressed his gratitude, saying, “Thank you very much for the EPC World Awards as EPC Person of the Year. This recognition is not only motivating individuals like me, but it also inspires the next generation to strive for excellence in the fields of engineering, procurement, and construction. I extend my special thanks to the jury members for selecting me for this honor and sponsors/partners for organizing this event.

Over the past three decades, I have dedicated myself to executing numerous infrastructure projects. Currently, I am working on one of the most challenging projects of my career—the high-speed rail connecting Vadodara and Ahmedabad. What initially I thought seemed like a gigantic task but has been progressing at high speed. Thanks to the innovative construction methods and equipment designed by our in-house team. I am truly grateful to EPC World Media for this award, and I would like to extend a special thanks to my company for giving me the opportunity to receive this recognition.”

EPC CATEGORY



Outstanding Contribution in Oil & Gas

**Bridge And Roof Company
(India) Limited**

Rajesh Kumar Singh
Chairman & Managing Director

Outstanding Company in Specialized Construction

Welspun Michigan Engineers Ltd.

Rajeev Kumar
Senior Vice President
Welspun Enterprises



Outstanding Contribution to Innovative Urban Transportation

Larsen & Toubro Limited

Amit Kumar Singh
Sr. Construction Manager
Pratik Sinha
Sr. Manager &
Sourabh Tuljapurkar
Planning Manager



Outstanding Contribution in Roads & Highways (Large Project)

MKC Infrastructure Limited

Jawahar Lal Kaul
Executive Director



Outstanding Contribution to Power Plant Industrial Structures

BEKEM Infra Projects Pvt. Ltd.

Dr. Kishore Nuthalapati
Chief Financial Officer &
Rahul Dalal
CEO and Director of Lodestar Strategic



Outstanding Contribution in Roads & Highways (Very Large Project)

Ashoka Buildcon Limited

Rahul Korhale
Project Manager &
Ajinkya Ghorpade
Project Co-ordinator





Outstanding Contribution to Power EPC

BTL EPC Limited

Tanmoy Pramanick
Sr. Vice President-Proejct &
Pallabh Chakraborty
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Outstanding Company in Renewable Energy EPC

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Sitaram Singhal
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INFRA CATEGORY

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KEC International Limited

Rajinder Gupta

Chief Executive - T&D India & Sri Lanka



Outstanding Contribution to
Oil & Gas

**Toyo Engineering India
Private Limited**

Charat Hora

Head (operations)



Outstanding Contribution in

**Roads & Highways
(Very Large Project)**

Patel Infrastructure Limited

Pankaj Sachan

Vice President- Corporate Affairs &

P.V. Krishna Mohan

Dy. General Manager





Outstanding Contribution in

Urban Transport (Metro Rail project)

Larsen & Toubro Limited
(Railway SBG)

Sunil Khattar

Head- Metro Business Unit

Ravi Sehrawat

Head - Execution (RRTS project) &

Srikar V

Sr. Manager QA/QC

Outstanding Contribution to

Urban Infrastructure (Solid Waste Management)

Ramky Infrastructure Limited

Subhir Kare

Sr. Vice President &
Head of Business Development



Outstanding Contribution in

Railway Infrastructure

Rahee Infratech Limited

Krishna Kumar

General Manager - Project & Planning

Outstanding Contribution in

Industrial & Warehousing Project

Minda Infrastructure LLP

Yogesh Bhugra

COO and Business Head &

Vijayshankar Gupta

CMO and Head of Business Development



Infra Consultant of the Year

Realization Technologies India Pvt. Ltd.

Dr. Sourav Basu

Managing Director

Mohd Aadil Siddiqui

Product Director

Outstanding Company in

Diaphragm Wall Construction & Piling

GKV Infrastructure Pvt. Ltd.

Vijay Vanzara

Managing Director & Team





Visionary of the Decade: Driving Turnaround Success

Rajesh Kumar Singh

Chairman & Managing Director
Bridge And Roof Company (India) Ltd.

Infra Person of the Year

Vinayak Pai

Managing Director & CEO
Tata Projects Ltd.



EPC Person of the Year

Mohan Ramesh

Vice President and TFL Head - High Speed Rail
Project C6
Larsen & Toubro Ltd.

Lifetime Achievement Recognition

Manish Kumar
Executive Vice President & CTO
ITD Cementation India Ltd.



Infrastructure Excellence Leadership of the Year

Roy Kurien
Vice President & Head - Operational Services
(Heavy Civil Infrastructure IC)
Larsen & Toubro Ltd.



Transformational Infra Designer of the Decade

K Senthilnathan
Executive Vice President & Head -Technical
Services (Heavy Civil Infrastructure IC)
Larsen & Toubro Ltd.





EPC Company of the Year

Tata Projects Ltd.

Vinayak Pai

Managing Director & CEO

Sourabh Mukherjee

EVP & Head of Clean Energy & Sustainability

Subrata Chatterjee

EVP & SBU Head (T&D) and

Sanjiv Kumar Singh

VP – Projects (T&D)

Infra Company of the Decade

Larsen & Toubro Ltd.
(Heavy Civil Infrastructure IC)

Roy Kurien

VP & Head - Operational Services

K Senthilnathan

EVP & Head -Technical Services

A R Soni

EVP-Corporate Affairs &

Prasad Selvam S R

Senior Manager -Technical Services



Emerging Global EPC Company of the Year

ITD Cementation India Ltd.

Manish Kumar

Executive Vice President & CTO &

Himadri Sen

Sr. General Manager



CONSTRUCTION CATEGORY

Emerging Global Engineering Design Technology Company

Nemetschek India Private Ltd.

Nirmalya Chatterjee

Country - VP and MD (Indian Subcontinent)

Sankar Pitta

GM- Marketing and Business Development &

Manideep Saha

GM and Head of Channel Business



Sustainable Commercial Vehicle of the Year

Blue Energy Commercial Vehicles Pvt. Ltd.

Jayesh Shelar

Chief Marketing Officer



Outstanding Company in Heavy Commercial EV Trucks for 470 HEV electric dump truck

Propel Industries Pvt. Ltd.

Siddharth Kirtane

President - EV Sales

Marketing & Customer Service &

Mohan Duraiswami

DGM- Marketing





Outstanding Contribution to Roofing Solutions for the Pune Metro Project

Tata BlueScope Steel Pvt. Ltd.

C R Kulkarni

VP - Marketing & Strategic Sourcing,

Rahul Saxena

GM- Sales (Coils, BP Infra and Retail) &

Ranadeep Banerjee

AGM- Sales (Lysaght Western Region & Sectoral)

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An insightful presentation by Nirmalya Chatterjee of Nemetschek India



Sanjeev Gupta of Realization Technologies, shares his insights



Transforming Transportation: A presentation by Prateek Sinha of L&T



Manav Gulati of Tata BlueScope Steel presenting architectural steel solutions for urban transportation projects



Aashish Kapur from Egis India expressing the vote of thanks at IIF 2025



Rajat Gosain of NCRTC delivered an engaging and insightful presentation on Namo Bharat System (RTS)

The Future of Urban Mobility: Metro Rail in India

India's urban landscape is transforming with the rapid expansion of metro rail systems across the country. What began with the Kolkata Metro in 1984 has grown into an extensive network spanning over 20 cities, revolutionizing urban transportation. Recent announcements of new metro rail projects, coupled with technological advancements and burgeoning business opportunities, signal a promising future for India's metro rail sector.



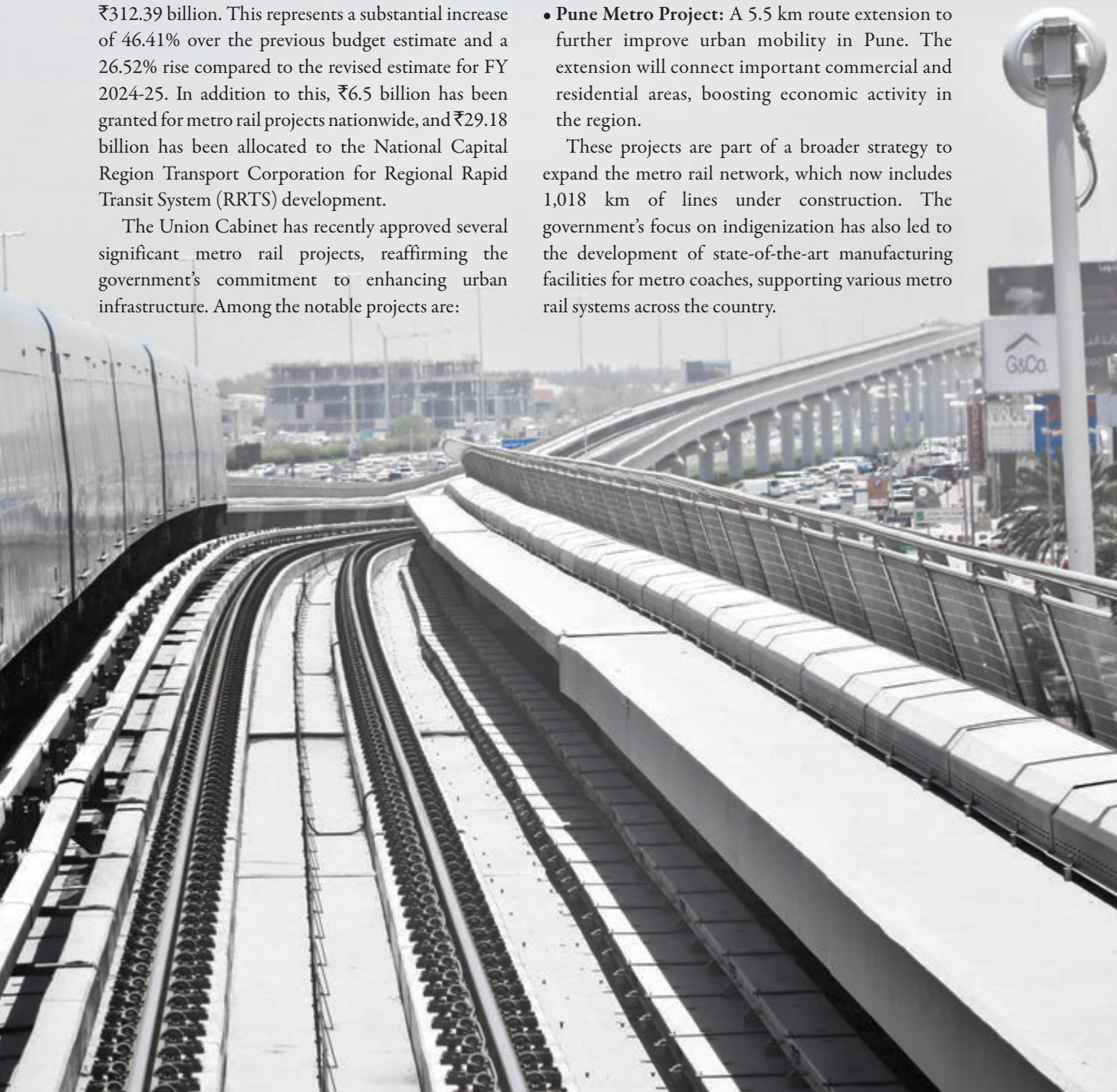
With a network exceeding 1,000 km and serving 23 cities in 11 states, India's metro systems have become a vital artery for millions of commuters. This extensive infrastructure has solidified India's position as the third-largest metro network globally, fundamentally altering urban transit.

The Indian government has significantly boosted funding for metro rail and mass rapid transit systems (MRTS) in the FY 2025-26 Union Budget, allocating ₹312.39 billion. This represents a substantial increase of 46.41% over the previous budget estimate and a 26.52% rise compared to the revised estimate for FY 2024-25. In addition to this, ₹6.5 billion has been granted for metro rail projects nationwide, and ₹29.18 billion has been allocated to the National Capital Region Transport Corporation for Regional Rapid Transit System (RRTS) development.

The Union Cabinet has recently approved several significant metro rail projects, reaffirming the government's commitment to enhancing urban infrastructure. Among the notable projects are:

- **Bengaluru Metro Project:** A 44 km expansion comprising two corridors, aimed at improving connectivity and reducing traffic congestion in the city. The project includes the construction of elevated and underground sections, with stations equipped with modern amenities.
- **Thane Metro Project:** A 29 km network designed to alleviate road congestion and enhance urban mobility in Thane. The project features a combination of elevated and underground lines, providing seamless connectivity to key areas.
- **Pune Metro Project:** A 5.5 km route extension to further improve urban mobility in Pune. The extension will connect important commercial and residential areas, boosting economic activity in the region.

These projects are part of a broader strategy to expand the metro rail network, which now includes 1,018 km of lines under construction. The government's focus on indigenization has also led to the development of state-of-the-art manufacturing facilities for metro coaches, supporting various metro rail systems across the country.



Technological Advancements in Metro Rail

India's metro systems are undergoing a technological leap, incorporating advanced solutions to revolutionize urban mobility. Notable advancements include the pioneering underwater metro tunnel in Kolkata, the introduction of driverless metro trains in Delhi, and the innovative water metro in Kochi. These technological strides are complemented by substantial expansion plans in Bengaluru, Thane, and Pune, highlighting India's commitment to creating a future-ready transportation infrastructure.

Some of the key technological advancements include:

- **Namo Bharat Train:** Operating on the Delhi-Meerut RRTS corridor, this state-of-the-art train boasts a design speed of 180 km/h and an operational speed of 160 km/h. The train features modern interiors, comfortable seating, and advanced safety systems, providing a world-class travel experience for passengers.
- **European Train Control System (ETCS):** The world's first hybrid Level-II/III radio-based signaling system on an LTE backbone, enhancing passenger safety. This system enables real-time monitoring and control of train movements, reducing the risk of accidents and ensuring efficient operations.
- **Platform Screen Doors (PSD):** Developed jointly by Bharat Electronics Limited (BEL) and the National Capital Region Transport Corporation (NCRTC), these doors improve passenger safety and reduce accident risks. PSDs are installed at metro stations to prevent accidental falls onto the tracks and enhance overall station safety.
- **National Common Mobility Card (NCMC):** Supporting the One Nation-One Card initiative, the NCMC enables seamless travel across all enabled public transport systems in India. The card can be used for metro, bus, and suburban rail services, simplifying fare payments and promoting cashless transactions.
- **QR-Based Ticketing:** The introduction of mobile-based QR ticketing makes travel more efficient and contactless for metro commuters. Passengers can purchase tickets through mobile apps and use QR codes for entry and exit, reducing the need for physical tickets.
- **Unmanned Train Operations (UTO):** To enhance efficiency and service quality, UTO has

been successfully deployed on several stretches of the Delhi Metro. UTO systems allow trains to operate without drivers, relying on advanced automation technologies to ensure safe and reliable operations.

- **Indigenous Automatic Train Supervision (i-ATS):** India's first home-grown Automatic Train Supervision System, jointly developed by DMRC and BEL, has been implemented on Delhi Metro's Red Line. The i-ATS system enables real-time monitoring and management of train operations, improving service reliability and efficiency.

These advancements not only improve the speed and efficiency of metro travel but also ensure that safety and sustainability remain top priorities.

Business Opportunities in the Metro Rail Sector

The expansion and modernization of India's metro rail network present a plethora of business opportunities across various sectors. Key areas where businesses can capitalize on this growth include:

- **Infrastructure Development:** The ambitious station redevelopment program offers vast opportunities for construction companies, real estate developers, and retailers. This initiative aims to transform key railway stations into commercial hubs, creating demand for construction and engineering services. The redevelopment projects include the construction of modern passenger amenities, commercial spaces, and multi-modal transport facilities.



India's metro rail expansion has been marked by several key moments that have shaped the urban transportation landscape. Here are some of the significant milestones:

- 1969: The idea for a metro system in India was first proposed through the Metropolitan Transport Project, aimed at addressing the country's urban transport challenges.
- 1984: The first metro line, covering 3.4 km between Esplanade and Bhowanipur, opened in Kolkata. This marked the birth of metro life in India.
- 1995: The Delhi Metro Rail Corporation (DMRC) was formed, marking a turning point in urban transportation. This initiative laid the foundation for one of the world's largest metro systems.
- 2002: The first metro corridor between Shahdara and Tis Hazari in Delhi was inaugurated, initiating the expansion of the Delhi Metro.
- 2011: Namma Metro (Bengaluru Metro) opened its first segment, bringing metro rail services to the city of Bengaluru.
- 2017: Chennai Metro introduced its first underground section, marking a major achievement for southern

India's metro expansion.

- 2020: Kochi Metro completed Phase 1, making Kerala the latest state to join the expanding metro network.
- 2022: India surpassed Japan in metro rail development, becoming a global leader in metro rail networks.
- 2025: Prime Minister Narendra Modi laid the foundation for multiple metro development projects worth over ₹12,200 crore, including the inauguration of a 13 km stretch of the Delhi-Ghaziabad-Meerut Namo Bharat Corridor and a 2.8 km stretch of the Delhi Metro Phase-IV.

(Source – PIB)



"OVER THE LAST DECADE, EXTENSIVE WORK HAS BEEN DONE IN BOOSTING METRO CONNECTIVITY, THUS STRENGTHENING URBAN TRANSPORT AND ENHANCING EASE OF LIVING."

~ Prime Minister
Shri Narendra Modi

- **Rolling Stock Manufacturing:** The increasing need for new locomotives, passenger coaches, and freight wagons presents significant growth potential for businesses involved in the manufacturing and maintenance of rolling stock. Indian Railways' focus on indigenization and the Make in India initiative further boost opportunities for domestic manufacturers.
- **Digital Transformation:** Indian Railways is embracing digital technologies to streamline

operations and offer better services to passengers. IT companies have abundant opportunities to contribute to the digital landscape in areas such as ticketing solutions, passenger information systems, real-time train tracking, and mobile apps. The implementation of digital solutions enhances operational efficiency, passenger convenience, and overall service quality.

- **Sustainable Practices:** The adoption of solar power panels and regenerative braking systems in metro operations promotes environmental sustainability and reduces operational costs. Companies specializing in renewable energy and energy-efficient technologies can tap into this growing market. The focus on sustainability also extends to the use of green building practices in station construction and the implementation of energy-efficient lighting and HVAC systems.

Looking ahead

India's metro rail sector is poised for significant growth, driven by recent project announcements, technological advancements, and emerging business opportunities. As the country continues to invest in urban infrastructure, the metro rail network will play a crucial role in shaping the future of urban mobility, making cities more connected, efficient, and sustainable.

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We are deeply committed to the infrastructure industry



By using real-time data, projects are completed on time and within budget, while also providing valuable insights for ongoing maintenance and operational improvements, says

AMY HEFFNER,
Director, Industry
Marketing –
Transportation,
Bentley Systems

What is the role digital twin technology is playing in transforming India's transportation infrastructure?

Digital twin technology is changing India's transportation infrastructure by helping organizations create dynamic, data-driven replicas of their assets. As an open and scalable platform, digital twins bring together data from different sources, allowing infrastructure professionals to make better decisions throughout the entire lifecycle - from design and construction to operation and maintenance. This approach encourages collaboration, breaks down data barriers, and leads to more efficient project delivery and better infrastructure performance.

For example, metro projects in Nagpur and Pune have used 5D Building Information Modeling (BIM), which combines 3D models with time and cost data to improve decision-making during design, construction, and handover. By using real-time data, projects are completed on time and within budget, while also providing valuable insights for ongoing maintenance and operational improvements. Without a digital twin, if issues arise in a project years after construction, details may be missing or hard to locate on paper. But with

real-time, 3D records, problems can be found quickly, and solutions can be implemented more efficiently.

In India's expanding aviation sector, digital twins are key in the construction, operation, and maintenance of new airports. These digital models improve collaboration and data sharing, making projects more efficient. By using AI and digital twin technology, airport professionals can improve runway inspections, making data collection and analysis easier. This increases safety and helps prioritize maintenance tasks with automated insights and AI-powered analysis. Across roadways, metros, bridges, and airports, digital twins make sure that project data stays accurate and updated, leading to better asset performance, smoother maintenance, and longer-lasting assets.

What are the key challenges in optimizing large-scale transportation projects such as rail systems and urban transit networks?

How is your software aiding in overcoming these challenges?

Optimizing large-scale transportation projects, such as rail systems and urban transit networks, involves addressing several complex challenges:



Understanding existing asset conditions

Owner-operators face the challenge of safely and thoroughly inspecting and monitoring both above- and below-ground conditions, as well as analyzing data for actionable insights. This step is essential for making informed decisions that improve project efficiency, accessibility, safety, and resiliency while staying within budget and timelines. Bentley's Asset Analytics offers solutions for all infrastructure industries to help understand physical asset conditions and their context, from asset capture and modeling to asset detection and analytics, asset monitoring, and network simulation and analytics. In addition to understanding conditions and context, a common obstacle that is often overlooked is ground risk. Subsurface issues can significantly impact costs, claims, and delays. Leveraging Bentley and its subsurface company, Seequent, for earth-modeling, analysis, data management, and collaboration software can unlock a common understanding of ground conditions to enable Geo professionals the ability to collaborate seamlessly with transportation professionals across the infrastructure lifecycle. This approach delivers projects faster, with greater certainty, and achieves better, more sustainable outcomes.

Collaboration among multiple stakeholders

Transportation projects involve diverse stakeholders, including government agencies, contractors, engineers, and local communities.

Miscommunication, incompatible systems, and lack of real-time data can lead to errors, delays, and cost overruns. Effective data governance ensures that the large volumes of data generated - ranging from design plans to ongoing performance data - are accurate, accessible, and secure, supporting collaboration and minimizing disruptions. Bentley's open data platforms and project delivery solutions facilitate seamless collaboration among diverse stakeholders, ensuring data is accurate, secure, and easily accessible, which helps reduce miscommunication and delays. Recognizing that stakeholders are at different points in their digital transformation journeys, Bentley offers solutions to bridge the transition from 2D to 3D, simplifying adoption and enhancing project outcomes.

Time and interruptions to the public

Infrastructure upgrades or construction often disrupt daily commuting or transportation services, causing inconvenience to the public. Efficient project planning and communication are key to reducing these impacts and maintaining public satisfaction. Bentley helps minimize disruptions to communities during transportation construction by providing advanced digital tools that enable better planning, design, and management. Through solutions like OpenRoads and OpenRail, transportation professionals can create detailed simulations and 3D models, identifying potential issues like traffic disruptions and environmental impacts early in the process. Bentley's digital



project management tools, such as SYNCHRO, optimize project scheduling and sequencing to reduce delays and limit the duration of disruptions like road closures. Real-time monitoring through digital twin technology allows teams to quickly address any emerging issues and adapt plans as needed, ensuring minimal impact on local traffic and daily life. Additionally, Bentley's solutions foster collaboration between contractors, government agencies, and local stakeholders, facilitating transparent communication and proactive problem-solving.

As a leading infrastructure engineering software company, how do you support government agencies, EPC contractors, and infrastructure developers in driving digital transformation in transportation infrastructure?

As a leading infrastructure engineering software company, Bentley is not only invested in software and technology but also deeply committed to the infrastructure industry. We immerse ourselves in industry associations and government policy to stay aligned with the trends, standards, and requirements of agencies and their ecosystems. This ensures that our software and support continuously evolve to meet the needs of government agencies, EPC contractors, and infrastructure developers, helping drive digital transformation in transportation infrastructure. Bentley's commitment to openness also helps drive digital transformation. By prioritizing open standards, open-source technologies, and open APIs, we enable users to easily access, utilize, and share data across platforms, fostering collaboration and innovation within the infrastructure sector. Open-source technology encourages widespread

adoption, ensuring data can seamlessly flow across projects and lifecycle phases without being locked into proprietary systems. This is particularly important for long-lived infrastructure assets, where avoiding vendor dependency is critical. Bentley's digital twin technology helps owner/operators retain control over their data, enhancing their ability to manage assets over time. Openness is essential in infrastructure projects due to their scale and complexity. These projects involve multiple organizations and disciplines, making it impractical to rely on a single vendor. By supporting open technology, we ensure data interoperability and adaptability across evolving software ecosystems. Additionally, Bentley has advanced open platforms like Cesium, the leading open-source 3D geospatial platform, which is used globally to create geospatial applications and further drives innovation in the industry.

In what ways can digital twins help in reducing project delays and cost overruns?

Digital twins can reduce project delays and cost overruns by providing real-time, accurate data to improve decision-making and streamline processes throughout a project's lifecycle. Here's how:

Improved planning and design: Digital twins create a detailed, data-driven model of the project, allowing for better planning and early identification of potential issues, which helps avoid costly redesigns and delays.

Real-time monitoring: By integrating real-time data, digital twins offer continuous insights into the project's progress and performance. This allows teams to address issues proactively, preventing delays and cost escalations.

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INDIA'S FLAGSHIP ENERGY BUSINESS PLATFORMS



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Collaboration and communication: Digital twins ensure all stakeholders have access to the same up-to-date information, reducing miscommunication and ensuring alignment, thus preventing errors and rework.

Predictive maintenance: With predictive analytics, digital twins help anticipate maintenance needs, reducing unexpected downtime and the costs associated with unscheduled repairs.

Optimized resource management: Digital twins allow for better resource allocation by tracking progress and identifying areas for efficiency, reducing waste, and preventing cost overruns.

What role does advanced analytics, AI-driven insights and IoT play in enhancing predictive maintenance and operational efficiency in the transportation sector?

Advanced analytics, AI-driven insights, and IoT play a critical role in enhancing predictive maintenance and operational efficiency in the transportation sector by enabling real-time data collection, analysis, and proactive decision-making. Here's how each contributes:

IoT: IoT devices, such as sensors embedded in infrastructure and vehicles, continuously collect real-time data on asset conditions, performance, and usage. This data provides a comprehensive view of the system's health, allowing operators to monitor conditions like temperature, vibration, and wear in real-time.

Advanced analytics: By analyzing vast amounts of data from IoT devices, advanced analytics identifies patterns, trends, and anomalies. This allows transportation managers to detect early signs of potential failures, prioritize maintenance tasks, and prevent costly breakdowns. It also helps optimize scheduling and resource allocation, improving overall operational efficiency.

AI-driven insights: AI algorithms can analyze historical data alongside real-time inputs to predict when assets will need maintenance or replacement. By leveraging machine learning models, AI can continuously improve predictions, making maintenance more proactive rather than reactive. This leads to fewer unplanned downtimes, reduced maintenance costs, and extended asset life.

Together, IoT, AI, and advanced analytics help transportation organizations move from a reactive to a proactive maintenance approach, ensuring assets are optimized for performance, reducing disruptions, and improving overall efficiency.

What are the future trends in transportation digitalization? How is Bentley Systems aligning its software solutions and innovations to support this transformation?

AI is the defining technology of our time: The sheer scale and volume of data created from design to maintenance makes infrastructure a prime area where AI can have a great impact. Bentley has been investing in AI for several years and most recently introduced OpenSite+, the first engineering application leveraging generative AI for civil site design to deliver optimized, accurate site designs up to 10 times faster than traditional methods. OpenSite+ leverages an AI assistant, or "copilot," and provides site layout optimizations and automated drawing production to drive new levels of productivity and accuracy. This new offering is the first of a new generation of Bentley Open Applications which run on desktops for optimal responsiveness, while offering the benefits of cloud-based applications, such as automatic updates and cross-operating system availability. The iTwin-native architecture enables seamless collaboration and data-centric workflows. Data is saved directly in a digital twin, which in turn can include data from other sources to provide full context for all design work.

How is Bentley Systems helping address the critical challenge of climate change and sustainability?

Bentley Systems is addressing the critical challenge of climate change and sustainability by leveraging technology to enhance infrastructure resilience and reduce environmental impact. By automating repetitive tasks, Bentley's solutions allow engineers to focus on designing infrastructure that can better withstand severe weather events and extreme climates. For existing infrastructure affected by natural disasters, engineers can respond more swiftly to assess damage and develop solutions to rebuild stronger and more resilient structures. Going digital minimizes errors and rework, reducing material waste and field time, which helps lower the overall carbon footprint. Additionally, Bentley's advancements in monitoring, detection, and AI-driven pattern recognition enable proactive maintenance, allowing engineers to stay ahead of aging infrastructure and prevent potential disasters. This approach extends the lifespan of assets and ultimately contributes to a higher quality of life for communities by ensuring safer, more sustainable infrastructure.

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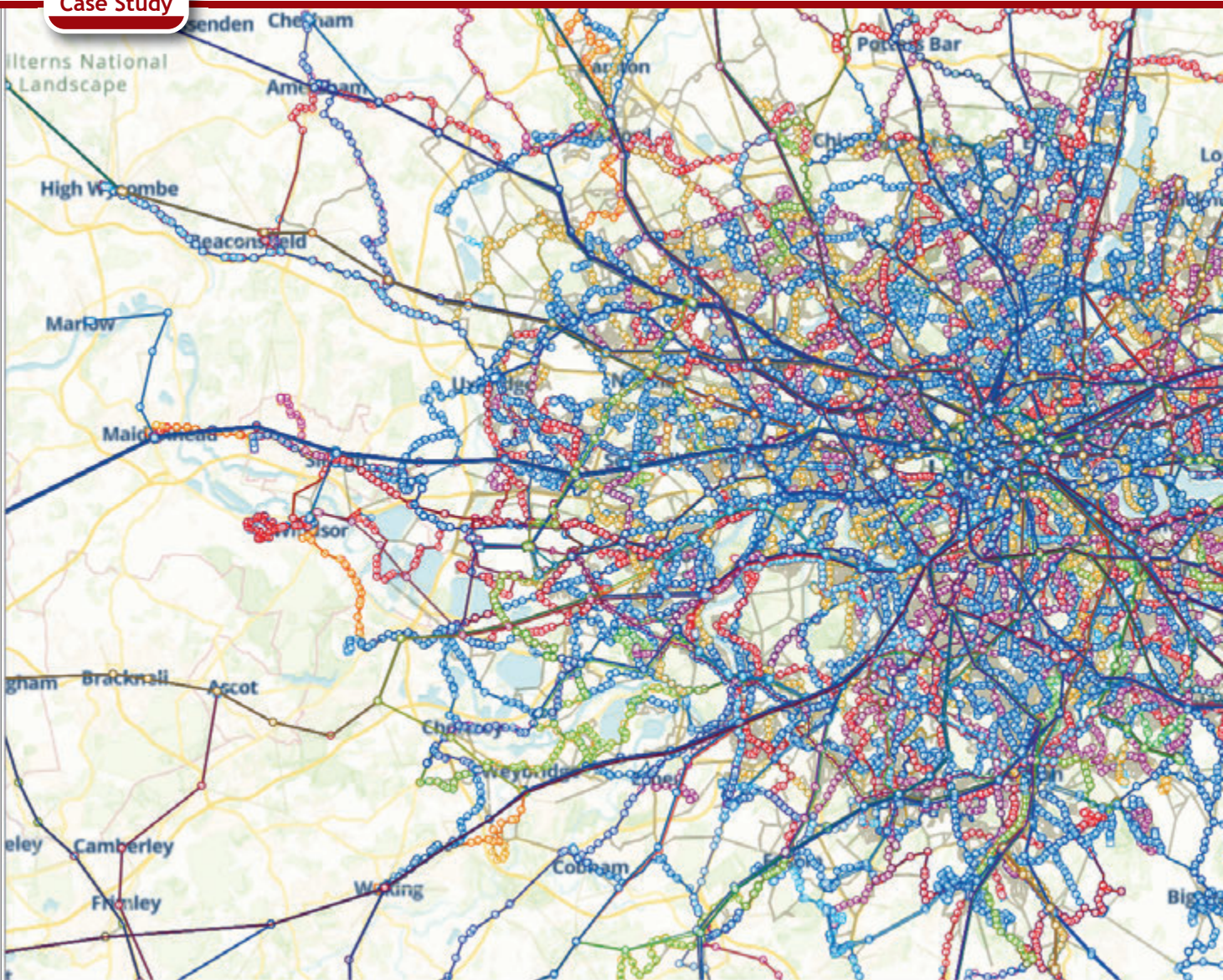
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The Railplan public transport model in OpenPaths EMME.

Transport for London delivers the Elizabeth Line, London's largest addition to public transport in over 50 years

OpenPaths EMME helped improve commuter experience, bringing an additional 1.5 million people within 45 minutes of Central London

Public transport to support the economic growth of London

The Elizabeth Line is the largest single addition to London's public transport network since the Victoria Line in 1968. Intended to support economic growth by tackling congestion on the existing rail network and improving rail access into and within London, the Elizabeth Line connects Greater London with the main financial and leisure districts, including the UK's largest airport Heathrow. The service is named after Queen Elizabeth II, who officially opened the line in May 2022 in honor of her platinum jubilee. Fully opened in May 2023, the line operates up to 24 trains per hour with capacity

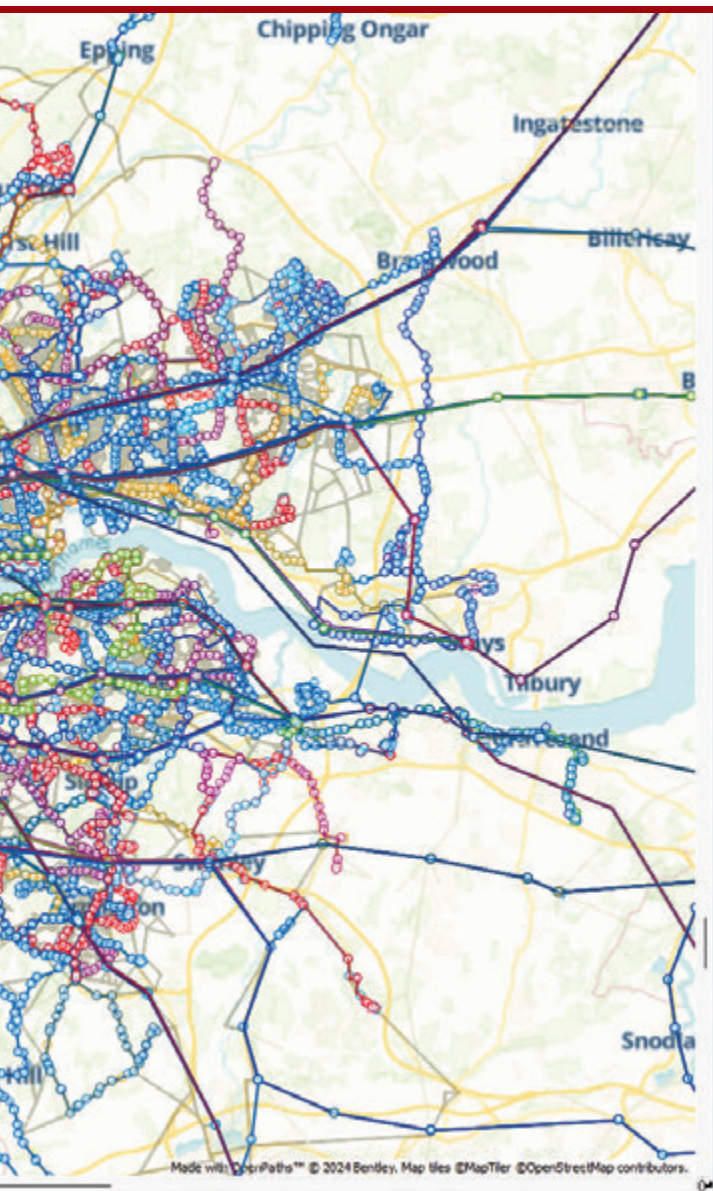


Image courtesy of Transport for London.

Project Summary

Organization

Transport for London

Solution

Rail and Transit

Location

London, England, United Kingdom

Project Objectives

- To support economic growth by tackling congestion on the existing rail network and improving rail access into and within London.
- To create forecasts of demand, revenue, and social benefits for business case development for the continued improvement of public transportation models.

Project Playbook

OpenPaths, LEGION

Fast Facts

- The Elizabeth Line is the largest single addition to London's public transport network since the Victoria Line in 1968.
- Transport for London (TfL) chose OpenPaths EMME software due to the scale, complexity and importance of crowding on the public transport system.

ROI

- An additional 1.5 million people are now within 45 minutes of Central London, and congestion on the rail network is reduced.
- TfL used OpenPaths EMME to deliver 200 million passenger forecast which is within 10% of actuals, setting benchmarks for appraisal speed and accuracy.
- TfL forecasts 10 million fewer car journeys per year to transfer to the Elizabeth Line, and a net reduction of 24.6 million fewer grams of carbon emissions per day.

for 1,500 passengers per train and served 210 million passengers in 2023-2024, transforming how passengers use public transport within London.

Transport for London (TfL) is the local government organization responsible for most aspects of London's transport system, running the day-to-day operation of the capital's public transport network and managing London's main roads. "Created in 2000, TfL run and manage bus services, the Underground, Docklands Light Railway, overground, tram, road and river networks, and a cable car," explained David Warner, principal transport modeler at TfL. "Now, the Elizabeth line has been added, including another 10% of capacity to the rail network."

Change in AM Peak Period Passenger Volumes due to the Elizabeth Line

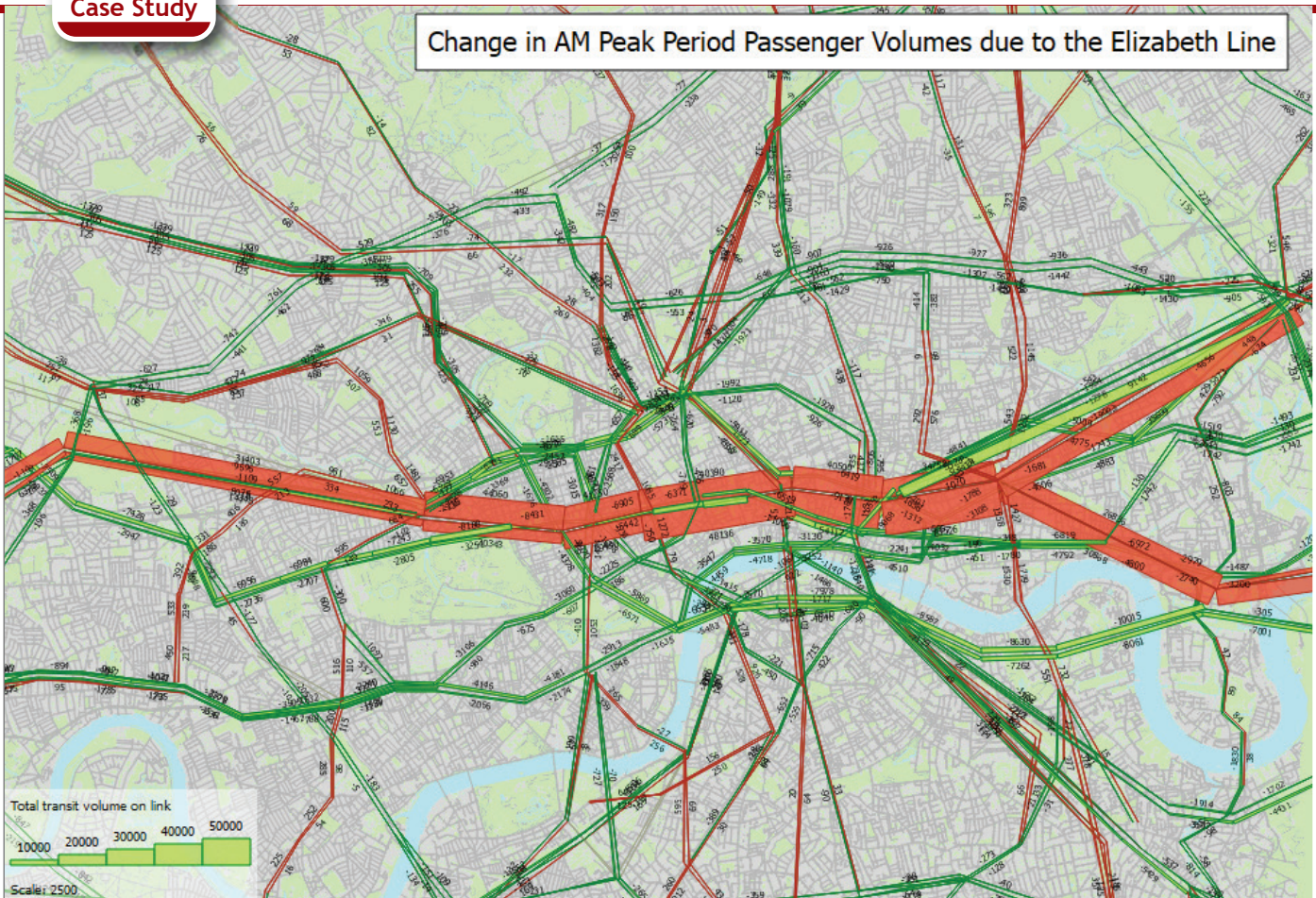


Image courtesy of Transport for London.

Change in a.m. peak period passenger volumes due to the Elizabeth Line.

Without the efficiency and stability of the OpenPaths EMME software, developing a model as large and as sophisticated as Railplan simply wouldn't have been possible

David Warner,
Principal Transport Modeler,
Transport for London

Planning public transport in London for over 20 years

The Elizabeth line stretches more than 100 kilometers in the west through central tunnels in the east. "Construction of the GBP 19 billion project started in 2011, and we had a phased opening between May 2022 and May 2023," said Hannah Donovan, transport modeler at TfL. But the planning work started much earlier, before even the 2008 Crossrail Act was submitted to UK Parliament as a mechanism to fund and deliver the route. Given the scale and complexity of the project, a suitable tool was required to inform planning decisions.

TfL sought transportation planning, modeling, and analysis software to assist with conceptual creation, route selection, and final delivery of the operational railway. "Journey times and connectivity are key drivers of public transport demand in London," said Donovan. Therefore, the team needed to be able to easily update plans and proposals as changes arose, including travel patterns, fares, and passenger behavior.

Forecasting the Elizabeth Line in an evolving London

TfL chose OpenPaths EMME to create Railplan, a model that creates forecasts of demand, revenue, and social benefits for business case development and financial assessments of the line. "OpenPaths EMME, as the industry leader for forecasting public transport demand across congested urban networks, was the natural choice, bringing consistency of modeling application that allowed changes in assumptions and backward looks to be undertaken with ease," said Warner. Donovan added, "OpenPaths EMME software has supported TfL with planning the Elizabeth Line for over 20 years and continues to be used today,

allowing plans and proposals to be updated as land use, travel patterns, fare policy, and passenger response have changed.”

TfL’s Railplan models the likely route and service choices of public transport users to inform outcomes such as anticipated ridership, crowding, distance traveled, and time taken. Railplan incorporates all the services that TfL provides, as well as includes an extensive pedestrian network to represent access to the public transport system and transfer between services. Railplan can predict the rerouting and crowding effects of changes to services or infrastructure and is used to compare the impact of alternative transport provision or land uses, including public transport to and from different locations, the number of people using stops and stations, crowding within public transport vehicles, total passenger travel time and distance traveled by mode.

“OpenPathsEMME’s backwards compatibility have allowed years of forecasts to be consistently assessed and the drivers of variation to be explained. The software is adaptable, allowing the development of solutions to problems that include modeling high-speed rail and different fare/quality structures,” said Warner. The ability to quickly make changes proved more important than anticipated including in the wake of the pandemic. “Increasingly quicker assignment procedures through OpenPaths EMME’s multi-threading capabilities allowed rapid re-evaluation to unexpected uncertainties, such as the pandemic and changing project timescales/scope,” said Warner. When a constrained budget and opening delay, along with the pandemic, meant examining the removal of new stations from the final route, the team was able to quickly test alternatives and then identify which passenger groups needed to be informed. “Without the efficiency and stability of the OpenPaths EMME software, developing a model as large and as sophisticated as Railplan simply wouldn’t have been possible,”

said Warner. TfL also used OpenPaths to reassess phased opening proposals over a 12-month period. The team was able to revise the plan so that they could get started six months sooner, as well as increasing demand by 12 million passengers.

Accurate planning for optimal delivery

By using OpenPaths EMME to power Railplan, the planning team was able to update forecasts over thirty times since 2011 against a range of changed assumptions. “The accuracy and reliability of OpenPaths’ forecasts, including Elizabeth line demand and transfers from existing rail and bus corridors, has resulted in a 200 million passenger forecast that is within 10% of actuals, and ensured that we have a network optimally delivered for today’s needs. This has created a forecasting and appraisal benchmark for speed and accuracy for future projects,” said Donovan.

Ultimately, the Elizabeth line has transformed how passengers use public transport within London, bringing an additional 1.5 million people within 45 minutes of Central London, alleviating rail network congestion. TfL also forecasts 10 million fewer car journeys per year, reducing traffic congestion and road accidents, and provides a net reduction of 24.6 million fewer grams of carbon emissions per day. The line’s construction has boosted the local economy, with 96% of contracts awarded locally within the UK and creating 1,000 apprenticeships. “Railplan has a crucial role in planning the provision of public transport in London. The use of the tool spans tactical tasks, such as informing alternative provision during planned closures, to the most strategic, such as informing the development of mega infrastructure projects,” said Stefan Trinder, principal transport planner at TfL. “The flexibility of the software Railplan is built in means it can adapted for ever-more use cases.”

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Daniel Florian is a senior director at Bentley Systems, where he is responsible for mobility simulation and analytics products and makes active contributions to the OpenPaths multimodal transport planning products. He has over twenty years of technical and application expertise in multimodal network modelling and transportation forecasting applications, regularly engaging with users on a variety of modeling and technical matters. Daniel completed his master’s degree at MIT where he held a research position at the Intelligent Transportation Systems lab.

The oil and gas sector in India serves as a cornerstone of the country's energy infrastructure, driving economic growth, industrial development, and in meeting the vibrant energy demand mix. EPC World News Bureau takes a closer look onto the sector's evolution and growth scope being outlined...

Fuelling the Future



India is the third-largest consumer of oil and gas in the world, after the United States and China. The sector play a critical role in meeting the country's energy requirements, economic growth, and in guaranteeing energy security. The rapidly evolving economy along with the growing population, industrialization and urbanisation jointly contributes in accelerating the sector's growth prospects.

The country has a vibrant mix of energy and oil reserves owing to its rich geographic terrain and abundant mineral reserves. But, when compared to its global counterparts, India has relatively modest oil and gas reserves compared to other major oil-producing countries. However, the country's significant potential in exploration and production (E&P) sector opens immense potential for the sector to propel. Adding to this are the ongoing

infrastructure developments, and governmental reforms offering promising prospects for the sector. The exploration of untapped offshore reserves, the rise in natural gas consumption, and a push towards cleaner energy sources such as LNG and biofuels further highlight the sector's growth potential.

At a Glance

According to the official Government data, the country's crude oil production stood at 13.26 MMT during April-September 2024. The recent market study from IBEF indicates an increase in Indian refining capacity, from 215.1 Million Metric Tons Per Annum (MMTPA) to 256.8 MMTPA in last 10 years. And it is projected to increase to 309.5 MMTPA by the year 2028. The study further added that, India is expected to be one of the largest contributors to non-OECD petroleum consumption growth globally. The consumption of petroleum products has increased from 158.4 million metric tons (MMT) in the fiscal year 2013-14 to 234.3 MMT in the fiscal year 2023-24. High-Speed Diesel was the most consumed oil product in India and accounted for 38.6 per cent of petroleum product consumption in FY23.

India's consumption of petroleum products stood at almost 4.44 million barrels per day (BPD) in FY23, up from 4.05 million BPD in FY22. India's crude oil production stood at 13.26 MMT during April-September 2024. India's LNG import stood at 30,917 million metric tonnes (April 2023-March 2024). According to the International Energy Agency (IEA), consumption of natural gas in India is expected to grow by 25 BCM, registering an average annual growth of 9 per cent until 2024.

As of June 1, 2024, India had 10,941 km of crude pipeline network, with a capacity of 153.1 MMTPA. The oil and gas production is expected to achieve a mid-decade peak between 2023-2032, around 2027, driven by the KG-Basin projects operated by Reliance Industries Limited and Oil and Natural Gas Corporation (ONGC), stated the IBEF findings.

"With 12,581 kms of refined products pipeline in India, the Indian Oil Corporation Limited (IOCL) leads the segment with 53.84 per cent, as of June 1, 2024. The total number of OMC retail outlets increased to 90,165, as of May 1, 2024, from 59,595 in FY17. IOCL owned the highest number of retail outlets (37,511), followed by



HPCL (22,050), and BPCL (21,865). The number of LPG distributors stood at 25,489 (under PSUs) in India.

Budget Benefits

In the Union Budget for 2025-26, significant allocations and policy measures have been introduced to enhance India's oil and gas sector, aiming to bolster energy security and promote sustainable growth. The government has earmarked approximately 5,932 crore for the development and maintenance of strategic oil reserves. This investment aims to strengthen the nation's energy security by ensuring a buffer against global supply disruptions. To alleviate the financial burden on consumers, especially in the context of LPG pricing, the budget includes provisions for compensating LPG under-recoveries.

Allocations have been made for the operation, maintenance, and expansion of SPR facilities, including funds for land acquisition and the construction of new caverns. These initiatives are part of a broader strategy to enhance storage capacity and safeguard against supply shocks. The budget also emphasized on the promotion of cleaner energy alternatives, including biomass and biofuels. Financial support has been allocated to encourage the adoption of these fuels, aligning with India's commitment to reducing carbon emissions and transitioning to renewable energy sources.

Trend Transformations

Driven by technological advancements, policy reforms, and evolving consumer demands, the sector drives to attain sustainable and prospective goals. A noteworthy change is seen in the inclination towards natural gas reserves. With the government's aim to raise the share of natural gas from 6-7 per cent to 15 per cent by 2030, natural gas is seen as a cleaner and more efficient alternative to coal and oil. The shift towards LNG (Liquefied Natural Gas) is gaining momentum, supported by infrastructure projects like the expansion of gas pipelines and LNG terminals.

Abiding to its commitment to reduce carbon emissions, India is prioritizing cleaner fuels and renewable energy sources. An increased focus is seen towards the use and

promotion of biofuels, including bio-CNG and ethanol, which are seen as important for reducing dependence on fossil fuels. Additionally, the Indian government is exploring the possibility of using hydrogen as a fuel source, especially in sectors like transportation and industry. Private companies, including Reliance Industries, Adani Group, and Vedanta, are diversifying into various segments of the oil and gas value chain. This includes increasing investments in exploration and production, refining, and even renewable energy. For example, Reliance has shifted focus toward clean energy while still maintaining its dominant position in refining.

The government's push to attract foreign investment is evident in reforms such as the Hydrocarbon Exploration and Licensing Policy (HELP) and Discovered Small Fields Policy, which allow more flexible exploration contracts and encourage private and foreign players to enter the Indian market. This has led to increased interest from global companies in India's upstream sector.

Furthermore, India has been expanding its strategic petroleum reserves to safeguard against oil supply disruptions. The government is investing in new SPR facilities, particularly underground storage caverns, to ensure a strategic buffer that could last up to 10-15 days in case of emergency.

Embracing the Tech Waves

A thoughtful and future centric vision is also being observed in the adoption of technologies, especially towards the implementation of Artificial Intelligent Tools and IoT based applications. One such approach, is the increased use of Enhanced Oil Recovery (EOR) technique to improve the productivity of aging fields. EOR methods involve injecting fluids or gases into reservoirs to increase pressure and extract more oil. This method is gaining traction in India, where CO₂ is injected into reservoirs to improve oil recovery and reduce carbon emissions by storing the CO₂ underground. Using chemicals like surfactants, polymers, and alkalis, Indian companies are enhancing recovery rates in mature oil fields.

Advanced seismic imaging technologies, such as 3D and 4D seismic surveys, are being used in

India to map subsurface reservoirs more accurately. These technologies help in understanding reservoir behaviour, reducing exploration risks, and improving production efficiency. Technological advancements in hydraulic fracturing (fracking) and horizontal drilling are revolutionizing India's oil and gas exploration, particularly in shale formations and tight reservoirs.

IoT technology is being extensively used in monitoring and managing assets in real-time. Sensors and connected devices help operators gather data on the performance and condition of equipment, pipelines, and other critical infrastructure. Considerable investments are also flown towards Carbon Capture, Utilization, and Storage (CCUS) technologies to reduce greenhouse gas emissions from the oil and gas sector. These technologies capture CO₂ emissions and either store them underground or use them in other processes.

Blockchain is being explored in the sector to increase transparency and efficiency in supply chains and transactions. The use of blockchain-based smart contracts automates the execution of agreements in the oil and gas supply chain, making transactions faster and more reliable.

The oil and gas industry in India is also increasingly integrating renewable energy into its operations to align with the global shift toward cleaner energy. This includes the use of solar, wind, and bioenergy to power operations, reduce dependence on fossil fuels, and meet sustainability goals.

Growth Hiccups

Despite its increased prospects and positive evolution, the oil and gas sector in India is still masked by numerous growth glitches – stemming from internal and external factors. The main among them being the heavy reliance on imports for crude oil. This dependence on foreign sources exposes the country to fluctuations in global oil prices and geopolitical risks. Owing to which the sector is highly vulnerable to price volatility in international markets, leading to inflationary pressures, higher fuel costs, and economic instability.

India's pipeline network is not extensive enough to meet the growing demand for oil and gas. The lack of adequate infrastructure often leads to delays in fuel distribution and higher

transportation costs. A shortage is also seen in the sufficiency of storage facilities for both crude oil and refined products, leading to inefficiencies in the supply chain.

The stakeholders involved in the sector also uniformly highly the worrying concern on frequent changes in policies, taxes, and regulations – resulting in an uncertain investment environment. Issues such as fluctuating fuel taxes and unclear taxation rules for upstream and downstream companies create obstacles for long-term planning and investment.

The sector is one of the largest contributors to India's carbon emissions. As the country commits to reducing its emissions in line with global climate goals, oil and gas companies must transition to cleaner energy alternatives. The rise of renewable energy, driven by government incentives and falling prices, may reduce the demand for traditional fossil fuels in the long run. This could lead to an oversupply of oil and gas, affecting profitability.

Another worry is towards the adoption of new-gen technologies. While there is growing interest in technologies like AI, machine learning, and automation, the sector's full potential is yet to be realized due to the high costs and lack of skilled labour to implement these technologies. The industry's reliance on conventional extraction techniques and the lack of substantial investment in research and development (R&D) for new and cleaner technologies are limiting growth.

Last but not the least is the critical concern over the availability of skilled labour. The industry faces challenges in recruiting and retaining a skilled workforce, particularly in technical roles. The gap in skilled professionals, including engineers, data scientists, and technicians, is limiting the sector's ability to embrace advanced technologies.

Addressing these challenges will require coordinated efforts from the government, industry stakeholders, and technology providers to foster innovation, improve efficiency, ensure sustainability, and create a more resilient energy ecosystem. The future growth of India's oil and gas industry depends on its ability to navigate these challenges while adapting to global trends in energy consumption and environmental protection.

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Enhancing safety, sustainability and aesthetics

In recent years, roofing solutions, once seen as mere structural coverings, have evolved significantly. Modern roofing now integrates safety, sustainability, and aesthetics, offering enhanced durability and energy efficiency. With advancements in technology, roofing solutions are becoming more customized, incorporating smart features like heat-reflective coatings and solar integration to improve indoor comfort. This article explores the latest trends in roofing solution...



A building's roof is more than just a protective covering - it plays a crucial role in ensuring structural integrity, energy efficiency, and aesthetic appeal. As construction practices evolve and sustainability takes center stage, the roofing industry is witnessing a shift toward advanced materials, innovative designs, and eco-friendly solutions. From traditional clay tiles to modern solar-integrated roofs, the sector is adapting to meet the demands of durability, cost-effectiveness, and environmental responsibility. Roofing options today are diverse, catering to different climates, architectural styles, and budget considerations. Some of the most common types include asphalt shingles, which are cost-effective and widely used in residential construction; metal roofing, known for its durability and energy efficiency; and concrete or

clay tiles, which provide a classic aesthetic with excellent longevity. For eco-conscious buildings, green roofs with vegetation layers and solar roofs integrating photovoltaic panels are gaining traction. Additionally, flat and membrane roofs are commonly used in commercial structures for their low maintenance and energy efficiency benefit. According to latest industry report, polycarbonate roofing sheets are gaining popularity due to their ease of installation and suitability for industrial and large-scale commercial buildings. Known for their durability and weather resistance, these sheets require minimal maintenance and are available in a variety of textures and designs. Beyond conventional applications, polycarbonate sheets are widely used in skylights, swimming pools, walkways, and display signboards, thanks to their lightweight nature and ability to allow natural light while blocking harmful UV rays. Their versatility and long lifespan make them a preferred choice across multiple sectors, driving their increasing demand in the roofing market. The roofing market caters to a broad spectrum of applications, ranging from residential housing and commercial complexes to industrial warehouses and large-scale infrastructure projects. Each segment has unique requirements, influenced by factors such as climate conditions, durability, energy efficiency, aesthetics, and structural integrity. While residential buildings often prioritise cost-effective and visually appealing options, commercial and industrial sectors demand high-performance roofing solutions that offer longevity, insulation, and weather resistance.

Expanding market

The Indian roofing industry is experiencing remarkable growth, driven by rapid urbanization, industrial expansion, and a surge in large-scale infrastructure projects. With government initiatives such as Smart Cities, airport modernization, affordable housing, and highway construction gaining momentum, the demand for durable, cost-effective, and energy-efficient roofing solutions is on the rise. "India's industrial and infrastructure growth in recent years has been nothing short of impressive, and it is certainly creating new opportunities for the roof and wall cladding solutions market. With Government focusing on ambitious infrastructure projects like the National Infrastructure Pipeline and the Smart Cities Mission, the demand for reliable, durable,



and energy-efficient roofing materials is increasing significantly,” says Anoop Kumar Trivedi, Managing Director, Tata BlueScope Steel. Additionally, the shift towards sustainable construction practices has increased interest in eco-friendly roofing materials like solar-integrated roofs, green roofs, and cool roofing systems that help reduce energy consumption. According to Mordor Intelligence, the India Roofing Market size is estimated at USD 8.08 billion in 2025, and is expected to reach USD 11.07 billion by 2030, at a CAGR of 6.5 percent during the forecast period (2025-2030).

Emerging technology trends

The roofing industry is evolving rapidly, integrating new technologies and innovations that enhance performance, durability, and sustainability. With a growing emphasis on energy efficiency and



environmental responsibility, green and sustainable roofing solutions are gaining much-needed attention. Cool roofing systems, designed with reflective coatings and adequate insulation, help mitigate urban heat effects while reducing energy consumption. Similarly, solar rooftops and Building-Integrated Roofing (BIR) solutions are emerging as key trends, allowing roofs to seamlessly incorporate solar panels, green roofing, and rainwater harvesting systems without compromising aesthetics. Smart roofing systems equipped with IoT sensors are becoming more common, enabling real-time monitoring of temperature, moisture levels, and structural integrity. These technologies allow predictive maintenance, reducing repair costs and enhancing longevity. Additionally, drones and 3D scanning technologies are transforming the way roofing projects are planned, managed, and executed,

improving accuracy and efficiency in installations and inspections. Modular roofing systems are also gaining traction due to their high level of customisation, allowing structures to meet specific building codes and aesthetic preferences while offering a flexible and scalable solution for residential, commercial, and industrial buildings.

The rise of artificial intelligence (AI) and machine learning is further revolutionizing roofing design, installation, and maintenance. AI-driven analytics help in selecting optimal materials, predicting weather-related wear and tear, and automating project planning. Meanwhile, automated systems and robotics are being developed to assist with roof installation, maintenance, and repair, reducing labor-intensive tasks and improving precision. The industry is also seeing advancements in self-healing roofing materials, which use nanotechnology to repair minor cracks and leaks, extending the roof's lifespan. As sustainability and efficiency continue to drive innovation, the roofing industry is poised for transformative advancements. From fire-resistant and impact-resistant roofing to prefabricated and modular roofing solutions, modern technologies are making roofing more durable, cost-effective, and environmentally friendly. With ongoing developments, the future of roofing will be defined by smarter, greener, and more integrated systems that enhance both functionality and aesthetics.

Challenges galore amidst steady growth

Though the roofing industry has grown rapidly in recent years, there are galore of challenges that are hindering further growth of the industry. One major challenge is the high initial cost of advanced roofing solutions, such as solar-integrated roofs, insulated panels, and green roofing, which limits their adoption, particularly in cost-sensitive segments. Furthermore, the fragmented nature of the industry, with a mix of organised and unorganised players, leads to inconsistencies in product quality, pricing, and distribution. The fluctuating prices of raw materials, particularly steel, aluminum, and polycarbonate, have made cost estimation a significant challenge for both manufacturers and consumers. The lack of awareness about modern roofing solutions remains a challenge, particularly in rural and semi-urban areas, where traditional materials are still widely

preferred despite the benefits of energy-efficient and durable options. “Educating consumers about the benefits of high-quality, long-lasting steel roofing solutions, compared to lower-grade alternatives, is one of the key aspects of all our brand campaigns. Emphasizing on quality, durability and sustainability attributes of our solutions, plays a major differentiator as compared to the unorganized sector,” says Anoop Kumar Trivedi.

The sector also faces a skilled labour shortage, making the installation of advanced roofing systems, such as standing seam metal roofs and modular roofing panels, more difficult. Furthermore, India’s diverse and extreme weather conditions, including heavy monsoons, high temperatures, and cyclones, require roofing materials that can withstand environmental stress, adding to the complexity of material selection. Sustainability and recycling issues persist due to the lack of a structured framework for repurposing roofing waste. Additionally, regulatory hurdles and weak enforcement of building codes result in subpar installations and non-compliance with safety standards. The slow adoption of smart roofing technologies, such as IoT-enabled monitoring and AI-driven predictive maintenance, is another setback, as these solutions require significant investment and technical expertise.

Moreover, logistics and supply chain disruptions affect the timely availability of roofing materials, particularly in remote locations, leading to project delays and increased costs. Despite these challenges, the Indian roofing industry is steadily evolving with technological advancements, improved regulatory frameworks, and growing awareness of energy-efficient and sustainable solutions, paving the way for long-term growth and innovation.

Metal roofing in demand

Of late, there has been a significant increase in the use of metal roofing, driven by the growing demand for Pre-Engineered Buildings (PEBs) across industrial, commercial, and infrastructure projects. According to Research and Market report, the India metal roofing market is projected to grow at a CAGR of 7.8% between 2024 and 2032 to reach a value of about USD 2.439 billion by 2032. As PEBs offer faster construction, cost efficiency, and structural flexibility, the need for durable, lightweight, and low-maintenance roofing solutions has surged. Metal roofing sheets,

particularly galvanized and galvalume-coated steel, have emerged as the preferred choice due to their high strength, corrosion resistance, and long lifespan, making them ideal for warehouses, factories, and large commercial spaces. Additionally, advanced roofing solutions such as standing seam metal roofs are gaining popularity due to their superior water-tightness, energy efficiency, and aesthetic appeal. In many PEB structures, polycarbonate roofing sheets are also incorporated to allow natural light penetration, reducing electricity consumption and creating well-lit workspaces. For temperature-controlled environments such as cold storage units and food processing plants, insulated sandwich panels with a polyurethane or mineral wool core provide excellent thermal efficiency and soundproofing. With industries, logistics hubs, and commercial



establishments increasingly opting for PEBs, the metal roofing segment is poised for sustained growth. Innovations in roofing materials, including reflective coatings and high-strength alloys, are further enhancing the performance and longevity of these solutions, ensuring that they remain a cornerstone of modern construction.

Sustainability-centric roofing solutions

With environmental degradation reaching critical levels, the focus has increasingly shifted toward sustainability. The construction industry, being a major contributor to greenhouse gas emissions, is under growing pressure to adopt greener practices. As a result, sustainability in roofing has emerged as a key priority, driving the adoption of eco-friendly and energy-efficient solutions. Green roofing systems, such as solar-integrated roofs, cool roofs, and vegetative roofing,



are gaining traction due to their ability to reduce energy consumption, improve insulation, and mitigate the urban heat island effect. Additionally, the use of recycled and sustainable materials, such as metal roofing, clay tiles, and fiber cement sheets, is being promoted to minimize environmental impact. “As a leading player in coated steel, our commitment to sustainability is deeply embedded in our operations and products. We understand that the future of architecture lies in innovative solutions that seamlessly integrate mankind and nature. We closely work with architects, builders, and industry bodies to promote sustainable construction practices and drive the adoption of green building materials. Our products are aligned with green building certifications such as LEED (Leadership in Energy and Environmental Design), EPD and GRIHA (Green Rating for Integrated Habitat Assessment),” says Anoop Kumar Trivedi.

The Indian government has introduced several initiatives to encourage sustainable roofing solutions. Programs like Pradhan Mantri Awas Yojana (PMAY) emphasise the use of durable and energy-efficient roofing materials in affordable housing projects. Similarly, the Energy Conservation Building Code (ECBC) mandates energy-efficient roofing in commercial buildings, while the Smart Cities Mission promotes the adoption of green infrastructure, including sustainable roofing solutions. Additionally, incentives for solar rooftop installations under the Rooftop Solar Programme aim to accelerate the adoption of solar-integrated roofing, reducing dependency on conventional energy sources. These initiatives, coupled with rising awareness among builders and consumers, are driving the transition towards sustainable roofing solutions in India, ensuring long-term environmental and economic benefits.

Growing market opportunities

The Indian roofing market presents immense growth opportunities, driven by rapid urbanisation, infrastructure expansion, and increasing demand

for durable and energy-efficient solutions. Government initiatives such as Pradhan Mantri Awas Yojana (PMAY), Smart Cities Mission, and Housing for All are fueling demand for modern roofing materials in residential and commercial projects. The shift towards pre-engineered buildings (PEBs) in industrial and warehouse construction has significantly boosted the demand for metal roofing systems, offering roofing players a lucrative business avenue. Additionally, the rising awareness of sustainable and energy-efficient solutions, including cool roofs, solar-integrated roofing, and green roofing, has created a new market segment. With the growing push for renewable energy, government incentives for rooftop solar installations provide further opportunities for players offering integrated solar roofing solutions. The expansion of tier-2 and tier-3 cities and increased investments in commercial real estate also contribute to rising roofing demand. Furthermore, advancements in smart roofing technologies, such as IoT-enabled monitoring, AI-driven predictive maintenance, and modular roofing systems, are paving the way for innovation in the sector. As consumers and businesses seek durable, cost-effective, and climate-resilient roofing, companies that invest in R&D, new materials, and sustainable practices stand to gain a competitive edge in this evolving market.

Road Ahead

As India's construction landscape continues to evolve, the roofing industry is poised for sustained growth, driven by technological advancements, sustainability initiatives, and increasing demand for durable and energy-efficient solutions. However, challenges such as fluctuating raw material costs, lack of awareness in rural areas, and skilled labour shortages must be addressed to unlock the sector's full potential. With roofing playing a crucial role in enhancing structural longevity, energy conservation, and climate resilience, the industry is set to become a key pillar in India's infrastructure growth story.

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Roofing is more than just protecting the structure



We are deeply committed to contributing for India's growth story by offering innovative, sustainable, and high-quality roof and wall cladding solutions, says **ANOOP KUMAR TRIVEDI**, Managing Director, Tata BlueScope Steel

In recent years, India has witnessed significant industrial and infrastructure growth. How is the demand for roofing solutions evolving in the country?

India's industrial and infrastructure growth in recent years has been nothing short of impressive, and it is certainly creating new opportunities for the roof and wall cladding solutions market. With Government focusing on ambitious infrastructure projects like the Smart Cities Mission, the demand for reliable, durable, and energy-efficient roofing materials is increasing significantly. Initiatives such as Atmanirbhar Bharat and government incentives for green buildings are encouraging the use of eco-friendly materials. Affordable Housing is driving further demand in both urban and rural areas. Sector specific investments / plans such as Gati Shakti National Master Plan for metros, Sagarmala Project for ports along with NMDP focuses on enhancing port infrastructure to boost trade. Airports in India too are undergoing major revamp to cater to the growing air travel demand through National Civil Aviation Policy and the Airport Privatization Scheme. Furthermore, with extreme weather conditions becoming more frequent due to

climate change, the need for roofing materials that are resilient to environments such as heat, rain, and storms is gaining attention. Policies that encourage energy efficiency, such as the promotion of solar roofs and energy-saving materials, are shaping the future of the roofing market in India. At Tata BlueScope Steel, we are deeply committed to contributing for India's growth story by offering innovative, sustainable, and high-quality roof and wall cladding solutions. We are sensitive towards the fact that roofing is more than just protecting the structure, it is about supporting the vision of a sustainable and more resilient India, making us confident about opportunities for growth in this space.

What are the latest technological trends and innovations shaping the roofing industry?

The roofing industry is evolving rapidly integrating new technologies and innovations that are enhancing performance, durability, and sustainability for the structure. Technologies in green and sustainable roofing are gaining much needed focus. Cool roofing with adequate insulation mitigates urban heat effects and energy consumption. In addition, solar rooftops are emerging trends. Smart

roofing systems with sensors embedded in the materials are becoming more common. Drones and 3D scanning technologies are transforming the way roofing projects are managed and executed. BIR (Building Integrated Roofing) is being used to incorporate solar panels, green roofing, and other systems like rainwater harvesting directly into the design and structure of the roof, maximizing functionality without compromising aesthetics. Modular roofing systems are highly

economic value. The use of coated steel for structures, roofing and wall cladding is growing rapidly because of its aesthetic appeal and longer life span. Tata BlueScope Steel offers business integration that designs, manufactures, distributes, constructs and services a wide portfolio of coated steel building and construction solutions.

The company's offerings include cladding solutions in the form of coils, profiles, structural products, and accessories.

Class Safety practices. The retail distribution of roof and wall cladding sheets is done under DURASHINE® brand. In addition to its premium range, Tata BlueScope Steel has entered the mid-range of roof and wall cladding offerings manufactured at Tata Steel's Meramandali and Khopoli plant; marketed as PRISMA® which has been recently launched to increase our customer base and delightful experience. Also, the company's focus is more on customer experience throughout their journey from concept to deployment to after sales.



India's roofing market is highly competitive, with a significant presence of unorganized players. Given this landscape, what strategies are you implementing to expand your market share?

Educating consumers about the benefits of high-quality, long-lasting steel roofing solutions, compared to lower-grade alternatives, is one of the key aspects of all our brand campaigns. Emphasizing on quality, durability and sustainability attributes of our solutions, plays a major differentiator as compared to the unorganized sector. Strengthening our distribution channel with well trained staff and technical experts further assists customers for informed decision. Offering strong after-sales service, including installation support and warranties, adds value to the product and enhances customer loyalty. Other than these, the legacy of our brands existence has become a hallmark of uncompromised quality and trust. Through several outreach initiatives for every player in our value chain, Tata BlueScope Steel ensures transparency, awareness, and handholding, fostering long-term relationships and empowering stakeholders with the knowledge and tools to make informed decisions, thereby strengthening trust and collaboration across the roofing ecosystem.

customizable and can be designed to meet specific building codes and aesthetic preferences, offering a flexible solution for both residential and commercial buildings. Artificial Intelligence (AI) and machine learning are playing a growing role in roofing design, installation, and maintenance. Automated Systems and robots are being developed to assist with roof installation, maintenance, and repair.

What are the roofing products and services your company provides?

Steel has become a universally preferred building material due to its strength, versatility, durability and

The JV has brought along some iconic brands such as ZINCALUME® steel and COLORBOND® steel – aesthetically superior colour coated steel along with LYSAGHT® range of roof & wall cladding profiles and structural products, especially catering to the B2B markets. LYSAGHT® range of products, include concealed fixed roofing systems, screw-down roofing and wall cladding profiles, and structural products. It also produces a suit of accessories like trims, skylight and louvers. In addition, the division also provides value added services in form of Roof Diagnostics, AMC and Construction Services with Best-in-

What steps have you taken to safeguard your roofing products against counterfeiting?

Tata BlueScope Steel products feature a distinctive brand mark designed to protect against counterfeiting. This mark ensures the authenticity and quality of the steel products, providing customers with confidence in their purchase. It serves as a safeguard, promoting transparency and trust in the brand's commitment to excellence.

What steps has your company taken to enhance the sustainability of your roofing products and to support green building initiatives?

As a leading player in coated steel, our commitment to sustainability is deeply embedded in our operations and products. We understand that the future of architecture lies in innovative solutions that seamlessly integrate mankind and nature. We closely work with architects, builders, and industry bodies to promote sustainable construction practices and drive the adoption of green building materials. Our products are aligned with green building certifications such as LEED (Leadership in Energy and Environmental Design), EPD and GRIHA (Green Rating for Integrated Habitat Assessment). By supporting these standards, Tata BlueScope Steel helps customers achieve environmentally conscious and energy-efficient buildings. Our roofing solutions are thermally efficient with Thermatech® technology integrated in its paint system. The durability and longevity of our products also mean less frequent replacements, contributing to long-term sustainability.

What are the after sales services you provide?

Tata BlueScope Steel offers comprehensive after-sales services to ensure the optimal performance and longevity of its roofing and cladding

solutions. From design, supply to professional installation services, a team of experts provide continuous support and guidance throughout the project lifecycle. This includes maintenance, repairs, and tailored solutions to meet specific customer needs, ensuring that each installation remains durable and efficient for years to come. To ensure sustained serviceability, Tata BlueScope Steel offers AMCs and maintenance services, addressing potential issues proactively and extending the lifespan of

the company's presence in emerging markets, enhancing manufacturing capabilities, and expanding distribution network to meet the growing demand for sustainable and high-performance roofing solutions.

In terms of innovation, Tata BlueScope Steel is investing in advanced technologies to develop products that offer greater durability, energy efficiency, and environmental sustainability. We are also exploring new material technologies and coatings



the roofing systems. These after-sales offerings reflect Tata BlueScope Steel's commitment to delivering high-quality products backed by exceptional customer support, ensuring that clients receive enduring value and satisfaction from their roofing and cladding investments.

What are your future expansion plans, and can you share insights into any upcoming innovations or new product launches in your roofing solutions portfolio?

Tata BlueScope Steel's future expansion plans include strengthening

to enhance the performance of our roofing solutions in diverse climates and challenging conditions. Recently the company has had some very exciting product launches with enhanced functionality and performance orientation. Products like PRISMA®, PROSHEEN™, COOLSHIELD® offer new roofing systems that integrate cutting-edge features such as improved thermal insulation, enhanced corrosion resistance, and eco-friendly coatings; without compromising on strength and aesthetics.

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For Space Booking & Partnership

M: +91 99404 59444
E: julian.thomas@informa.com

M: +91 99673 53437
E: iyer.narayanan@informa.com

M: +91 93792 29397
E: amitava.sarkar@informa.com

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India's construction sector is rapidly embracing PEBs for their speed, cost efficiency, and sustainability. Once limited to warehouses and industrial sheds, PEBs are now widely used in logistics, e-commerce, manufacturing, and infrastructure projects. This article explores the rising demand, key benefits, challenges, and the transformative potential of PEBs in reshaping India's infrastructure landscape

Building faster, smarter, greener!



In recent years, the market for Pre-Engineered Buildings (PEB) has witnessed significant growth, driven by the increasing demand for faster and more efficient construction solutions. Once considered a niche segment, the PEB industry has emerged as a key player in the infrastructure sector, gaining traction across multiple industries. One of the primary drivers of this growth has been the rapid expansion of e-commerce, which requires extensive warehousing facilities to store and manage inventory efficiently. The rise of quick-commerce (Q-commerce) has further accelerated this demand, as companies seek strategically located, ready-to-use distribution hubs to fulfill orders with minimal turnaround time. Over the years, not only e-commerce and quick-commerce players but also companies in manufacturing, electrical and electronics, food and beverages, pharmaceuticals, third-party logistics (3PL), engineering, and FMCG have been rapidly expanding their operations. To support this growth, these industries are increasingly adopting Pre-Engineered Buildings

(PEB) due to their numerous advantages. PEB structures offer faster construction timelines, cost efficiency, and design flexibility, making them ideal for large-scale industrial and commercial applications. Additionally, they are highly durable, environmentally sustainable, and easily expandable to accommodate future growth. With streamlined manufacturing, precision engineering, and quick on-site assembly using nut-and-bolt connections, PEB ensures minimal project downtime, allowing businesses to scale operations efficiently while maintaining structural integrity and operational efficiency. Warehouses, which are predominantly constructed using Pre-Engineered Buildings (PEB), have seen substantial growth in demand. According to a report by Colliers, industrial and warehousing leasing reached 20.2 million square feet between January and September 2024, marking a 17% year-on-year increase across the top five cities in India. Notably, the quarterly average space absorption has risen consistently from 5.7 million square feet in 2021 to 6.7 million square feet in 2024, highlighting the steady and robust expansion of the industrial and warehousing sector. Demand from these sectors for PEB structures has led to exponential growth in the industry, transforming it into a key player in modern infrastructure development by reshaping the way industrial, commercial, and logistics spaces are constructed. According to Market Research Future, the India pre-engineered buildings market size was valued at USD 0.4686 billion in 2023. India pre-engineered buildings industry is projected to grow from USD 0.501 Billion in 2024 to USD 0.888 billion by 2032, exhibiting a compound annual growth rate (CAGR) of 7.40% during the forecast period (2024 - 2032).

Technology Advancement

Technology has played a crucial role in advancing Pre-Engineered Buildings (PEB), making the design, manufacturing, and construction processes more efficient, precise, and cost-effective. Unlike traditional construction, PEB relies on specialised structural analysis and detailing software. Key software solutions used in PEB include TEKLA Structures, MBS (Metal Building Software), STAAD.Pro, and ETABS. These tools help engineers perform structural analysis, load calculations, and connection detailing with high accuracy, ensuring compliance with safety standards



and optimizing material usage. TEKLA Structures is widely used for 3D modeling, steel detailing, connection design, and fabrication, streamlining the transition from design to production. STAAD.Pro and ETABS aid in analyzing wind loads, seismic resistance, and other structural parameters to ensure durability and stability.

In manufacturing, automation has significantly enhanced efficiency. CNC (Computer Numerical Control) machines, roll-forming technologies, and robotic welding allow for precision cutting, drilling, and assembling of steel components, reducing human error and speeding up production. These advancements ensure uniform quality and minimize material wastage. The erection of PEB structures has also benefited from technology. Automated lifting equipment and bolted connections enable quick assembly on-site without the need for extensive manual labor or welding. Prefabricated components arrive at the site ready for installation, drastically reducing construction time.

Steel price volatility: A key challenge

The volatility in steel prices continues to have a significant impact on the Pre-Engineered Building (PEB) industry, as steel remains its primary raw material. Over the past few years, factors such as the Russia-Ukraine war, global supply chain disruptions, and fluctuating iron ore and coking coal prices have driven sharp increases in steel costs. This unpredictability has made it difficult for PEB companies to finalize contracts, as sudden price fluctuations affect project feasibility and financial planning. The high export demand for steel and supply chain constraints have further contributed to drastic price swings, creating challenges for manufacturers and project developers. These rapid changes have pressured the financials of PEB



companies, compelling them to renegotiate pricing with customers.

To mitigate the impact of steel price volatility, PEB players have secured long-term procurement contracts with leading steel OEMs. Furthermore, their long-standing partnerships with manufacturers also came to the rescue during this difficult time. Many companies, we contacted, have adopted a proactive approach by closely monitoring steel market trends, leveraging research data, and strategically pre-ordering raw materials in calculated proportions. This forward-thinking strategy has helped insulate them from sudden price surges, ensuring financial stability and smoother project execution despite ongoing market fluctuations. While steel price volatility remains a challenge, strong supplier relationships, bulk procurement strategies, and market intelligence continue to be key factors in stabilizing project costs and driving sustainable growth in the PEB sector.

Challenges to overcome

Apart from steel price volatility, the PEB industry faces several other challenges that impact its growth and operations. One of the major hurdles is the shortage of skilled labor. While PEB is a technology-driven sector, it still requires trained professionals for design, fabrication, and installation. The lack of expertise in advanced software-based design and precision manufacturing affects project timelines and overall quality. Fluctuating raw material costs also pose a challenge. While steel is the primary component, other materials such as fasteners, insulation panels, coatings, and roofing sheets





also experience price variations, increasing project expenses and squeezing profit margins. Additionally, the industry lacks standardization in design, fabrication, and execution, leading to inconsistencies in quality and structural integrity across projects. Unlike traditional construction, which follows well-defined norms, the absence of uniform guidelines in PEB results in varied project outcomes.

Another significant challenge is the perception and awareness of PEB structures. Many developers and builders still associate PEB with warehouses and industrial buildings, limiting its adoption in commercial and residential projects. Overcoming this mindset and promoting PEB as a viable alternative for various infrastructure needs requires continuous education and marketing efforts. Regulatory hurdles and approval delays further add to the complexities. Different states and regions have varying building codes, zoning laws, and environmental clearances, leading to time-consuming approval processes that slow down project execution. Logistics and transportation constraints are another critical concern. Since PEB components are prefabricated and transported to construction sites, efficient logistics and handling are crucial. Transporting large steel sections over long distances, especially in regions with inadequate infrastructure, increases costs and causes delays. Moreover, the industry faces intense market competition and price wars. The rising demand for PEB has led to a surge in manufacturers, some of whom engage in price undercutting, often compromising on quality and materials to win contracts.

Lastly, environmental regulations and

sustainability concerns are gaining importance. While PEB is considered a more sustainable alternative to conventional construction, the steel industry remains a significant contributor to carbon emissions. The PEB sector must adopt greener building practices, incorporate recycled materials, and comply with evolving environmental regulations to ensure long-term sustainability. Addressing these challenges through strategic planning, technological advancements, and regulatory reforms will be crucial for the continued growth of the PEB industry.

Increasing opportunities

The PEB industry is poised for significant growth, driven by rapid urbanisation, infrastructure development, and the increasing demand for cost-effective and time-efficient construction solutions. The expanding logistics, e-commerce, and warehousing sectors present a massive opportunity, as companies seek large, durable, and quickly deployable storage spaces. Additionally, government initiatives such as the 'Make in India' campaign, industrial corridor projects, and smart cities development are fueling the adoption of PEB structures across various industries. Sectors like manufacturing, automotive, pharmaceuticals, and data centers are increasingly opting for PEB solutions for their Greenfield expansions due to the flexibility, durability, and sustainability these structures offer. The rising popularity of multi-story PEB structures in commercial and institutional projects further expands the market potential. Moreover, the growing focus on sustainability and green building initiatives is making PEB an attractive option, as steel structures are recyclable and reduce construction waste. With advancements in technology, including precision engineering and improved design capabilities, the



PEB industry is well-positioned to capitalize on these opportunities and establish itself as a dominant player in India's construction landscape.

Sustainable construction

India has pledged to achieve net-zero emissions by 2070, and within the construction sector, Pre-Engineered Buildings (PEBs) stand out as a sustainable solution. Compared to conventional construction materials, PEBs offer significant environmental advantages, making them a preferred choice for green building initiatives. PEBs are inherently eco-friendly, as they are primarily made from cold-formed sheet steel, one of the world's most recycled materials. Nearly 95% of steel products can be recycled without losing their engineering properties, making PEBs one of the most sustainable construction options available. Unlike traditional brick-and-mortar structures,



PEBs generate minimal waste even at the end of their lifecycle. Instead of accumulating debris such as concrete, bricks, or dust, these structures produce recyclable metal scrap, ensuring minimal environmental impact. In addition to being recyclable, PEBs are energy efficient. Advanced roofing materials and enhanced ventilation systems help maintain lower indoor temperatures, reducing the need for artificial cooling. Skylights incorporated into the design maximize the use of natural daylight, significantly lowering overall power consumption. Furthermore, many industrial PEB structures are integrating solar panels on rooftops, reducing dependence on conventional energy sources while earning carbon credits under the clean development mechanism. Effective insulation materials, louvers, and rainwater harvesting systems further enhance the

sustainability of these structures.

PEBs also contribute to resource efficiency by minimizing water usage in construction, as opposed to traditional buildings that require extensive wet processes like concrete mixing. Their factory-controlled fabrication ensures high precision, reducing material wastage and optimizing steel consumption. The ease of expansion and reusability of steel components make PEBs an excellent long-term investment for industries seeking scalable infrastructure solutions.

Apart from their environmental benefits, PEBs offer additional advantages such as earthquake resistance, lightweight construction, faster project completion, and flexibility in design. The nut-and-bolt assembly method used in PEB construction ensures minimal site disruption, reducing dust and pollution levels. With growing awareness of sustainability in construction, PEBs are gaining traction among developers, architects, and businesses across India, positioning themselves as the future of eco-friendly and efficient building solutions.

With increasing adoption across various sectors such as logistics, e-commerce, manufacturing, and infrastructure development, PEB has transitioned from a niche concept to a mainstream construction choice. The industry's rapid expansion is fueled by technological advancements, growing demand for quick and scalable structures, and the rising focus on green building initiatives. Despite challenges such as steel price volatility, skilled labor shortages, and regulatory hurdles, the PEB sector continues to evolve with strategic planning, automation, and sustainable construction practices. Its ability to provide durable, energy-efficient, and recyclable structures makes it an ideal solution for India's infrastructure growth while aligning with the country's long-term sustainability goals.

Looking ahead, the PEB industry is poised for sustained growth, driven by urbanization, industrial expansion, and government initiatives like 'Make in India' and smart city projects. As businesses increasingly prioritize speed, flexibility, and environmental responsibility in construction, PEBs will play a crucial role in shaping the future of India's built environment. With continuous innovation and adaptation, the industry is well-positioned to meet the evolving demands of modern infrastructure while contributing to a greener and more resilient construction ecosystem.

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We have made significant strides in expanding our capabilities



Sustainability is at the core of our innovation, driving us to develop environmentally responsible building solutions, says **SRI CHARAN VULCHI**, VP & Business Head, Everest Steel Building Solutions

Pre-engineered buildings have seen significant growth in India. How do you assess this development, and what are the current market trends?

The PEB industry in India has witnessed a remarkable transformation over the last decade. With rapid urbanization, industrial expansion, and infrastructure development, PEBs have become the preferred choice for warehouses, factories, commercial buildings, and even large-scale public infrastructure. Currently, the Indian PEB is growing at a CAGR of over 11-12%. The demand is primarily driven by sectors such as warehousing, logistics, e-commerce, and manufacturing, which require quick and cost-effective construction solutions. With sustainability and efficiency gaining prominence, PEBs will continue to dominate the construction landscape.

What are the key drivers fueling the growth of PEBs in India?

Several factors are driving the growth of this industry. Industrial growth and urbanization are playing a crucial role, as the rise of new industrial hubs and smart cities increases the demand for fast, durable, and

cost-effective buildings. Additionally, the rapid expansion of e-commerce and third-party logistics (3PL) providers has led to massive investments in large warehouse facilities, further fueling the industry's expansion. Sustainability and the demand for green buildings are also contributing to this growth. Pre-engineered buildings (PEBs) are inherently eco-friendly, helping reduce carbon footprints and minimize material wastage. Furthermore, supportive government policies, including initiatives like 'Make in India,' increased infrastructure investment, and improved foreign direct investment (FDI) regulations, have provided a significant boost to the PEB market.

While the industry is growing, it also faces challenges. What are the biggest roadblocks from design to final commissioning?

Despite its rapid adoption, the pre-engineered buildings (PEB) sector faces several challenges. One of the primary concerns is the complexity of design and engineering. Since every project is unique, precise customization is required, which can be time-consuming and demanding. Another significant challenge is the volatility of steel

prices, as fluctuations in raw material costs directly impact project budgets and profitability. Additionally, competition from unorganized players poses a threat to the market. Low-cost, non-standardized PEB providers affect the industry's credibility and create inconsistencies in quality. Regulatory hurdles also add to the challenges, as approvals and compliance with local building codes can lead to project delays and increased costs.

load-bearing capacity make them more suitable for niche applications rather than large-scale industrial use.

The presence of unorganized players is a major concern. How does Everest Steel Building Solutions counter this challenge while maintaining industry standards?

At Everest Steel Building Solutions, we have built our reputation on quality, trust, and timely delivery. Our

focusing on innovation, dependability, and customer-centric solutions, we establish a benchmark that unorganized players struggle to match.

Technology is transforming the construction sector. How are innovations like BIM, robotics, and AI influencing PEBs?

Digital transformation plays a crucial role in improving design efficiency, speed, and precision. Building Information Modeling (BIM) enables 3D visualization, reducing errors and optimizing project planning. Automation and robotics further enhance manufacturing accuracy and accelerate the assembly process, ensuring greater consistency and quality. Additionally, the integration of artificial intelligence (AI) and the Internet of Things (IoT) in pre-engineered buildings (PEBs) allows for predictive maintenance, real-time monitoring, and energy optimization. At Everest, we leverage these advanced technologies to enhance efficiency, minimize errors, and deliver projects faster, setting new standards in the industry.

How has Everest Steel Building Solutions capitalized on growth opportunities in the PEB sector over the last three years?

Over the past three years, we have made significant strides in expanding our capabilities and delivering excellence. We have increased our manufacturing capacity to efficiently handle large-scale projects, ensuring seamless execution. Our commitment to precision and timely delivery is evident in the successful completion of over 4,500 projects across India. To further strengthen our expertise, we have built a robust design and engineering team comprising over 150 skilled professionals. Additionally, we have focused on developing next-generation pre-engineered building



Given the volatility in steel prices, should the industry explore alternatives like FRP, aluminum alloys, or composites?

Steel remains the backbone of the PEB industry due to its strength, flexibility, and cost-effectiveness. However, there is growing interest in hybrid structures that combine steel with advanced coatings, FRP (Fiber Reinforced Polymer), and lightweight composites. While these materials offer corrosion resistance and weight reduction, their high cost and limited

commitment to excellence is reflected in our strict adherence to global quality standards and certification compliance. With in-house research and development, along with advanced engineering solutions, we ensure that each design is customized to meet the specific needs of our clients. Our automated manufacturing processes guarantee precision and consistency, setting us apart in the industry. Additionally, our strong after-sales service and long-term partnerships with clients reinforce our reliability. By

(PEB) solutions that align with industry advancements and sustainability goals, reinforcing our leadership in the sector.

Which industries are you focusing on for maximum revenue growth in FY 2024-25?

We see strong demand across several key sectors that are driving growth and innovation. Warehousing and logistics continue to be the backbone of e-commerce and supply chain expansion, creating a need for large, efficient storage solutions. The industrial manufacturing sector is also experiencing a surge, with the rise of smart factories and automated production plants requiring advanced infrastructure. In addition, aviation and defense are emerging as critical areas, with specialized hangars, storage facilities, and military infrastructure in high demand. Infrastructure development, including metro stations, airports, bridges, and urban projects, further contributes to market expansion. Our strategy is to align with India's infrastructure growth and offer solutions that cater to these high-demand sectors, ensuring efficiency, durability, and innovation.

With sustainability becoming a top priority, how is Everest integrating green solutions in PEB projects?

Sustainability is at the core of our innovation, driving us to develop environmentally responsible building solutions. We prioritize the use of recyclable, high-strength steel to reduce waste and enhance the longevity of our structures. Our solar-ready pre-engineered buildings (PEBs) are designed to support renewable energy integration, promoting clean energy adoption. In addition, we incorporate rainwater harvesting systems and advanced insulation technologies to improve energy efficiency and reduce resource consumption. Our optimized fabrication methods further minimize

waste during production, ensuring a more sustainable manufacturing process. By integrating these green building practices, we ensure that our projects meet both regulatory and environmental standards, contributing to a more sustainable future.

What policy reforms could further boost the PEB sector?

To accelerate the adoption of pre-engineered buildings (PEBs), key policy reforms are essential. Faster approval processes for pre-engineered structures would help streamline execution and

government support, will be instrumental in driving the industry forward and fostering long-term growth.

Finally, what are Everest's expansion plans for the next three years?

Our vision is to strengthen our market leadership by expanding our manufacturing capabilities to meet the growing demand for pre-engineered buildings (PEBs). As part of our growth strategy, we are increasing our regional footprint by establishing more sales offices across India, ensuring better accessibility and service for our clients.



reduce project delays. Providing incentives for green buildings and sustainable construction would further encourage environmentally friendly practices in the industry. Additionally, the standardization of PEB design codes is crucial to ensure uniformity and maintain high-quality standards across projects. Stricter regulations on substandard construction practices by unorganized players would help improve market credibility and safety. A stronger regulatory framework, coupled with

We are also focusing on high-growth sectors such as data centers, defense infrastructure, and mega industrial projects, which require advanced and reliable building solutions. Additionally, our continued investment in research and development enables us to pioneer cutting-edge PEB solutions with smart technology integration. With our commitment to innovation, quality, and timely delivery, we aim to redefine the future of PEBs in India, setting new industry benchmarks.

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The next frontier for India's housing needs

Modular and prefabricated construction



India's rapid urbanisation demands scalable, sustainable housing solutions. Traditional construction struggles with inefficiencies, while modular and prefabricated methods, powered by digital technologies like BIM and Digital Twins, offer faster, cost-effective alternatives. This article explores how digital innovation, automation, and policy support can drive the adoption of modular construction in India, addressing housing challenges while enhancing efficiency, sustainability, and affordability

India's rapid urbanisation, coupled with a projected influx of 275 million people into cities by 2030, has intensified the demand for scalable, sustainable, and affordable housing solutions. Traditional construction methods, hindered by inefficiencies, labour shortages, and environmental concerns, are increasingly inadequate to meet this challenge. Modular and prefabricated construction - a paradigm shift toward factory-manufactured components assembled on-site - has emerged as a transformative approach to address these systemic gaps. Supported by advanced digital tools and aligned with national housing initiatives, this method presents a viable pathway to reshape India's urban infrastructure.

India's construction sector, poised to become the world's third largest by 2025, faces unprecedented pressure to deliver 25 million affordable housing units by 2030 under initiatives like the Pradhan Mantri Awas Yojana (PMAY). Conventional techniques, which account for 35-40% of global carbon emissions and suffer from 20-

30% material wastage, struggle with timelines and cost predictability. In contrast, prefabricated systems reduce construction timelines by approximately 50% through parallelised workflows - simultaneous site preparation and module fabrication - while improving quality control and resource efficiency.

Trimble, a global leader in construction technology, is driving this shift by integrating Building Information Modeling (BIM), automation, and cloud-based collaboration tools into modular construction workflows. Trimble's Tekla Structures enables engineers and architects to create highly detailed 3D models, ensuring seamless coordination between design and fabrication. This technology enhances precision, reduces errors, and facilitates efficient on-site assembly. For instance, BIM-driven projects report a 15-20% reduction in material costs through optimised resource allocation.

The adoption of Digital Twins - virtual replicas of physical structures - further enhances project outcomes. By simulating construction scenarios,



identifying potential bottlenecks, and optimising designs before execution, developers can mitigate risks and improve project outcomes. Trimble's Digital Twin solutions are already being used in large-scale infrastructure and residential projects, setting new standards for accuracy and efficiency.

Trimble Connect, a cloud-based collaboration tool, facilitates real-time data sharing across stakeholders, reducing decision-making delays by 30% in pilot projects. Such tools are critical for scaling modular construction, particularly in high-density urban developments.

Sustainability is another major advantage. The construction industry is one of the largest contributors to carbon emissions, and prefab methods help reduce waste, optimise resource utilisation, and enhance energy efficiency. By leveraging Trimble's advanced automation solutions, developers can ensure minimal material wastage, lower transportation costs, and a reduced carbon footprint. Additionally, mass production of standardised modules cuts per-unit costs by 10-15%, making PMAY targets financially feasible. A 2024 study by NITI Aayog estimated that modular methods could save ₹1.2 trillion annually in construction-related delays and overruns¹.

To fully realise the potential of modular construction, India needs stronger policy support, investment in advanced manufacturing facilities, and streamlined regulatory approvals. Establishing

dedicated industrial parks for prefabrication and encouraging public-private partnerships can help scale production and adoption. Additionally, financial incentives and subsidies for developers adopting prefab technology could accelerate its integration into mainstream construction practices.

Education and workforce training will also play a vital role in this transition. Upskilling construction professionals in digital construction methodologies, robotics, and BIM technologies can ensure a skilled workforce capable of handling advanced prefab techniques efficiently. Increased awareness and case studies showcasing successful modular projects can further encourage widespread adoption among developers and stakeholders.

Despite its immense potential, modular and prefabricated construction in India faces challenges, including perceptions of inferior quality, regulatory hurdles, and a fragmented supply chain. However, with the increasing adoption of smart construction technologies and government-backed infrastructure initiatives, the industry is poised for rapid growth.

Modular and prefabricated construction, augmented by digital innovation, offers India a scalable blueprint to address its housing deficit while advancing sustainability goals. Strategic policy reforms, coupled with investments in automation and workforce upskilling, can position this sector as a cornerstone of urban development. As global precedents demonstrate, the transition to industrialised construction is not merely an option but an imperative for India's urban future. As India continues its march toward urban expansion, the construction sector must embrace innovation to meet the country's housing demands efficiently and sustainably. By integrating Trimble's cutting-edge digital solutions, modular and prefabricated construction can revolutionise India's built environment, ensuring faster, greener, and more cost-effective housing solutions for millions. EPCWorld



HARSH PAREEK
Regional Sales Director,
India and SAARC
Trimble Solutions

¹https://www.niti.gov.in/sites/default/files/2025-02/Annual%20Report%202024-25%20English_FINAL_LOW%20RES_0.pdf

AAC Wall Panels Revolutionizing Data Center Construction and Beyond



As India's technological and urban growth surges, the demand for faster, sustainable, and efficient construction solutions is higher than ever. At the forefront of this transformation is Magicrete, India's largest producer of Autoclaved Aerated Concrete (AAC) walling products, which has emerged as a game-changer in the construction industry. Its AAC Wall Panels have quickly become the preferred choice for building well-known data centres and projects of national importance, thanks to their superior performance and adaptability.

Redefining data center construction

Data centers are vital to the digital backbone of the country, and their construction demands unmatched precision, speed, and reliability. India's data center industry is experiencing significant growth. As of 2024, India's data center capacity stands at ~950 MW and is projected to more than double by 2026. This requires extensive infrastructure development at a rapid pace, which is not feasible using traditional construction methods. Magicrete's AAC Wall Panels have proven to be the perfect fit for these requirements as they allow 16-time faster construction than clay bricks.

Among their key clients is STT, a leading data center developer, which chose Magicrete AAC Wall Panels for its Pune DC-04 and DC-05 facilities. At STT Pune DC-04, Magicrete replaced traditional 200 mm solid concrete blocks with 150 mm AAC Wall Panels for both internal and external walls, covering over 50,000 square feet of construction area. The result? A significant

reduction in construction timelines, along with improved structural flexibility, exceptional thermal insulation and fire rating. These panels, standing up to 5.4 meters tall, were also used in external walls, shaft areas, and terrace walls, showcasing their versatility in high-demand applications.

Sourabh Bansal, Managing Director, Magicrete, emphasised, "As India rapidly expands its digital infrastructure, data centers are becoming the backbone of technological growth. At Magicrete, we take pride in enabling this transformation with our AAC Wall Panels, which offer unmatched speed and efficiency in construction. Our collaboration with leading data center developers like STT is a testament to our commitment to delivering innovative solutions that redefine industry benchmarks."

Features that set Magicrete AAC Wall Panels apart

Magicrete AAC Wall Panels bring a host of advantages to the table, making them a superior alternative to traditional construction materials like clay bricks and concrete blocks:

Strength and lightweight design: Reinforced with corrosion-protected steel, these panels balance lightweight construction with heavy-duty performance.

Thermal insulation: Boasting an industry-leading thermal insulation with K-value of 0.16 W/(m.K), the panels reduce electricity consumption by up to 30% by reducing HVAC load, thereby maintaining cooler interiors.

Acoustic insulation: With an STC rating of 44 dB, these panels dampen external noise, creating



quieter and more comfortable environments.

Fire resistance: Prioritize safety with over 4 hours of fire rating, ensuring robust protection.

Faster installation: Pre-fabricated to full floor-to-ceiling lengths and available in multiple thickness options, these panels significantly cut down construction time by up to 4 times in comparison to blocks.

Sustainability: Being lightweight, they consume lesser raw material, contributing to environmentally conscious building practices.

Adoption beyond data centers

While data centers continue to be a stronghold for Magicrete AAC Wall Panels, their applications extend far beyond, playing a crucial role in various high-profile infrastructure projects of national significance. These panels have been widely used in educational institutions like Euro School in Bangalore and Adarsh Vidyalaya in Mumbai, as well as in high-tech facilities such as STT Data Centre, TCS Pune, and CapitaLand.

In the residential sector, they have been a preferred choice for prominent developments including DLF Gurgaon, Lodha Towers in Mumbai, Mahindra Happinest, Vilas Javdekar Group, Swaminarayan City, and Sigma Realty. Their versatility extends to industrial and infrastructure projects like India Potash, Sugar Mill, Hindustan Platinum, Global Warehouse, L&T, Avior Merlin, and Foxconn Chennai.

Additionally, they have been employed in key hospitality projects, such as Taj Sats at Mopa Airport, further demonstrating their adaptability and efficiency across diverse construction needs.

Looking ahead

Staying true to its mission—"to help people build their homes better, faster, and cheaper using innovative construction technologies"—Magicrete's AAC Wall Panels are set to drive the next big shift in how walls are built. With their proven performance and adaptability, Magicrete AAC Wall Panels are poised to lead the future of construction in India. Their growing adoption by data centers, builders, and nationally significant projects underscores their importance in shaping a more sustainable and efficient urban landscape. As



the construction industry continues to evolve, Magicrete AAC Wall Panels will remain at the forefront, enabling faster, smarter, and greener building solutions.

EPC World



SOURABH BANSAL
*Co-founder and
Managing Director*
Magicrete

Merger & Acquisition frenzy to price hike

Cement sector has to shift strategy for stability

Given India's demand potential, which emanates from increasing infrastructure projects, urbanisation, and housing demands, many leading players in the cement industry are geared up to enhance their production capacities and operational efficiencies to meet the growing requirements. Large-mid players aim to increase their capacities by 50%- 200% by 2030 through organic and inorganic expansions.

Regional players with modest to moderate-sized capacities have been slower in capacity additions. Constrained by relatively smaller balance sheet size, the pace of growth for regional players significantly lags that of the industry's market leaders. Certain regional players, as well as indebted cement players, had to put up their cement assets on sale. This was also partly driven by the lower market valuation of these players compared to the relatively better valuation offered by acquirers.

Hence, the sector has consolidated, with large cement makers taking over regional heavyweights and struggling companies directly or through competitive bidding under the Insolvency and Bankruptcy Code. In the past, there has been stress on a few players, particularly in the small-mid-sized space, where the capex plans of such companies coincided with weaker pricing and profitability periods, or they were marred by higher costs, leading to deteriorated credit profiles and pushing them to exit or sell their respective businesses to the large players.



Indeed, while most of the stressed assets have been acquired over the past few years, consolidation was accelerated. Other relatively weak mid-size and small assets were the focus in the last 18 months. Out of all the markets, as expected, the southern market saw a massive rise in M&A.

The Indian cement industry achieved a decadal high in organic capacity addition during FY24, with nearly 45 million tonnes of new capacity, bringing India's total installed capacity to 641 million tonnes as of March 31, 2024. This is against an average of 25-30 million tonnes of average annual capacity addition over the last decade. Looking ahead, an additional 90-100 million tonnes are expected over the next two years, with approximately 65-70% of this increase driven by the top four players.

Moreover, the industry's trend toward consolidation has intensified. The increase in mergers and acquisitions activity is evident, with around 21 deals since April 2014 involving almost 196 million tonnes of capacity changing hands. Notably, nearly 130 million tonnes of capacity has changed hands in the last 18 months, underscoring the growing consolidation trend in the cement sector. These developments signal a more concentrated market where more prominent players have strengthened their positions.

The largest four cement companies had a consolidated market share of 35% (capacity-wise) in FY12, which has strengthened to 50% in FY24 and is likely to be around 60-65% by FY26.



Consequently, their share in demand is also expected to go up from the current 59% to over 65-68% in the said period. 40% of this capacity share gains for the top four till FY24 came from M&A and inorganic expansion, primarily of distressed assets. Inversely, the capacity market share of moderate-sized cement players, i.e. between the 5th largest and 25th most extensive, reduced from 46% in FY12 to 39% in FY24. The rest of the cement players' capacity market share dipped from 19% in FY12 to 11% in FY24.

Post-FY25E Pause: Anticipating demand growth to rebound

Despite several challenges over the past decade, including demonetisation, the implementation of the Goods and Services Tax (GST), and disruptions caused by the Covid-19 pandemic, cement demand in India has still grown at a steady pace of approximately 6% CAGR. This resilience demonstrates the market's underlying strength and cement's essential nature in the country's economic and infrastructural development.

However, in FY25, particularly in the first half of the year, demand has weakened due to factors like the general elections, a severe heat wave, and delays in infrastructure spending. These disruptions have temporarily slowed growth, reflecting cement demand's sensitivity to political and environmental factors.

Looking forward, over the next few years, demand is expected to be driven by government

spending on low-cost housing, an increased push for infrastructure development, a more favourable outlook for urban housing, stable demand in rural housing, and the revival of the real estate sector. These factors should provide the necessary momentum for growth.

As a result, demand is projected to grow at a robust 6-7% CAGR from FY25 to FY27. This reflects an optimistic long-term outlook for the cement industry, supported by both public and private sector initiatives aimed at boosting construction activity and improving housing and infrastructure across the country.

Pricing: Need of the hour

The Indian cement industry faces intense competition, which places significant pressure on pricing. The struggle for market share and companies' efforts to secure favourable mergers and acquisitions (M&A) deals have kept prices in check. This competitive environment, while driving capacity expansion and consolidation, has also resulted in thinner margins for many industry players.

Consequently, the industry's profitability has suffered, with prices hitting multi-quarter lows in Q2FY25. The pressure on pricing amid heightened competition means that companies find it increasingly challenging to maintain or enhance profitability, even as they expand their operations and market presence. While consolidation and capacity expansion are long-term strategies for growth, short-term pressures from the competitive landscape and cost management adversely affect financial performance.

This scenario underscores the delicate balance that cement companies must achieve between increasing their market share through capacity additions, pursuing strategic mergers, and sustaining profitability amidst aggressive pricing competition.

A key challenge for larger players is that the assets they acquire typically take 1-2 years to ramp up and achieve optimal utilisation levels. During this period, the added capacity may not fully contribute to overall profitability, further affecting the pricing dynamics. This also makes it harder for companies to pass on cost increases to consumers in the short term.

Historically, cement has been one of India's more disciplined cyclical industries. After multiple attempts, the industry achieved a price hike in December 2024. This price increase signals the beginning of a potential recovery, especially as industry players are likely to push for more sustainable pricing levels in the coming quarters.

However, cement prices are still significantly lower, with 9MFY25 prices down by ~5-6% YoY. Several factors, including utilisation levels, the cost curve, and the need for industry discipline, drive the price drop across regions. In recent months, the intense competition, aggressive market share strategies, and M&A negotiations have depressed prices. As the industry consolidates and demand recovers, the pricing outlook is expected to improve, but it will likely be gradual.



India's cement industry's profitability, as reflected in the average EBITDA margin of 16-17% (or EBITDA/tonne of INR 800-900) for FY25E, is currently insufficient to generate adequate returns, especially for brownfield expansions, at the prevailing utilisation levels. This suggests that, under the current conditions, cement companies are facing a challenge in achieving minimum acceptable returns on their investments.

For the industry to generate returns that are in line with the Weighted Average Cost of Capital (WACC)—which is the minimum return required to justify investments—the companies will likely need to implement a further price hike of 6-7%, even for brownfield expansions, and a 12-15% price rise to justify the greenfield expansions. The current pricing environment is too low to cover the required

returns, and a price increase would be necessary to make such expansions financially viable.

An additional factor contributing to the challenge sometime down the road will be the increased cost of acquiring limestone mine ownership. The enactment of the Mines and Minerals (Development and Regulation) (MMDR) Act of 2015 has significantly altered the landscape for mining rights. Previously, state governments could allot limestone mines, but under the new Act, they must now be acquired through a competitive auction process. This change has led to a substantial increase in the royalty per tonne for limestone from state-allotted mines to auctioned ones, with the royalty rate higher by ₹200-250 per tonne.

The higher royalty and the auctioning process for limestone mining rights significantly raise the capital expenditure required to enter the sector, making it much harder for new entrants to achieve even the minimum required returns on their investments. As a result, the industry is likely to see continued consolidation over the long term, with established and large players benefiting from these entry barriers and further strengthening their positions in the market. By improving cost structures and reducing exposure to volatile input costs and carbon emissions, companies are better positioned for long-term stability, especially given the tightening regulations around sustainability.

The need for price increases is also crucial in this context. With rising input costs, increased regulatory compliance costs (especially around carbon emissions), and the ongoing need to invest in green technologies, maintaining margins and ensuring healthy financial performance is a tricky balancing act. Price hikes allow companies to keep up with these rising costs while still delivering returns and maintaining a healthy balance sheet.

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RAVLEEN SETHI
Director
CareEdge Ratings



YASH GUPTA
Assistant Director
CareEdge Ratings



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+91 11-45680111
+91 9560480400

info@imapc.in
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A-51B, G. FLOOR HAUZ KHAS
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