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Reimagining India's Manufacturing Growth

Resilience
Innovation
Sustainability

Foreword

Avijit Mitra

Chairman
ASSOCHAM Manufacturing Sub Council – East

India finds itself at a pivotal stage in its manufacturing evolution. As the global manufacturing landscape experiences significant changes influenced by technology, sustainability, and altering supply chains, India's manufacturing sector has become a vital engine for national growth and international competitiveness.

At ASSOCHAM, we are convinced that the transformation of India's manufacturing sector goes beyond merely increasing industrial output—it involves cultivating a competitiveness, innovation, and sustainability-driven ecosystem. This report, created in collaboration with Primus Partners, explores the opportunities and obstacles that will influence this upcoming growth stage. It emphasizes the necessity of synchronizing policy, technology, and talent to position India as a global frontrunner in advanced and responsible manufacturing.

The study highlights that our advancement should be anchored in three strategic areas: enhancing competitiveness through infrastructure and policy integration, fostering innovation and research-driven industrial progress, and creating a future-ready, skilled labour force.

The Manufacturing Mission and Production-Linked Incentive initiatives have already laid a strong foundation for investment and capacity expansion. The subsequent leap will rely on how proficiently India can embed sustainability and digitalization into its manufacturing essence while enabling MSMEs to evolve into global "Little Giants."

As India redefines its position in the global manufacturing arena, this report acts as both a testament to the nation's achievements and a guideline for the coming decade. It advocates for joint efforts between government, industry, academia, and investors to forge a future where Indian manufacturing symbolizes resilience, innovation, and environmental stewardship. We hope this report significantly contributes to the discussions within the policy and industry spheres regarding the acceleration of India's manufacturing growth narrative. ASSOCHAM remains dedicated to collaborating with all stakeholders to fulfill the vision of "Make in India for the World."

Foreword

Devroop Dhar

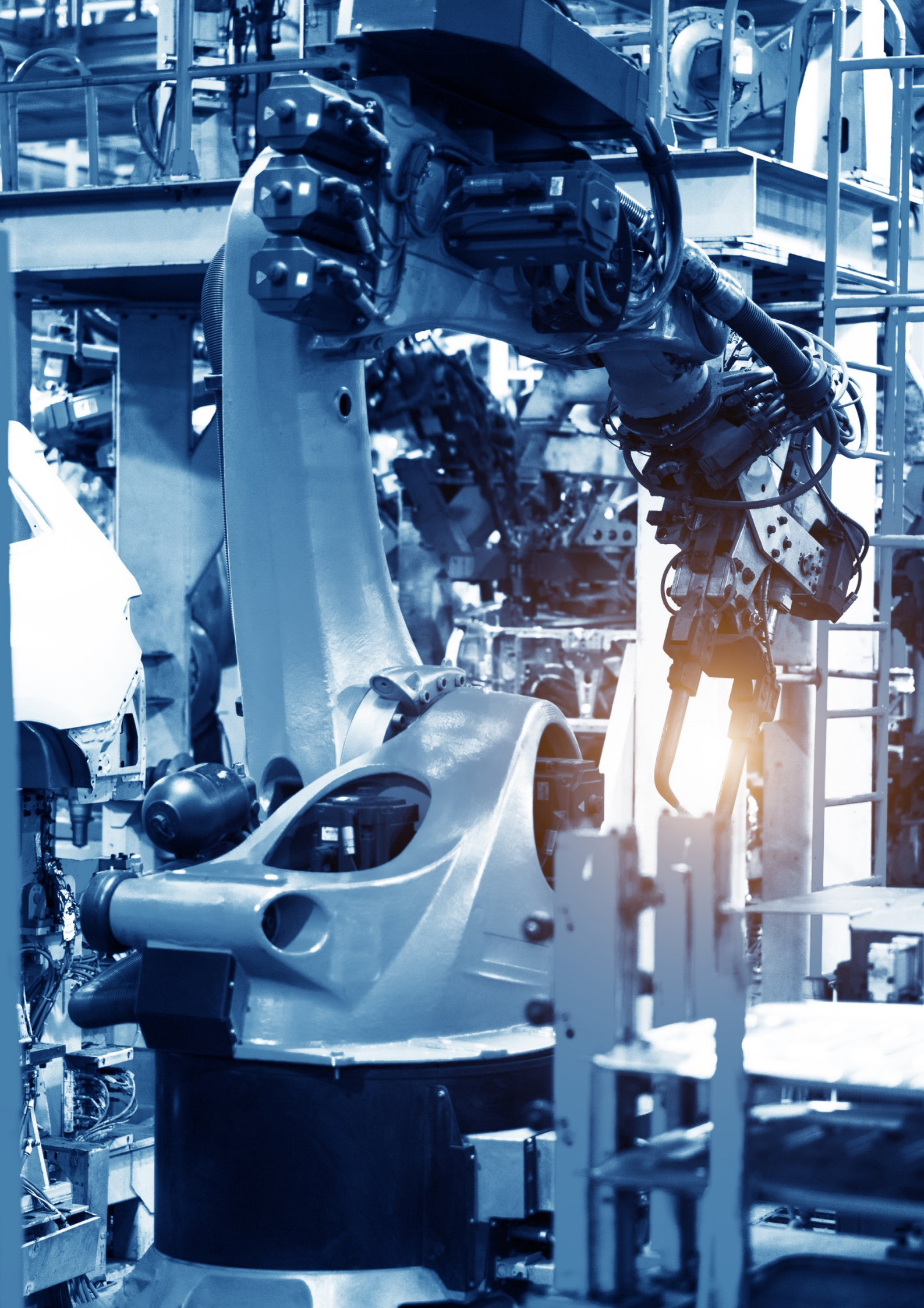
Co-founder & CEO
Primus Partners India

Every few decades, an economy arrives at a point where enterprise, technology, and policy begin to move in rhythm. For India, that moment is now. The manufacturing sector which was once defined by scale and labour is now being reshaped by data, design, and digital intelligence. What we are witnessing is not merely industrial expansion, but the quiet evolution of how India makes, moves, and competes in the world.

Our aspiration for a $1 trillion manufacturing economy is bold, but achievable. Provided we channel our efforts toward productivity, innovation, and resilience. The Government's focus through Make in India 2.0, PLI schemes, Gati Shakti, and the upcoming National Manufacturing Mission 2025 reflects a clear intent to not only attract investment but to strengthen the value chains that sustain it.

This report seeks to decode that opportunity. It captures the emerging shifts in global manufacturing, identifies India's key growth drivers, and outlines actionable pathways for both government and industry to accelerate transformation. The rise of India's high-performing, innovation-driven MSMEs will be central to this story of shared prosperity.

At Primus Partners, we are happy to collaborate with ASSOCHAM in driving this vision forward. Together, we hope to spark a dialogue that is not only about policies and production, but about people, about building a manufacturing ecosystem that creates quality jobs, inspires innovation, and strengthens India's position as a global industrial leader.



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01 Executive Summary

Global manufacturing is undergoing one of its most consequential shifts driven by three converging forces: geopolitical realignment, technological acceleration, and sustainability imperatives. Supply chains are diversifying away from over-dependence on a single geography, while Industry 4.0 tools, from IoT to AI-driven predictive analytics, are redefining efficiency, quality, and resilience.

In this rapidly changing context, India stands at an inflection point. With a strong domestic market, a large and youthful workforce, improving infrastructure, and a policy push anchored in Make in India, Gati Shakti, PLI, and the National Manufacturing Mission 2025 (NMM 2025), the country is poised to become a leading global manufacturing hub.

The challenge, however, lies in execution and ecosystem depth — transforming policy intent into integrated, on-ground impact. The next few years will be decisive. If India can align infrastructure, finance, technology, and skills at scale, it can confidently march towards its US$1 trillion manufacturing goal, and more importantly, position itself as a resilient, green, and innovation-led manufacturing power.

1.1 Key Takeaways

- **Global manufacturing is being rebalanced:**

The post-pandemic realignment has ushered in the China+1 and China+n strategies, regional production blocs, and nearshoring trends. Vietnam, Mexico, and Poland have emerged as major beneficiaries. India, with its low-cost advantage, strategic geography, and large internal market, is well placed to capture this shift, but must strengthen last-mile logistics and technology adoption.

- **Technology and sustainability are becoming the new competitiveness drivers:**

Industry 4.0 is no longer optional. Over 40% of global factories are now partially digitized, with leaders seeing up to 25% gains in operational efficiency and 30–40% reduction in downtime. India must scale its technology adoption curve and leverage digital twin simulation, smart robotics, and green manufacturing.

- **MSMEs are India's manufacturing backbone — and its biggest opportunity:**

MSMEs contribute nearly 30% of GVA and 46% of exports, but most remain small, informal, and capital-constrained. India needs a "Little Giants" approach by identifying 80,000–100,000 high-potential MSMEs and supporting them with credit access, digital tools, quality certification, and market linkages. Without this layer scaling up, India's manufacturing ambition will lack the foundation it needs.

- **India's policy architecture is robust but must now deliver executional depth:**

Gati Shakti, PLI, National Logistics Policy, PM MITRA parks, and the Green Hydrogen Mission provide a strong scaffolding. However, impact depends on synchronizing these initiatives at the corridor level, ensuring inter-agency coordination, and enabling plug-and-play infrastructure.

1.2 Recommendations & Way Forward

◉ **Accelerate corridor-based industrialization:**

Integrate Gati Shakti and NMM 2025 through 10–15 Manufacturing Corridors that align ports, freight networks, and industrial parks. Empowering these corridors with unified governance, single-window clearance, and outcome-based monitoring can reduce lead times and transaction costs by up to 25%.

◉ **Deepen MSME participation, upgrade value chains, and nurture "Little Giants":**

MSMEs contribute nearly 30% to India's GDP but only a fraction to high-value exports. The next phase of manufacturing growth depends on their ability to scale, digitize, and integrate into global supply chains. To enable this, a Cluster Modernization and Competitiveness Fund can be established to co-finance technology upgradation, process automation, testing labs, and shared R&D infrastructure. The "Little Giants" of India will be built by strengthening value chains, improving product sophistication, and raising domestic value addition.

◉ **Enhance access to finance and green capital:**

Establish blended finance windows and ESG-linked credit guarantees to help MSMEs and mid-sized manufacturers invest in energy efficiency, digital tools, and waste reduction. We must encourage adoption of green manufacturing scorecards, providing preferential financing and export incentives to compliant firms.

◉ **Invest in talent and skilling for Industry 4.0:**

It's time that AI/ML, robotics, and data analytics are embedded into ITIs, polytechnics, and engineering curriculum. Dual apprenticeship models and courses co-designed with industries are the need of the hour, especially in sectors that are driving India's next wave of employment such as electronics, automotive, and textiles.

◉ **Strengthen governance and data-driven monitoring:**

The National Manufacturing Mission 2025 should establish a Manufacturing Performance Index (MPI) tracking state-level competitiveness across land readiness, logistics efficiency, and technology adoption. Transparent metrics will help drive accountability, attract investment, and align public-private priorities.

◉ **Position India as a global hub for responsible, sustainable manufacturing:**

We must look at sustainability as a core differentiator, and not a compliance burden. Expand renewable-powered industrial parks, incentivize circular manufacturing, and promote traceability through digital product passports. Such steps can help India capture high-value, ESG-driven supply chains in semiconductors, EVs, and specialty chemicals.

India's manufacturing rise must be earned. The foundations are strong, the intent is clear, and the global window is open. But the real test lies in execution at speed and scale.

02 Global Manufacturing Landscape & Benchmarks

2.1 Global shifts

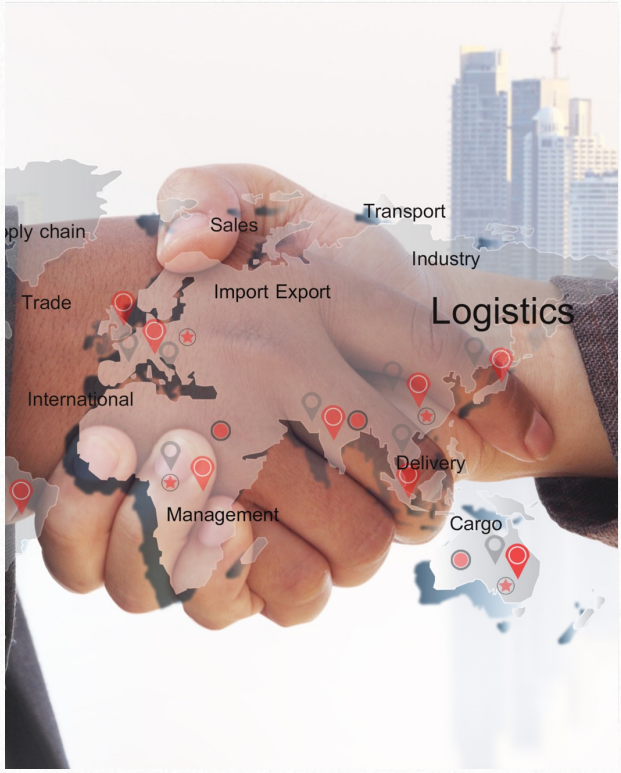
Global manufacturing is being reconfigured by trade disruptions, geopolitics and rising costs. Firms are diversifying production away from a China-only model and regionalizing supply chains.

US tariffs on Chinese imports and supply-chain risks have accelerated this trend: many companies now establish parallel factories in Vietnam, India, Mexico or Eastern Europe. Mexico is a striking case – in 2023 it overtook China as the US's top trading partner for manufactured goods.

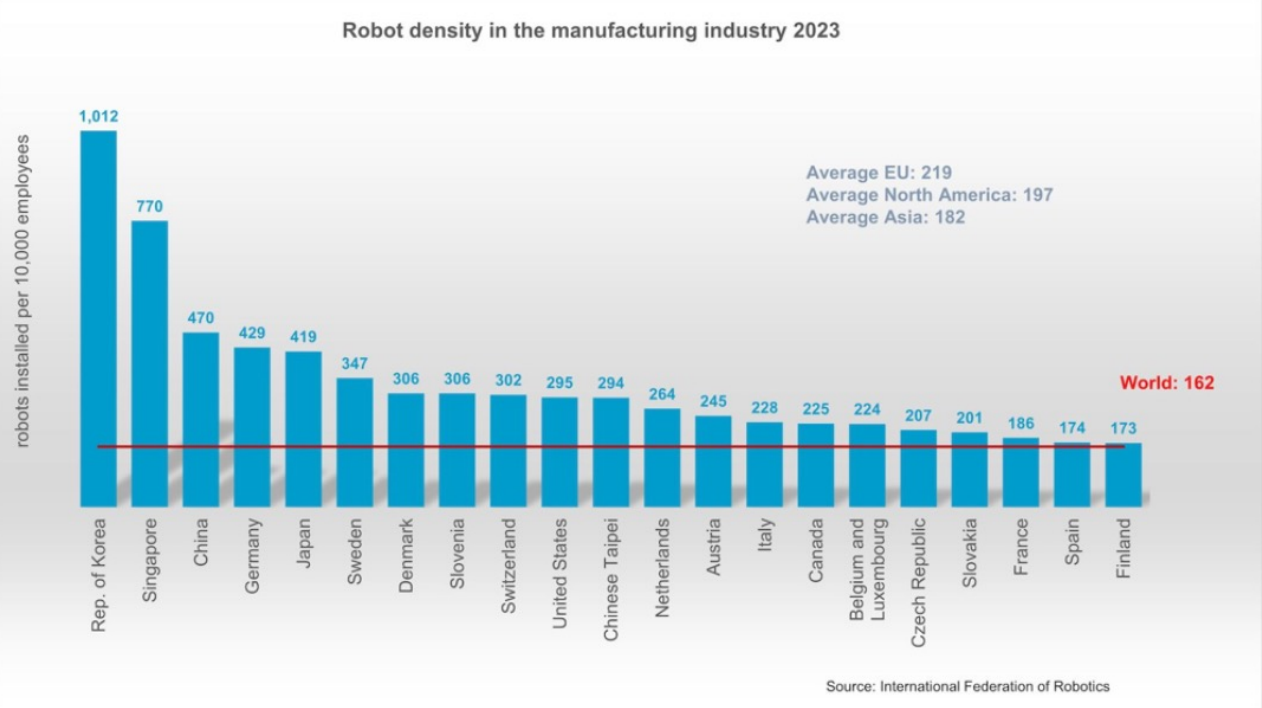
In fact, 57% of US/EU companies surveyed say nearshoring is a key strategy for their supply chains. Political incentives reinforce these moves: for instance, Apple has decided to make most US-bound iPhones in India by 2026 (shifting 80% of those units out of China) to avoid higher tariffs.

In sum, manufacturing is increasingly regionalized and diversified – with North America and Europe incentivizing domestic/nearby production, and Asia's smaller economies (Vietnam, Thailand, etc.) absorbing some China-bound orders. At the same time, global firms are also exploring circular supply chains to cut waste and risks

More than 90% of North American manufacturers report having shifted some production out of China over the past five years.



2.2 Technology and sustainability trends



Automation & AI

Industry 4.0 technologies are rapidly adopted worldwide.

Global robot density in manufacturing reached a record 162 robots per 10,000 workers in 2023 – roughly double the level of 2016.

Leading adopters (South Korea 1,012; Singapore 770; China 470) far exceed the world average, reflecting massive automation. Manufacturers increasingly deploy AI and digital twins for quality inspection, predictive maintenance and optimization: the industrial AI market hit $43.6 billion in 2024 and is forecast to quadruple (23% CAGR) by 2030.

Over 40% of large manufacturers now have CEO-driven AI strategies, focusing on data integration and upskilling. For example, Siemens' smart factory in Amberg (Germany) is highly automated and leverages AI in lean processes, enabling it to make 1,200 different products for 60,000+ customers with minimal defects. IoT connectivity, 5G networks and digital platforms (ERP/CRM integration) are also expanding: a majority of manufacturers already use B2B digital commerce to streamline supply chains and customers.

Sustainability

Decarbonization and circularity are key priorities. Heavy industries are retooling: for instance, the steel sector (7% of global emissions) is pursuing "green steel" via electric-arc furnaces, hydrogen-based ironmaking and carbon capture.

McKinsey notes thousands of existing steel plants must be overhauled or clustered into new "green-hubs" with low-cost renewables. Across sectors, many manufacturers set net-zero targets and invest in renewables, efficiency, and waste reuse. In consumer goods and packaging, circular supply chains are spreading.

For example, India's Recykal platform connects manufacturers to recyclers through a digital marketplace, tracking plastic waste and ensuring it is reused rather than landfilled.

Such initiatives (and policies like Extended Producer Responsibility) show firms blending profitability with sustainability, and seeking a "nothing wasted" model. Overall, the trend is toward smart, green factories, combining robotics/AI with low-carbon power and closed-loop materials.

2.3 Case studies

Vietnam

Manufacturing has driven Vietnam's growth. It now contributes over 20% of GDP and anchors the trade balance. Advantages such as low labour cost, trade agreements, and pro-investor zones attracted FDI in electronics, apparel, and footwear. However, McKinsey reports 2023 challenges: exports fell around 12% YoY in H1 2023, and local value-added remains low. Vietnam is now looking to upgrade skills, productivity and supply-chain linkages to move beyond low-cost assembly. Global companies are nonetheless expanding there: Foxconn alone has invested around $3 billion in Vietnam over two decades and in 2024 announced new EV and telecom component plants there. This confirms Vietnam's role as a rising manufacturing hub, but also underscores the need to diversify.

Germany

Germany exemplifies advanced manufacturing. It remains a global leader in machine tools, automotive, chemicals and advanced electronics. The government's Plattform Industrie 4.0 initiative pushes factories to adopt cyber-physical systems and IoT. Policies like Manufacturing-X (a data-sharing standard across 10 countries) foster open, interoperable production networks. German firms have also upgraded for sustainability: for instance BMW and VW are converting plants for electric vehicles, and Gerdau's rolling mill uses green steel. A signature example is Siemens' Amberg electronics factory, which operates with >75% of processes automated and uses AI to eliminate defects. German industry also highly prioritizes workforce reskilling and lean improvement alongside tech investment.

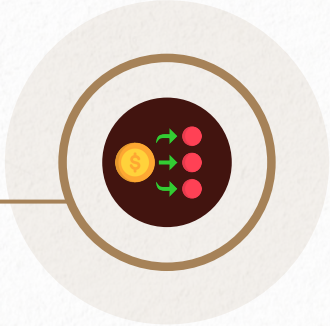
China

China still remains the world's largest manufacturer with around 28% of global output. While domestic demand for consumer goods, EVs, solar panels, etc is fuelling much of it, China's manufacturers are still rapidly upgrading. For example, Chinese robot-makers supplied 60% of all new industrial robots in 2023. In new sectors, Chinese firms dominate: BYD, for instance, built over **3 million electric vehicles in 2023,** outpacing global rivals. China still exports heavily, but not like before: US-bound exports fell 10% in H1 2025, while shipments to ASEAN and India rose 13–14%. This reflects regional trade realignments - Chinese factories now feed neighbouring supply chains as much as global markets.

2.4 Lessons for India

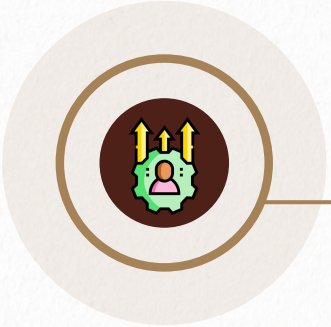
India can learn and adapt from these global trends.

01 Diversification and scale



India should capitalize on its large market and labour force by attracting multinational firms seeking alternatives to China. This requires further improving ease of doing business and reducing input costs (e.g. trimming high import duties on components) so India is seen as competitive (Apple's China-to-India shift illustrates the opportunity but also the current cost gap).

02 Productivity and upskilling



As Vietnam's case shows, low-cost labour is not enough long-term. India must invest in automation and worker training to boost output per employee. Germany's success highlights the value of integrating digital and lean processes. India's own reforms such as PLI schemes, Skill India, etc. are steps in this direction.

03 Sustainability

Indian industry should embrace circular models now. Supporting startups like Recykal or recycling parks (PM MITRA for textiles) can create domestic supply loops and meet both global ESG demand and local waste goals.

04 Building ecosystems

Case studies show that an entire supply chain attracts investment. India could form manufacturing clusters (like auto parks or solar hubs) and invest in infrastructure (reliable power, ports) similar to how China and Vietnam did. Encouraging R&D and higher value-add within India will also help capture more of the value chain – Vietnam's challenge of flat value-capture suggests India should promote engineering and component sectors alongside assembly.

By adopting these learnings on diversification, technology adoption, skills, and green practices, India can strengthen its role in the evolving global manufacturing landscape.

03 India's Manufacturing Outlook & Growth Drivers

3.1 $1T Manufacturing Potential & Growth Momentum

India's manufacturing sector has seen sustained growth and is now being aimed to reach $1 trillion by FY26. Current data show manufacturing contributes roughly 16–17% of GDP, and has nearly doubled its output (GVA grew from INR 15.6 lakh cr. in 2013–14 to INR 28.25 lakh cr in 2023–24). The government's immediate goal by FY 26 is to raise this share toward 25% of GDP.

Recent monthly indicators also reflect this momentum: manufacturing growth was up 5.4% (YoY) in July 2025, and in practice, key industries are driving the push: for example, electronics production has grown six-fold over the past decade.

Scaling to the **$1T target** will require sustaining these trends via domestic demand, rising exports of goods like automobiles and pharma, and continued investment in capacity building.

3.2 Policy Drivers

India has launched an array of policy reforms to support manufacturing growth which include:

Production-Linked Incentives (PLI) Schemes:

Major PLI programs cover 14 sectors (electronics, pharma, autos, textiles, drones, etc.). As of March 2025, PLI commitments have attracted INR 1.76 lakh cr. in investments and generated production/sales exceeding INR 16.5 lakh cr. Over 12 lakh jobs have been created and INR 21,534 cr. in incentives disbursed. By incentivizing domestic production and technology upgrades, PLI schemes are a primary engine pushing output toward $1T.

Ease of Doing Business & Investment Climate:

Successive reforms (e.g. GST tax reform, corporate tax cuts, decriminalization of compliance) have streamlined operations. India's global Ease of Doing Business rank improved dramatically (from 142nd in 2014 to 63rd in 2019). A new National Single Window System (NSWS) now brings approvals across 32 Central and 29 State departments onto one portal, expediting clearances. These changes have helped manufacturing FDI surge: FDI into manufacturing since 2014 reached ~$165 billion.

Infrastructure & Logistics (PM Gati Shakti & Reforms):

The PM Gati Shakti National Master Plan (launched 2021) uses integrated GIS-based planning to coordinate roads, rail, ports, and other infrastructure. This multimodal approach is cutting logistics costs and bottlenecks. Complementary reforms such as the National Logistics Policy (2022) aim to reduce India's logistics costs from ~13–14% of GDP today to single digits by 2030. Several new industrial corridors and expressway projects are under development, improving connectivity between factories and ports.

National Manufacturing Mission (NMM) 2025:

Announced in the 2025–26 Budget, NMM has a INR100 cr. seed outlay. It provides a "roadmap" for industry and amplifies Make-in-India, focusing on **five pillars:**

01 EASE OF DOING BUSINESS

FUTURE-READY WORKFORCE 02

03 VIBRANT MSMES

ACCESS TO TECHNOLOGY 04

05 QUALITY MANUFACTURING

The Mission also emphasizes clean-tech (solar cells, EV batteries, wind turbines, etc.). In tandem, state governments are aligning (e.g. Tamil Nadu's semiconductor and EV policies, Gujarat's PLI co-incentives, etc.), but the centerpiece remains Union-led schemes supporting investment, skills, and innovation.

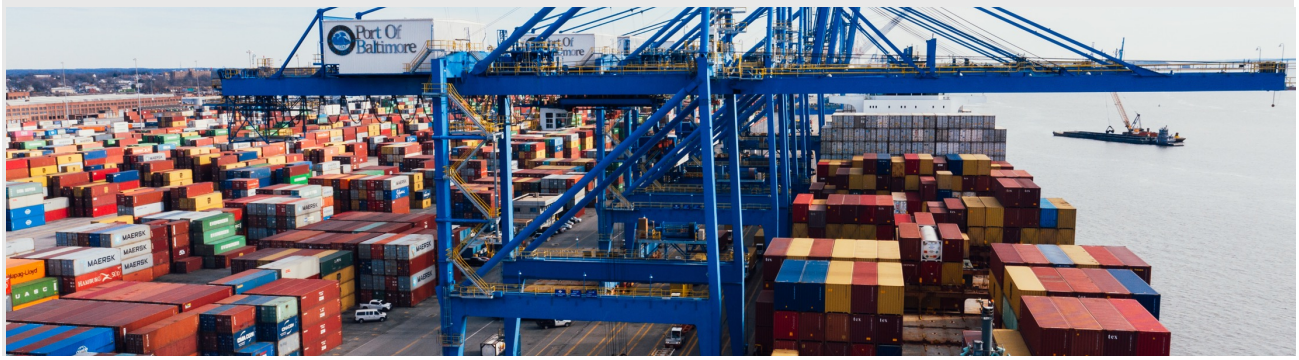
3.3 MSMEs as Industrial Backbone

Micro, Small and Medium Enterprises (MSMEs) form the backbone of India's manufacturing ecosystem. Their role is growing: currently there are about 5.9 crore registered MSMEs employing over 25 crore people. MSMEs account for roughly 30% of India's GVA and nearly 46% of merchandise exports. In effect, nearly half of India's manufacturing output flows through MSMEs, underscoring their critical role.

- **Export & Domestic Linkages:** MSMEs supply components for large factories and produce end-goods for domestic and global markets alike. Over 1.73 lakh MSMEs exported in FY24, with exports jumping from INR 3.95 lakh cr. in 2020–21 to INR 12.4 lakh cr. in 2024–25. The breadth of MSME clusters, from auto components in Pune to textiles in Tirupur, means they can rapidly scale certain industries if given support.

Other reforms include Make in India-style programs for **defence and space**, **PM-MITRA textile parks**, **semiconductor manufacturing missions**, and an **"electric mobility mission" for EVs**. For instance, a new Drone Policy (2025) offers capital subsidies to boost domestic drone manufacturing. All these reforms are designed to **accelerate capacity building and technology diffusion**, directly pushing India toward its manufacturing ambitions.

- **Government Support for MSMEs:** The 2025–26 Budget raised MSME asset/turnover thresholds to qualify more firms, doubled credit guarantees from INR 5 cr. to INR 10 cr., and introduced targeted support such as special loan schemes for SC/ST entrepreneurs, women entrepreneurs, etc. Credit cards for micro-enterprises and sectoral "focus product" schemes are also new. By easing finance and encouraging technology adoption among MSMEs, these policies aim to tap into their vast potential.



"Little Giants" Scaling Model:

Policymakers and industry experts note India needs many more scale-up success stories among MSMEs. Inspired by China's "Little Giants" scheme, one proposal is to identify and nurture on the order of 1,00,000 MSMEs to grow to INR 100 cr. turnover each. If achieved, this "1 lakh strong" batch of mid-sized manufacturers could add $1 trillion to India's GDP by themselves. Such firms would provide components and technologies globally, making India more competitive in value chains. The government's RAMP scheme, credit reforms and expansion of cluster development programs are partly geared toward enabling exactly this kind of scaling.

In summary, strengthening MSMEs – turning many into higher-productivity "Little Giants" – amplifies job creation and output, anchoring India's industrial base as manufacturing expands.

3.4 Key Gaps & Constraints

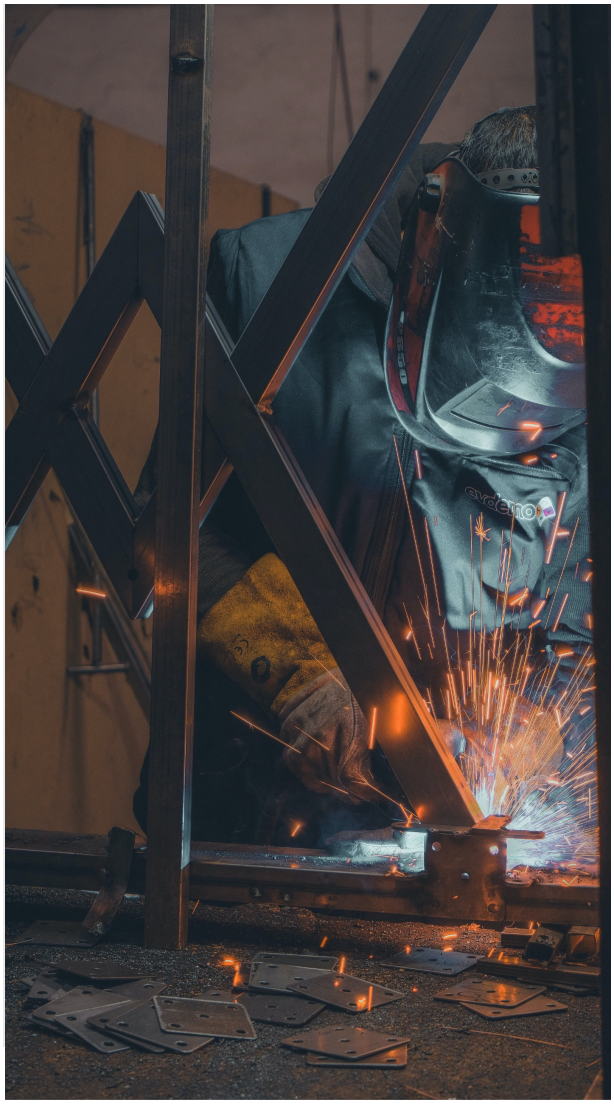
Despite positive trends, several structural gaps still hinder India's manufacturing potential:

- **Supply-Chain Depth & Integration:** India's manufacturing supply chains remain fragmented. Many industries rely on imported inputs or poorly developed domestic vendors. For example, studies note high tariffs on intermediate goods (chemicals, electronics components, etc.) and "poor supply-chain integration", which raises costs. Clustering of related firms remain limited, so factories often face bottlenecks or must import key parts. Although tariffs on inputs have been cut in some cases, further liberalization and the development of integrated industrial parks (with in-house labs or supply bases) are needed. High logistics costs (still around 13–14% of GDP) and infrastructure gaps (power, roads, warehousing) also add friction.

- **R&D and Innovation:** India invests little in R&D by global standards. National R&D spending is only around 0.6–0.7% of GDP (versus 2.4% in China, 3.5% in the US). Private sector R&D is especially low (~0.3% of GDP). This means fewer new technologies and lower product sophistication. In manufacturing, this shows up as limited in-house innovation: for instance, India has only 15 companies among the world's top R&D spenders (vs. 119 in China). The result is that Indian firms often compete on labor cost rather than unique tech. Strengthening R&D (incentivizing private innovation, expanding tech-innovation hubs, promoting university-industry collaboration) remains a crucial gap.

- **Credit Access:** Limited access to affordable finance continues to constrain many manufacturers, especially MSMEs. Even though recent reforms (higher loan caps, expanded guarantee schemes) have helped, credit gaps remain. Many small firms rely on informal or high-cost borrowing. According to one estimate, only a minority of SMEs have any formal credit as of 2023. Without sufficient working capital or investment loans, firms find it hard to upgrade equipment or expand capacity. Continued focus on easing MSME lending (via NBFCs, fintech credit, lower-interest loans) is needed to unlock growth potential.

- **Skilling & Workforce:** Manufacturing often requires specialized skills (machine operation, digital control, quality engineering, AI knowhow). India's workforce suffers from a skills gap. For example, the PLFS survey shows only ~5% of Indian youth have any formal vocational training. Even among existing workers, many lack training in new technologies with over 60% of MSMEs having no employees trained in digital tools. This limits the impact of automation and reduces productivity.



04 West Bengal: Enabling the Eastern Manufacturing Gateway

West Bengal is emerging as a manufacturing powerhouse, supported by its geographic advantages, economic scale, and sectoral diversity. Situated at the confluence of South Asia and Southeast Asia, the state serves as a natural gateway to Bangladesh, Bhutan, Nepal, and the northeastern states of India.

The state's strategic location along with the Bay of Bengal also positions it's a vital node in the India's East policy and Indo-Pacific trade corridors.

According to the budget for 2024-25, West Bengal recorded a Gross State Domestic Product (GSDP) of INR 19.14 trillion (US$ 230 billion) , making it one of the top 5 contributors to India's GDP. This reflects a robust economic trajectory driven by sustained growth in the manufacturing, services, and infrastructure sectors. Additionally, the manufacturing sector is expected to grow by 7.26%, which is significantly higher than the national average of 6.53% indicating a strong industrial renaissance supported by the policy reforms and infrastructure investments in the state.

Merchandise exports from West Bengal reached approximately US$ 7.2 billion by August 2024. This growth is driven by strong performance in sectors such as iron and steel, marine products, chemicals, leather goods, and textiles.

This trend indicates that West Bengal is emerging as a manufacturing and export hub in Eastern India, supported by strategic investments in logistics, industrial clusters, and skill development. The state's industrial policy aims to enhance the ease of doing business by providing single-window clearances and offering sector-specific incentives. Overall, improvements in logistics, cluster development, and supportive policies are contributing to this growth.

The state government's Industrial and Investment Promotion Policy focuses on enhancing the ease of doing business by providing single-window clearances, digitizing the land bank, and offering sector-specific incentives. The Silpa Sathi portal has simplified the approval process for over 100 services, thereby reducing compliance burdens for investors.

Moreover, the West Bengal Logistics Policy 2023 and the Export Promotion Policy 2024 are designed to improve multimodal connectivity and incentivize export-oriented units (EOUs).

West Bengal has also established plug-and-play industrial parks in Kalyani, Panagarh, and Raghunathpur, which provide ready-made infrastructure for industries such as electronics, electric vehicle (EV) components, and food processing. These parks are connected to logistics hubs and skill development centers, ensuring quicker time-to-market and availability of a skilled workforce.

4.1 West Bengal Strategic Strengths

West Bengal possesses key strengths in logistics, industrial clusters, emerging sectors, and talent development, establishing it as a manufacturing and trade gateway for Eastern India and South Asia. The state is well-positioned for accelerated industrial growth. The following are the key areas for the strategic strengths in the state:

Logistics gateways: 01

The logistics sector in West Bengal is experiencing significant growth, the state government granting it Industry Status and implementing strategic infrastructure developments. This progress positions West Bengal as a critical gateway to Northeast India and ASEAN countries. The city benefits from its strategic location, offering seamless, connectivity to major highways, ports and neighbouring states, making it an ideal hub for warehousing and distributing activities and it is expected to attract more investments and offer various tax benefits and incentives to businesses in the sector.

Additionally, the cabinet approved the transfer of 200 acres of land for the proposed Tajpur-Dankuni-Raghunathpur economic corridor, a major project designed to boost industrial growth and employment. This initiative aligns with national projects such as the Amritsar-Kolkata Industrial Corridor (AKIC) and the Eastern Dedicated Freight Corridor (EDFC), which also pass through the state.

The West Bengal Inland Water Transport, Logistics, and Spatial Development Project, supported by the World Bank, has a state contribution of USD 45 million (approximately Rs. 328 crore) and World Bank funding of USD 105 million (approximately Rs. 772 crore). This project aims to enhance passenger and freight movement across the Hooghly River and improve spatial planning to enhance accessibility in the Kolkata Metropolitan Area.

West Bengal is the gateway to the East and plays a crucial role in the transport & logistics network of the country. The state has the 3rd largest road network connectivity in India with 17 National Highways and 2 Asian Highways,16% of National Waterways, 5th largest metro rail network in India with over 100 km extension underway, two large container and bulk handling ports at Kolkata and Haldia, 2nd largest cold storage capacity in the country and largest warehousing capacity in East India. The state has attempted to foray into expansion of all modes of transport infrastructure to make it a multi-modal logistics hub. The robust infrastructure availability and state's strategic location complemented with the Government of West Bengal's end-to-end support, makes Bengal one of the highly sought investment destinations for India.

Ports

- Kolkata Port, officially known as Syama Prasad Mookerjee Port
- the Haldia Dock Complex together handle over 60 million tonnes of cargo each year
- Serves as key maritime gateways for India's eastern and northeastern states, as well as for Bangladesh, Nepal, and Bhutan.
- The Petrapole Land Port, which is India's largest land customs station, facilitates more than 60% of Indo-Bangladesh trade, managing goods valued at over ₹20,000 crore annually.

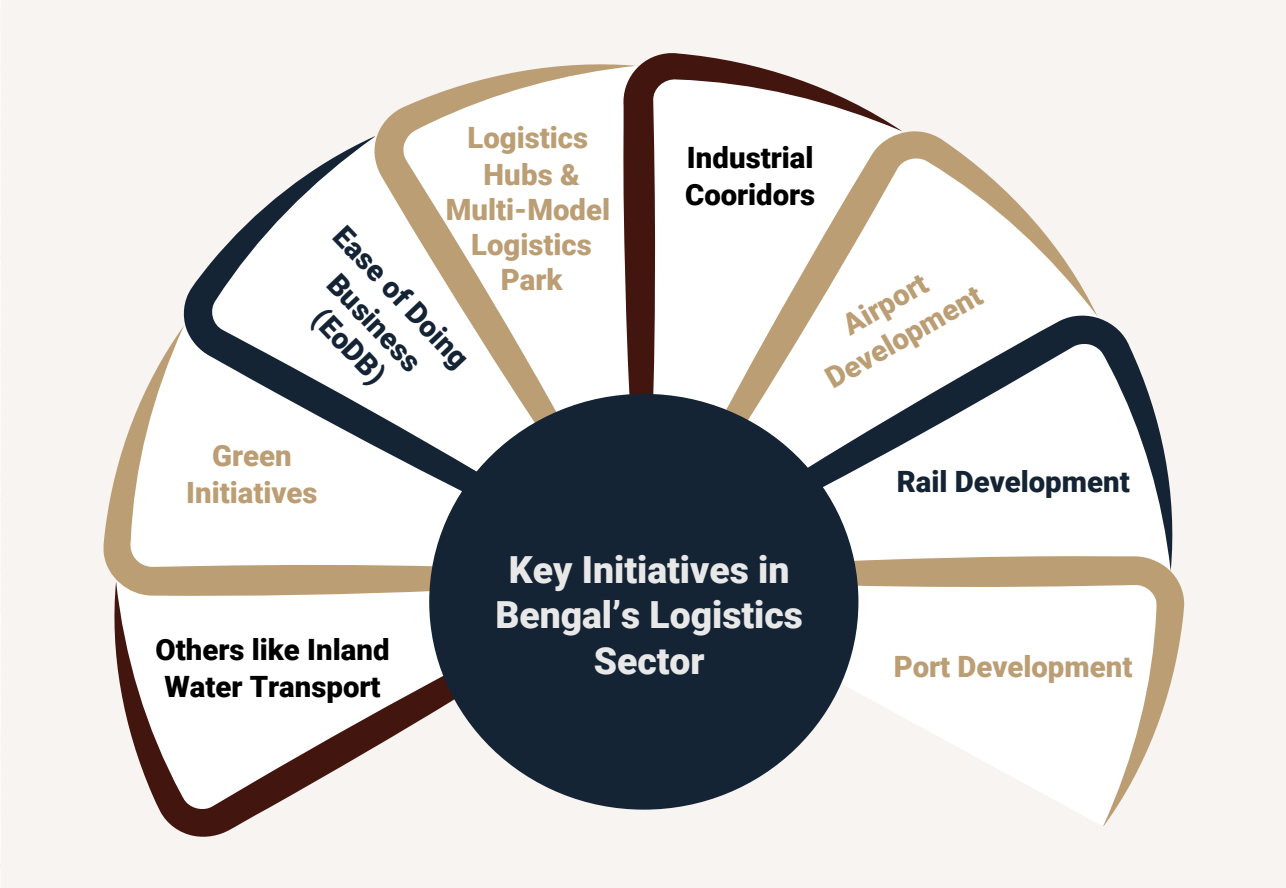
Eastern Dedicated Freight Corridor (EDFC),

- Terminates at Dankuni, improves cargo movement efficiency and connects West Bengal to the industrial centers of North and West India.
- Netaji Subhas Chandra Bose International Airport (NSCBI) in Kolkata accommodates over 20 million passengers and handles 150,000 tonnes of cargo each year, supporting high-value exports such as electronics and perishables..

Inland Water Transport

- National Waterway-1 (Ganga) and National Waterway-2 (Brahmaputra) support inland water transport from Haldia to Allahabad and Guwahati, reducing logistics costs by up to 30% for bulk cargo.

West Bengal Logistics Policy, 2023, is a targeted initiative by the state to develop a comprehensive logistics ecosystem. The state government aims to establish advanced and sustainable logistics infrastructure, improve the ease of doing business, promote the adoption of technology, create a skilled workforce, and position Bengal as the nation's logistics hub. Additionally, the policy seeks to reduce logistics costs in the state by 40% by the end of its implementation period. The key initiatives for the implementation of the policy are as follows:

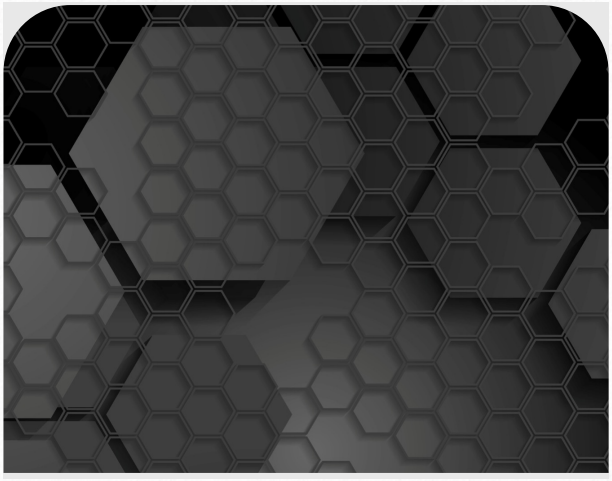


The Government of West Bengal intends to implement the State Logistics Policy through the West Bengal Integrated Logistics Action Plan (WBILAP). The WBILAP consists of 10 interventions designed to strengthen the state's logistics sector comprehensively.

- Developing Multi-Model Logistics Parks
- Boosting Technology Adoption
- Creating Support Infrastructure through freight villages
- Setting Up of West Bengal Logistics Centre of Excellence
- Establishing Dedicated Land Banks
- Promoting Skill Development & Capacity Building
- Improving EoDB & Promoting the private sector through PPP
- Creating Green Logistics
- Integrated Portal of Cold Storage
- Fortifying EXIM Logistics

Industrial clusters: steel/metal, petrochemicals, MSMEs

02



West Bengal has long been recognised for its diverse industrial base, supported by legacy sectors and developed through targeted policies and infrastructure improvements. The state's industrial clusters—especially in steel and metals, petrochemicals, and MSMEs—play a crucial role in generating regional employment, exports, and value addition.

State GDP

US$ 221.37 billion in FY 2023 (6th in India)

Population

91,347,736 (7.55% of total population of India)

Literacy rate

77.1%

Urbanisation Rate

32%

Major industries

Iron & Steel, Heavy & Light Engineering products, Leather & Leather products, Chemicals & Petrochemicals, Textiles, Gems & Jewellery, Food Processing, Hospitality & Tourism, IT and IT enabled services, Automobile and Auto components, Drugs & Pharmaceuticals, Papers, Tea, Jute products, Electrical & Electronics, Infrastructure & Real Estate.

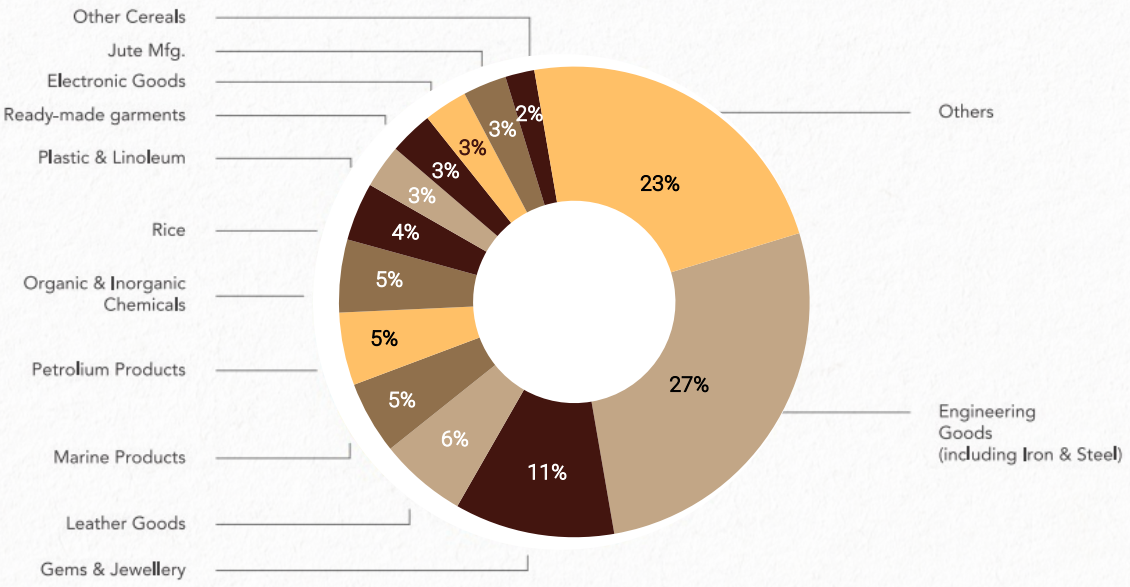
Highlights:
- The capital, Kolkata, ranked 7th city with "highest Employable Talent" in India Skills Report 2023
- West Bengal ranked 11th in India Innovations Index 2021

Source: Ministry of Commerce and Industry

Figure 1: West Bengal's Rank in India's Exports

Source: Ministry of Commerce and Industry

Key exports from West Bengal align with India's priority sectors, including engineering goods, agricultural products, textiles, and gems and jewellery as depicted in figure below:



Source: Ministry of Commerce and Industry

In addition to this growth, Bengal offers a favorable ease of doing business ecosystem that greatly supports the state's export sector. The government has implemented various initiatives to enhance regulatory mechanisms, thereby assisting investors in their business activities and significantly reducing the time required to set up a business. Key initiatives include the State-Level Investment Synergy Committee, Silpa Sathi— a 24/7 digital single-window service for ensuring compliance with statutory requirements, and the Jomir Tothya app, which facilitates the digitization of land records. West Bengal has consistently ranked among the top states in the Ease of Doing Business (EoDB) rankings.

03 Emerging sectors: electronics, EV components, food processing

West Bengal is experiencing significant growth in emerging sectors, including electronics manufacturing, electric mobility, food processing, and technical textiles. This growth is supported by policy incentives, infrastructure development, and a skilled workforce, positioning the state as a competitive industrial hub for the future

ELECTRONIC MANUFACTURING

Promoting sectors through dedicated clusters and incentives:

- **Kalyani Electronic Manufacturing Cluster (EMC) and Naihati EMC.**
- **State's Electronics Policy 2021** offers capital subsidies, interest subvention, and plug-and-play infrastructure.
- **Focus areas include LED lighting, printed circuit boards (PCBs), and IoT devices.**

TECHNICAL TEXTILE

- Aligned with the **National Technical Textiles Mission,** West Bengal is promoting high-performance fabrics for industrial and defense use.
- Focus segments include **geotextiles, medical textiles, and protective wear.**
- The state is supporting **textile parks and testing labs** in Nadia, Howrah, and North 24 Parganas.
- MSMEs are being incentivized to adopt **advanced weaving and coating technologies.**

EELECTRIC VECHICLES (EV)

With a robust electric vehicle ecosystem and the launch of the **"West Bengal Electric Vehicle Policy 2023."**

- **Kalyani and Durgapur** are emerging as hubs for battery manufacturing, motor assembly, and EV component fabrication
- **Policy targets 1 million EVs by 2030,** with incentives for manufacturers, charging infrastructure providers, and fleet operators
- **The state is also promoting EV R&D centers and skill development** programs in collaboration with technical institutes

FOOD PROCESSING & AGRI-TECH

- In **Malda, Murshidabad, and East Medinipur,** clusters are focused on the processing of mangoes, rice, fish, and jute.
- The state provides **Mega Food Parks, cold chain infrastructure, and export facilitation** for processed food products.
- **Agri-tech startups are being encouraged to utilise IoT, AI, and blockchain technology** to enhance traceability and productivity.

AI, ANALYTICS & INDUSTRY 4.0

- Kolkata's IT and analytics ecosystem is enabling digital transformation across manufacturing and services.
- Salt Lake Sector V and Rajarhat host firms in **data analytics, AI, and automation.**
- The state is promoting **Centers of Excellence (CoEs)** in collaboration with IIT Kharagpur and private players.
- Industry 4.0 applications are being piloted in **steel, logistics, and food processing** clusters.

Strengths

- Strategic location near Bangladesh, Bhutan, and Southeast Asia enhances export potential and cross-border trade.- Dedicated industrial clusters in Kalyani, Naihati, Haldia, and Malda support growth in specific sectors.
- A strong talent pool from IIT Kharagpur, Jadavpur University, and MAKAUT promotes innovation and research and development.
- State policies, including the EV Policy 2023 and the Electronics Policy 2021, provide fiscal incentives and infrastructure support.

S

Weakness

- Limited high-tech manufacturing base compared to western and southern states.
- Fragmented MSME ecosystem with uneven access to technology and finance.
- Logistics bottlenecks in hinterland areas despite port and corridor development.
- Low awareness and adoption of Industry 4.0 tools among traditional manufacturers.

W

O

Opportunity

- EV component manufacturing and battery assembly for domestic and export markets.
- Food processing and agri-tech integration with cold chains and smart logistics.
- Technical textiles for defence, medical, and infrastructure applications under the National Technical Textile Mission.
- AI and analytics hubs in Kolkata to support smart manufacturing and predictive maintenance.

T

Threats

- Competition from other states such as Tamil Nadu, Gujarat, and Maharashtra is impacting efforts to attract high-tech investments.
- Global supply chain disruptions are affecting the sourcing of electronics and electric vehicle components.
- Additionally, there are environmental compliance risks within the chemical and textile sectors.
- Furthermore, there is a skills mismatch between industry needs and the available workforce in emerging technologies.

05 Advancing MSME Manufacturing & Supplier Upgrading

Micro, Small, and Medium Enterprises (MSMEs) are the foundation of India's manufacturing economy, contributing nearly 30% to the GDP, 45% to exports, and employing over 111 million people as of FY 2024–25, yet the majority if the firms remain small, fragmented and low on technology adoption. In strategic sectors such as EVs, medical devices and defence, India continues to rely heavily on imported components & sub-system due to the absence of a strong domestic base of specialised, high-quality suppliers. Current MSME support frameworks focus on board credit & procurement benefits but do not create globally competitive championships that can drive innovation, value addition & export strength. To address the gap, we have the following strategies adopted in India & internationally are as follows:

5.1 India's Mittelstand Strategy — SRDI / Little Giants Model

To address this gap, a proposed SRDI (Specialised, Refined, Distinctive, Innovative) Champions initiative draws inspiration from Germany's Mittelstand and China's Little Giants programmes. The model focuses on identifying and nurturing high-potential MSMEs and startups that can become leading suppliers in critical manufacturing value chains.

Further to nurture globally competitive, innovation-driven MSMEs. SRDI 2.0, introduced in 2024, focuses on technology-intensive MSMEs in sectors such as precision engineering, electronics, green mobility, and defence manufacturing.

The SRDI Model

The initiative aims to develop **10,000 "Little Giant" firms** through a phased approach:

Phase 1
1,000 firms across 5 strategic sectors (Pilot)

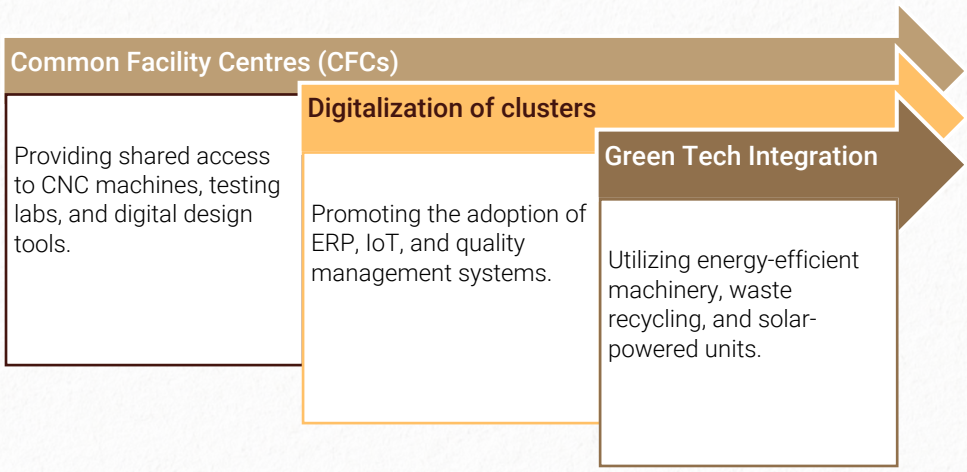
Phase 2
Scale to **5,000** based on impact evaluation

Phase 3
Expand to **10,000** with stable institutional systems

The scheme supports the creation of Intellectual Property (IP), product standardization, and global market access, providing funding of up to INR 5 crore per enterprise. The Little Giants approach, as adapted by NITI Aayog, aims to target 10,000 high-potential MSMEs for scaling up through mentorship, R&D grants, and export facilitation.

5.2 Cluster Modernization through Shared Tech Infrastructure

The Micro & Small Enterprises Cluster Development Programme (MSE-CDP), implemented by the Ministry of MSME and ADB's Enterprise Development Center (EDC) Network, is driving modernization through:



As of 2025, over 1,200 clusters have been mapped across India, with INR 3,000 crore allocated for modernization under MSE-CDP.

5.3 Manufacturing Financing and On-Ground Capability Uplift

Access to affordable finance remains a critical barrier for MSMEs. In FY 2024–25, the following initiatives have been scaled:

Credit Guarantee Scheme for Micro and Small Enterprises (CGTMSE)	Enhanced to ₹5 lakh crore with 85% coverage for greenfield units.
SIDBI's 59-minute loan portal	Disbursed over ₹1.2 lakh crore in working capital and term loans.
Production Linked Incentive (PLI) extensions	MSMEs in electronics, textiles, and food processing are now eligible for PLI-linked capital expenditure support

Additionally, KPMG's MSME Capability Index 2024 highlights that digitally enabled MSMEs report 20–25% higher productivity and 15% lower defect rates.

5.4 Case Examples and Global Benchmarks

India is transforming its Micro, Small, and Medium Enterprises (MSMEs) by drawing inspiration from global benchmarks such as Germany's Mittelstand and China's Little Giants. These models focus on specialization, innovation, and export readiness.

In India, successful cluster initiatives, like the Rajkot Engineering Cluster in Gujarat, have utilized Common Facility Centers (CFCs) to provide access to CNC and CAD/CAM technologies. As a result, this initiative has led to a 30% increase in exports over two years. Similarly, the Kolkata Leather Cluster in Bantala has introduced effluent treatment systems and design laboratories, enabling compliance with EU standards and expanding its global reach.

Germany's Mittelstand significantly contributes to the country's economy, accounting for 52% of GDP and 60% of employment. This success is supported by the Fraunhofer Institutes, which facilitate applied research, development, and market access. In parallel, China's Little Giants program has identified over 10,000 firms, with 70% operating in advanced manufacturing and digital technology. This program creates a scalable model for India's SRDI 2.0 initiative.

These examples underline the importance of targeted infrastructure, innovation support, and global integration in enhancing the manufacturing and supply capabilities of MSMEs. The principles of deep specialization, global integration, and state-supported innovation ecosystems are now central to India's MSME 4.0 roadmap.

India's MSME sector is undergoing a structural transformation driven by cluster-based modernization, targeted financing, and global benchmarking. With ongoing support from central ministries, multilateral agencies, and industry bodies, MSMEs are well-positioned to become the driving force behind India's vision for a $5 trillion economy.

06 Infrastructure & Ease of Doing Manufacturing

India's manufacturing gross domestic product (GDP) is projected to hit around **INR 87.57 lakh crore** (approximately **US$1.1 trillion**) in **FY26**, reflecting a significant growth propelled by advancements in key industries. As of July 2025, the manufacturing sector experienced a year-on-year growth of 5.4%, an increase from 3.7% the previous month, indicating a robust recovery and ongoing momentum.

The services and manufacturing sectors of West Bengal have seen remarkable growth rates during the last decade (from 2013-14 to 2022-23), at 5.0 and 8.1 percent per annum, respectively.

For West Bengal to unlock its full potential for the above-mentioned sectors and emerge as a leading industrial hub in eastern India, a focused thrust on **infrastructure development** and **ease of doing manufacturing** is necessary. Apart from its geographic advantages with respect to the ports and especially as the doorway to ASEAN markets, West Bengal must recalibrate its focus on to developing a modern, efficient, and investor-friendly ecosystem.

As for West Bengal, while it furthers its growth story, it has categorically identified the following sectoral focus areas:

Steel

Five new plants planned in Jangaimahal expected to bring in **32,000 crore.**

Leather

Bengal contributes **50%** of India's **$700 million** leather exports.

Semiconductors & IT

Global Foundries to set up a design and testing hub in Kolkata's Power Centre. Santech Global Inc is also exploring a project. Fabrication facilities could follow.

Medical exports

$20.5 million worth of pharma and medical equipment exported in **2024**

MSMEs

90 lakh units employing **1.3 crore people**. Loans worth **Rs.9.5 lakh crore** sanctioned. Land offered at **Rs.1 for** district malls with SHGs.

Gems & Jewellery

Exports worth **$1.8 billion** in **FY24**

Food processing

Shrimp exports hit **$423 million** in **PY24**

6.1 Industrial Parks & Land Availability – Local Touch, Global Impact

Government Initiatives

The implementation of the National Industrial Corridor Program and the recent introduction of IPRS 3.0 (India's Industrial Park Rating System) are designed to enhance infrastructure competitiveness and draw in foreign direct investment in the manufacturing sector.

Next-Gen Industrial Parks

There is an emphasis on developing sustainable and eco-friendly industrial parks, with India aiming to establish over 200 eco-parks by 2030, to fulfil its commitments to combat climate change and promote clean energy.

Private Sector & FDI Support:

Existing parks are experiencing over 90% capacity utilization, largely due to sectors such as electronics, automobiles, and renewable energy, while new parks being developed in Uttar Pradesh, Odisha, and Telangana are anticipated to stimulate further growth.

Indian Industrial Parks

Gujrat Ports

Dahej and Mundra ports boost port-linked manufacturing exports.

Tamil Nadu Parks

Advanced auto and textile parks support global supply chains

Maharashtra Corridor

Specialized industrial zones support pharmaceuticals and IT sectors

The state nodal agency West Bengal Industrial Development Corporation (WBIDC) has listed industrial parks and growth centres for the benefit of investors looking East towards the potentials of West Bengal.

In March 2024, the State Government made Haldia Industrial Park (306.96 acres), Haringhata (358.19 acres), Garbeta (350 acres), and other land parcels totalling 1,739.2 acres available for industrial park development. Other such notable parks are:

- Manikanchan, Salt Lake, Kolkata
- Vidyasagar Industrial Park, Kharagpur, Paschim Medinipur
- Durgapur Industrial Land (DPL Land)

6.2 Plug-and-Play Zones

As of 2025, the government has earmarked INR 2,500 crore for 12 specialized plug-and-play parks as part of the National Industrial Corridor Development Programme (NICDP). These parks feature pre-approved land with essential infrastructure, enabling businesses to begin operations in weeks rather than months.

A Cushman & Wakefield survey reveals that 88% of manufacturers have scaled up operations due to these parks, and 95% credit improved logistics access to government initiatives like Bharatmala and Sagarmala.

IPRS 3.0 has been launched to assess industrial parks, enhancing competitiveness and adherence to global infrastructure standards. NICDC projects focus on creating sustainable, walkable industrial zones with better connectivity and lower logistics costs.

The automotive, electronics, chemicals, and engineering goods industries are driving the demand for plug-and-play zones, drawn in by available infrastructure and shorter setup times.

6.3 Logistics Parks

India has approved development of 35 Multi-Modal Logistics Parks (MMLPs) at strategic locations including Chennai, Bengaluru, Nagpur, and Indore. Out of these, approximately 5 MMLPs are expected to be operational by 2027. These parks integrate warehousing, storage, transportation, rail, and road connectivity under schemes like Bharatmala and Sagarmala.[1]

The PM Gati Shakti National Master Plan coordinates efforts across 57 ministries and 36 states to create unified infrastructure development, accelerating logistics park projects and multimodal transport networks.[2]

6.4 Single-Window Clearance & Investment Synergy Committee

NSWS merges the clearance processes of central ministries and state governments, enabling the submission of various clearances through a single, unified application form, complete with real-time tracking and investor dashboards. As of October 2024, 32 central ministries and 29 states/UTs are connected with NSWS. More than 7.1 lakh approval applications have been submitted through the platform, of which about 4.81 lakh have been approved, indicating a rise in digital adoption. States maintain their own Single Window Clearance Authorities that are integrated with the national platform.

Investment Synergy Committees

Shilpa Sathi offers a streamlined service for large industries by providing single-window application support through representatives from different government departments at the West Bengal Industrial Development Corporation (W.B.I.D.C.) office. Participants from the Labour Department, Fire and Emergency Services, Power, Irrigation and Waterways, Pollution Control Board, and Kolkata Municipal Corporation are involved in the Single Window Cell. This cell helps accelerate the processing of various clearances needed from government departments and authorities for establishing industrial units within the state.

6.5 License Rationalisation & Decriminalisation

For manufacturing to flourish, regulatory and procedural ease matters — from setting up to operating units. India has launched and announced several reforms to cater to the increasing interest from both domestic and international investors in industries necessitating a governance system that adheres to global standards of efficiency and accountability.

The national government has removed criminal status from over 3,400 legal provisions across approximately 42 central and state laws, transforming numerous criminal offenses into civil penalties and alleviating the concern of imprisonment for minor procedural mistakes.

The Jan Vishwas Bill 2.0 (2023) has further advanced legal reform by streamlining offenses and raising fines by 10% every three years to maintain deterrence while avoiding severe penal repercussions for business errors.

Rationalization includes removing redundant licenses and approvals, consolidating them under a unified consent or license framework to minimize multiple approvals for the same business activity. This approach is facilitated by policies like the National Single Window System (NSWS) which digitizes and unifies clearances.

6.6 SEZ Renewal & Trade Facilitation Reforms

Trade Facilitation Reforms

Integrated Logistics and Customs - SEZ reforms align with PM Gati Shakti initiatives to improve port access & customs clearances, reducing cargo dwell times. .

Digital Compliance & Dispute Resolution - Digital platforms provide faster approvals and structured dispute resolution, simplifying compliance within SEZs.

Support for Innovation & Skill Development - New innovation funds and skill centres are being created to enhance SEZ competitiveness through research and workforce development.

SEZ Amendment Rules, 2025

Reduced Land Requirements - Minimum land area for semiconductor and electronic manufacturing SEZs decreased from 50 to 10 hectares

Sectoral Focus - Minimum land requirements for textile SEZs in Gujrat reduced from 20 to 4 hectares.

Net Foreign Exchange Norms - Revised NFE calculations include domestic sourcing and free goods.

Encumbrance-Free Land Relaxation - Land mortgaged or leased by central/state agencies can now be Included as SEZ land.

Operational Flexibility - SEZ units can now serve domestic tariff areas after duty payments.

Approvals under Amended Rules - Micron Semiconductor and Aequs Group are immediate beneficiaries with significant investments.

West Bengal is actively aligning its Special Economic Zone (SEZ) renewal and trade facilitation reforms:

Relaxed Land Encumbrance Norms:

The amendments permit the Board of Approval to relax the previous requirements for encumbrance-free land titles when the land is mortgaged or leased to authorized Central or State government agencies.

Extension of Validity and Operational Flexibility:

SEZ developers in West Bengal are now granted extensions for the validity periods of Letters of Approval (LoA) and implementation timelines, acknowledging delays caused by infrastructure or market conditions.

Hybrid SEZ Models for Domestic and Export Markets:

The reforms to West Bengal's SEZ policy allow units to operate under a hybrid model, enabling them to serve domestic tariff areas (DTA) by paying the applicable duties while still retaining export benefits.

Trade Facilitation Initiatives:

Upgrades to customs, warehousing, and logistics connectivity around key SEZs in West Bengal

07 Sustainable and Responsible Industrial Growth

As global manufacturing progresses, the necessity for sustainable and responsible business practices has transformed from a choice to a requirement for India's industrial development. To achieve India's goal of inclusive and competitive manufacturing, the nation must integrate Environmental, Social, and Governance (ESG) principles from the very beginning of project planning throughout manufacturing systems.

Green Industrial Zones & Clean Energy Integration

India is developing smart, eco-friendly industrial parks that combine industrial infrastructure with environmental sustainability, focusing on energy efficiency, pollution control, water conservation, and biodiversity enhancement. As of mid-2025, the country has over 209 GW of renewable energy capacity, aiming for 500 GW by 2030. These parks will utilize renewable energy sources and hybrid models, such as solar rooftops and wind farms, to reduce carbon footprints.

Government initiatives like GOBARdhan promote bio-CNG plants, enhancing the circular bioeconomy in industrial areas. Significant investments are being made in electrifying industrial zones with clean energy, developing water treatment facilities, and implementing digital systems to monitor energy consumption and emissions.

Policy and Regulatory Support

- The National Industrial Corridor Development Programme (NICDP) is establishing 12 new industrial nodes featuring integrated green infrastructure that promotes sustainable practices and efficient connectivity.
- The Ministry of Environment, Forest, and Climate Change has updated greenbelt regulations to require at least 10% common green space with dense plantations in industrial estates, and 15% for red-category industries to mitigate pollution and enhance biodiversity.
- Various states are also promoting green manufacturing, renewable energy use in industries, and the development of eco-parks in industrial corridors.

West Bengal Case Example: Kolkata Green Belt Development – Kolkata is establishing green belts alongside the Eastern Metropolitan Bypass and riverfront regions to decrease vehicle emissions and urban heat, supporting initiatives to control industrial pollution. The initiative encompasses widespread tree planting, the development of mini-forests, and the establishment of public recreational parks, leading to a significant enhancement in urban air quality by 2025.

Energy Efficiency for MSMEs

The **ADEETIE (Assistance in Deploying Energy Efficient Technologies in Industries & Establishments)** program is a significant government initiative of July 2025 by the Ministry of Power and is being executed through the Bureau of Energy Efficiency (BEE). This program aims to encourage the implementation of energy-efficient technologies in Micro, Small, and Medium Enterprises (MSMEs) throughout India.

Overview of Key Aspects

01 **Implementation Duration -** FY 2025-26 to FY 2027-28, financial obligations extending to 2030-31.

02 **Financial Investment -** Budget of Rs.1,000 crore, aiming to attract Rs.9,000 crore in private funding and MSME loans.

03 **Scope -** Focuses on 60 industrial clusters across 14 energy-intensive sectors.

04 **Interest Subsidy -** 5% interest subsidy on loans for micro and small enterprises, 3% for medium enterprises.

05 **Technical Assistance -** Support for IGEA DPR and M&V to guarantee successful implementation and impact assessment.

06 **Digital Platform -** Comprehensive digital platform for MSMEs to access scheme details, apply, monitor, and receive technical help.

MSMEs involved in the program can potentially achieve reductions of up to 50% in energy consumption, resulting in decreased operational expenses and improved industrial competitiveness. The initiative is projected to create substantial job opportunities and expedite India's climate goals, including a 45% reduction in emissions intensity by 2030 and targets for net-zero carbon emissions by 2070.

ADEETIE Scheme for MSMEs in West Bengal

Coverage: ADEETIE targets MSMEs across 14 energy-intensive sectors, covering over 60 industrial clusters nationwide, including the leather and footwear cluster in Kolkata and its adjoining areas, facilitating energy audits, project reports, and implementation of energy-efficient technology.

Circular Economy & Waste-to-Value Models

Key Policy Initiatives and Frameworks:

- **Extended Producer Responsibility (EPR) Regulations (2026):** These require producers and brand owners to manage the lifecycle of plastic, e-waste, glass, paper, and metal packaging waste, promoting eco-design and recycling.
- **Swachh Bharat Circular Hubs:** Public-private partnerships create local recycling centres that improve waste collection by integrating informal workers.
- **National Plastic Waste Management (Amendment) Regulations, 2024:** These mandate online tracking of plastic waste, enhancing transparency through the National Plastic Waste Reporting Portal.
- **Mission LiFE and Bioeconomy Initiative:** Climate action programs support bio-composting and waste-to-biofuel projects, with a $165.7 billion investment promoting circularity in agriculture and energy.

ESG-Aligned Cluster Scorecards

- **SEBI's Business Responsibility and Sustainability Report (BRSR):** This regulation has mandated ESG reporting for the 1,000 largest listed companies and has extended this requirement to voluntary reporting from supply chain partners. This regulatory initiative generates a need for ESG data both at the cluster and supplier levels, fostering the development of scorecards that measure environmental and social metrics in accordance with global standards.
- **Industrial Cluster Capacity Building:** Organizations such as the Confederation of Indian Industry (CII) and specific sectoral bodies are facilitating training initiatives aimed at guiding clusters in the adoption of ESG best practices. These initiatives cover areas like environmental compliance, social responsibility, governance transparency, energy efficiency, pollution management, and occupational health.
- **Digital ESG Monitoring Platforms:** Emerging platforms integrate IoT data, satellite imagery, and ground-level sensors to deliver real-time monitoring of environmental factors such as pollutants, energy consumption, water usage, and waste management, which supply data for ESG scorecards to support ongoing improvement and adherence to regulations.
- **Kerala's ESG Investment Policy (2025):** Kerala has become the pioneering Indian state to adopt a comprehensive policy on ESG investments, which directs public expenditure and capital allocation with an ESG perspective. This initiative involves the creation of adaptable ESG criteria for monitoring performance and making investment decisions at the cluster level, establishing a significant benchmark.

West Bengal	
Area	**Description & Example**
Environmental Compliance	WBPCB's environmental impact assessments, public hearings, and real-time monitoring enforce standards at cluster/industry levels
Capacity Building	Training and workshops conducted to educate industries on pollution control and sustainability practices
Digital Systems	Decision Support System and OCMMS mobile tech aid transparent environmental clearance aligned with governance expectations
Policy Alignment	CII State Strategy Reports suggest adopting ESG-aligned scorecard frameworks tailored for West Bengal clusters

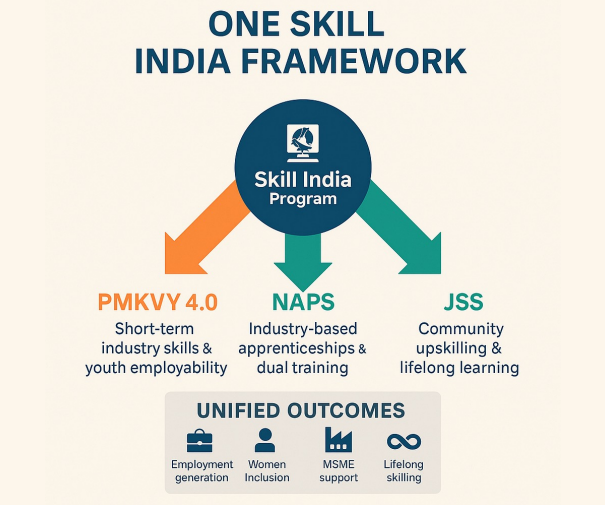
West Bengal is gradually incorporating ESG-aligned governance and environmental stewardship practices into its industrial clusters, aided by regulatory bodies like the WBPCB, the implementation of digital tools for enhanced transparency, and partnerships with industry organizations such as the CII. Although formal ESG-aligned cluster scorecards are still being created, they are indirectly bolstered by current environmental management systems and governance improvements.

08 Skill, Talent & Innovation Ecosystem

The competitiveness of India's manufacturing sector increasingly depends on its ability to equip the workforce with future-ready skills and build an innovation-driven industrial ecosystem. With over 52% of India's population below the age of 30, India possesses the human capital advantage to power Industry 4.0 provided it bridges the gaps in employability, applied learning, and industrial innovation.

To counter the ever-increasing skilled workforce demand, Government of India has taken initiatives like National Policy on Skill Development & Entrepreneurship (NPSDE), Pradhan Mantri Kaushal Vikas Yojana, Craftsmen Training Scheme (CTS), Jan Shikshan Sansthan (JSS), National Apprenticeship Promotion Scheme (NAPS), Entrepreneurship Training and Skill India Digital Hub platform. On the other side, India's manufacturing sector is swiftly growing thanks to initiatives such as Make in India and Production-Linked Incentives, which are intensifying the demand for skilled labour and innovation. Programs like the National Apprenticeship Promotion Scheme (NAPS) and updated vocational education systems are designed to close the gap between industry requirements and skills possessed by the workforce. Recent statistics indicate both achievements and persistent challenges: for instance, the number of apprentices in India participating in NAPS surged from approximately 35,500 in 2018–19 to over 4.5 million by 2025–26. West Bengal, recognized as an industrializing state, had roughly 21,008 apprentices registered under NAPS by mid November 2025 and has introduced its own Apprenticeship Promotion Scheme (WB-APS) to enhance stipends by INR 1,500 per month whereas Gujarat has the highest number of apprentices reported as high as 495540.

The Union Budget for 2025–26 significantly enhances India's manufacturing landscape highlighted by a revamped Skill India Programme with an outlay of INR 8,800 crore (US$1.1 billion) extended till 2026 . By merging Pradhan Mantri Kaushal Vikas Yojana 4.0, the National Apprenticeship Promotion Scheme and the Jan Shikshan Sansthan Scheme into a cohesive, industry-oriented framework, the program is developing a skilled, technology-savvy workforce that aligns with the changing requirements of contemporary industry.



8.1 Dual System of Training & In-Plant Training

The Dual System of Training (DST) initiative is designed to promote partnerships between industries and ITIs to provide training programs that enhance employability by addressing the specific skill demands of the industry. It merges classroom instruction at ITIs with practical, hands-on experience in various industries, allowing trainees to familiarize themselves with cutting-edge technologies. This initiative fortifies connections with the industry and equips ITI students with the current and relevant skills necessary for the workforce. The training program is being implemented across 49 sectors, including manufacturing, automotive, electrical, electronics, construction, IT-ITeS, and services. It operates under Memoranda of Understanding (MoUs) between ITIs and local industries. Industries provide infrastructure, mentors, and stipends for in-plant trainees, while ITIs manage academic delivery and certification.

For Trainees	For Industry	For Government/Institutes
Real-time exposure to shop-floor processes	Access to pre-trained, low-cost talent pipeline	Strengthened industry linkages and updated curricula
Increased employability & confidence	Reduced onboarding/training costs	Higher placement and performance outcomes
Easier transition from education to employment	Opportunity to shape skill supply chain	Feedback loop for continuous improvement

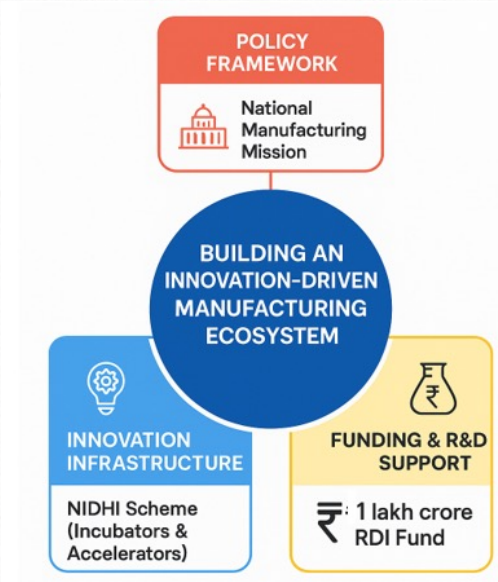
8.2 Manufacturing Research Hubs & Academia Linkages

India's research and development landscape is undergoing significant transformation, supported by a strong emphasis on growth through innovation. Consistent funding, favourable policies and reforms in institutions demonstrate the country's commitment to creating a self-sufficient, knowledge-centric economy that thrives on research and innovation. India is setting up dedicated centers and programs to translate research into industry applications and train future engineers. Initiatives include:

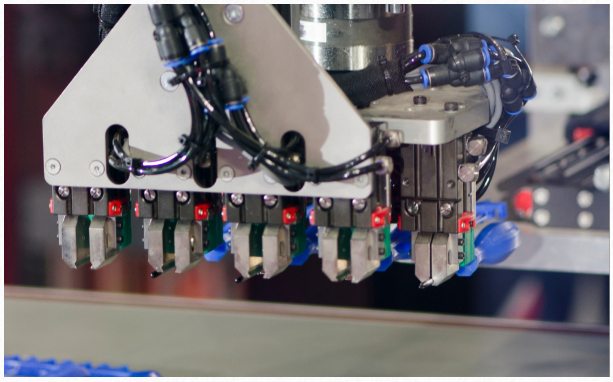
- **Industry 4.0 Demonstration Centers:** The Ministry of Heavy Industry's "SAMARTH Udyog Bharat 4.0" program has created a network of Industry 4.0 demo hubs (Common Engineering Facility Centres). These include the Center for Industry 4.0 (C4i4) Lab at Pune University, the IIT–Delhi/AIA Smart Manufacturing Centre, an Industry 4.0 platform at IISc Bangalore, a Smart Manufacturing Cell at CMTI Bangalore and an Industry 4.0 CoE at IIT Kharagpur in West Bengal. Such labs give companies and students hands-on exposure to robotics, IoT, AI and automation tools.

- **University–Industry CoEs:** India's Gross Expenditure on Research and Development (GERD) has increased more than twofold over the past decade, rising from INR 60,196.75 crore in the fiscal year 2010–11 to INR 1,27,380.96 crore in the fiscal year 2020–21. The Government sector is responsible for approximately 64% of the overall Gross Domestic Expenditure on Research and Development (GERD), whereas the private sector makes up about 36%. Leading institutions have established dedicated centers. For instance, IIT Kharagpur (WB) houses the Heavy Industry's Center of Excellence in Advanced Manufacturing, while additional IITs and IIEST Shibpur (WB) engage in projects related to semiconductors, materials science, and robotics.

- **Innovation Programs:** India is advancing toward a high-growth, innovation-driven manufacturing ecosystem through a series of strategic national initiatives that integrate policy, research, and industry collaboration. The Union Government has announced National Manufacturing Mission to provide policy support, execution roadmaps, governance and monitoring framework for central ministries and states. The NIDHI scheme by the DST has established a comprehensive network of technology incubators and accelerators across the nation, providing guidance to startups and grassroots innovators. Launched on November 3, 2025, the INR 1 lakh crore Research, Development and Innovation (RDI) Fund aims to strengthen India's R&D ecosystem by fostering a private sector-led innovation environment to accelerate progress in science and technology .



8.3 Startup Policy Thrust for Industrial Tech



India's startup ecosystem is being strengthened through a multi-pronged approach—national initiatives, sector-specific missions, and investor–incubator networks—all aimed at nurturing innovation, accelerating technology adoption, and fostering entrepreneurship across industries.

National Startup Initiatives: The Startup India initiative and the DPIIT recognition scheme offer tax advantages, simplified compliance, and financial support (such as the Startup Seed Fund Scheme) to startups in various sectors, including manufacturing and deep tech. SAMARTH 4.0 specifically mentions that "start-ups/incubators will be supported" in its mission pillars, demonstrating the government's dedication to fostering innovation-driven companies. Similarly, the Industry 4.0 roadmaps (SAMARTH) aim to connect academic programs with startups and incubators.

Sector Specific Push: The government has introduced targeted initiatives such as the India Semiconductor Mission, National Innovation Challenge for Drone Application and Research (NIDAR), IndiaAI-Mission and more to develop technology ecosystems. These initiatives create demand for new businesses; for example, the IndiaAI mission is supported by increased funding and goals for training. Similarly, West Bengal's startup policy (2020) promotes incubators in universities and provides land and seed funding for tech startups and facilitates the use of national R&D resources.

Investor & Incubator Support: India has established a robust network of investors and incubators that actively foster entrepreneurship and innovation. Angel investors, venture capital firms and government-supported funds like SIDBI's Fund of Funds for Startups (FFS) are providing essential financial support across various stages. In addition, more than 1,000 incubators and accelerators supported by programs such as Startup India, Atal Innovation Mission, and state innovation hubs offer startups guidance, infrastructure and access to markets. Corporate incubators and university-led innovation hubs have also surfaced as important facilitators, nurturing startups in specific sectors such as deep tech, healthcare and manufacturing. This collaborative ecosystem has positioned India among the fastest-growing startup environments globally, fuelling innovation and job creation.

8.4 Talent Readiness for Design, Robotics, Materials, Automation

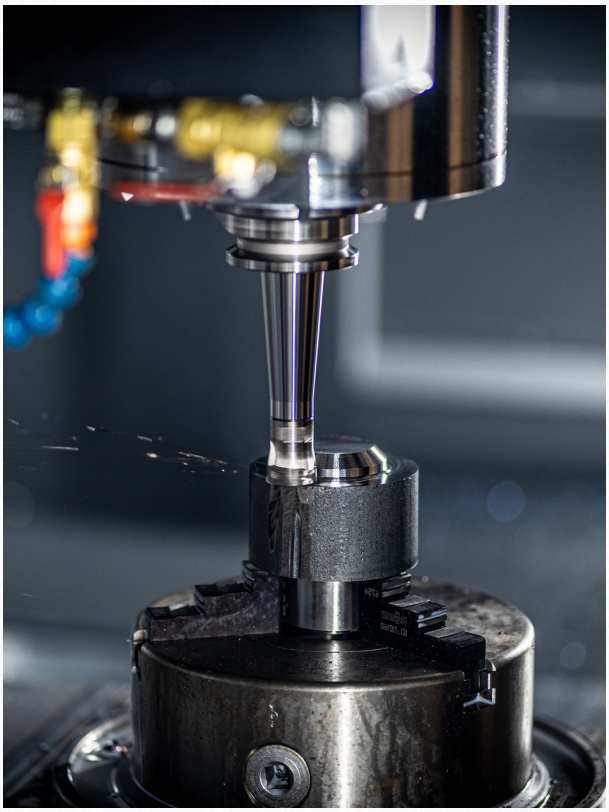
India's higher education and skill development sector is swiftly transforming to address the needs of Industry 4.0. Educational institutions, vocational centers, and industry organizations are progressively aligning their curricula, training initiatives, and facilities to cultivate a workforce prepared for the future. The emphasis is now on incorporating cutting-edge technologies such as AI and machine learning into engineering courses, while also introducing targeted training in areas like electronics, robotics, and the Internet of Things, shifting the focus towards hands-on, data-centric, and industry-relevant education.

Curriculum Integration: Universities are beginning to embed new technologies into core courses. Many colleges have started a B.Tech program in AI/ML, but notes the challenge is skilled faculty, not student interest. Experts emphasize that AI/ML tools should complement, not replace, engineering fundamentals, for instance, using AI-driven simulations in thermodynamics or CAD courses. This reflects a shift towards data-driven pedagogy and more lab work for engineering and design students.

Specialized Training: Sector skill councils and corporates are scaling up specialized certificates. Reports of the electronics industry note a projected shortage of 8–10 million skilled workers by 2027–28. In response, government and industry together are creating "skill bridges" (short courses, internships) in these domains. In West Bengal, technical institutes like NIT Durgapur features robotics laboratories under its Centre of Excellence for Advanced Research on IoT and Intelligent Systems (IoTIS), which emphasizes interdisciplinary research that encompasses robotics.

09 Key Takeaways and Strategic Recommendations

India's manufacturing expansion is currently situated at the convergence of digital transformation, diversification of global supply chains and enhancement of domestic capabilities. A coordinated national effort, rooted in innovation, skill enhancement and embracing technology is essential for achieving the objectives of the National Manufacturing Mission.



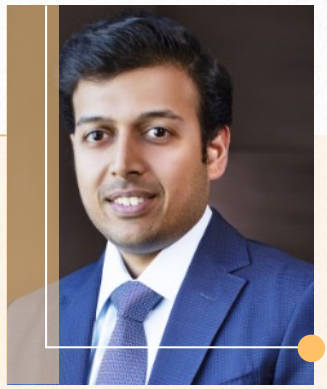
9.1 Priority levers for govt, industry, & investors

- **Policy Integration and Governance Alignment:** A cohesive National Manufacturing Mission should consolidate industry, skills, and innovation policies, establishing an integrated framework for quicker decision-making and more effective resource distribution. Both central and state governments need to enhance the ease and affordability of business operations through streamlined compliance, upgraded logistics, and infrastructure that attracts investment.

- **Industrial Capability and Workforce Transformation:** The industry's emphasis should transition toward building capabilities and embracing technology, allowing both MSMEs and larger manufacturers to adopt digital solutions, automation, and environmentally friendly manufacturing methods. Enhancing collaboration within clusters and expanding dual apprenticeship initiatives will improve productivity and prepare the workforce effectively.

- **Innovation and Investment Enablement:** Investors and financial institutions should serve as a driving force in fostering growth through innovation by financing industrial-tech startups, increasing the number of incubator networks, and advocating for sustainable finance. Collaborations between the public and private sectors, along with mixed funding strategies, can speed up the commercialization of R&D and support deep-tech entrepreneurship in both Tier-1 and Tier-2 cities.

Expert Opinion



India's manufacturing renaissance will be driven by technology, sustainability and collaboration. With India being viewed as the manufacturing hub for the world, an ecosystem that enables ease, speed and optimum cost of doing business will further fuel this momentum.
At JBM, we continue to pioneer this journey by fostering smart manufacturing and green mobility solutions that resonate with India's growth vision.
As we are transitioning towards Industry 4.0, our focus must be on creating globally competitive, innovation-led ecosystems that empower MSMEs, enable circular economies and accelerate green growth, positioning India as a resilient and future-ready manufacturing hub.

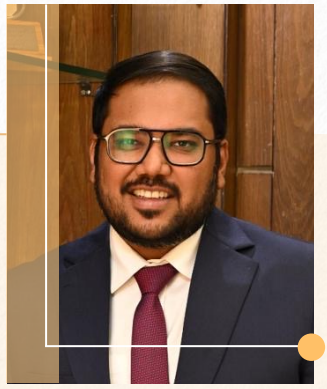
Nishant Arya

Vice Chairman,
JBM Group

India's manufacturing resurgence is not merely an economic milestone—it is the expression of our nation's creative strength, technological confidence, and collective ambition. As we stand on the threshold of a $1 trillion manufacturing economy, it is imperative that industry and policy move in harmony to build globally competitive, sustainable enterprises that carry the spirit of Viksit Bharat to the world.

Aditya Vikram Birla

Chairman & Managing Director,
Cosmic Birla Group



India's manufacturing story is at an inflection point. It is clear that technology, sustainability, and MSME strength will define our next decade. At Rahee Group, we see this as India's moment to build world-class, future-ready manufacturing ecosystems that can thrive globally. Continued Foreign collaborations, transfer of technology and a focus on quality will see India's $1 trillion manufacturing goal not just be achievable — it will be inevitable.

Devansh Khaitan

Executive Director
Rahee Group

In manufacturing, doing the right thing for the planet is also proving to be good for business. The shift toward greener production, recycling, and better energy use is already helping businesses work more efficiently and responsibly. I believe India's manufacturing future will belong to those who balance innovation with care, for both people and the environment.

Arpit Goyal

Managing Director
GLS Group

9.2 Implementation Roadmap

To accelerate India's manufacturing transformation, the implementation roadmap must emphasize integration, innovation, and inclusivity. A unified governance framework under the National Manufacturing Mission should align industrial, skilling, and innovation initiatives to ensure policy coherence and faster execution.

Future-Ready Industrial Clusters

Developing future-ready industrial clusters with modern infrastructure, digital connectivity, and shared R&D facilities will enhance productivity and attract global investment. Expanding these ecosystems across Tier-2 cities can promote balanced regional growth and strengthen MSME participation.

Skilled and Adaptive Workforce

A skilled and adaptive workforce will remain the foundation of competitiveness. Industry-aligned training, dual apprenticeships, and partnerships between academia and industry should create continuous upskilling pathways in emerging domains like automation, AI, and green manufacturing.

Innovation and R&D-Led Growth

Promoting innovation and R&D-led growth is essential for long-term resilience. Enhanced collaboration among research institutions, industries, and startups should drive product design, technology diffusion, and faster commercialization of innovations.

Investment & Incubation Ecosystem

A supportive investment and incubation ecosystem must sustain this momentum. Expanding access to venture capital, strengthening incubators, and incentivizing sustainable, ESG-driven manufacturing will ensure India's rise as a hub for advanced and responsible production.

References

1. https://prsindia.org/files/budget/budget_state/west-bengal/2025/West_Bengal_Budget_Analysis_2025-26.pdf
2. https://finance.wb.gov.in/writereaddata/Budget_Speech/2024_English.pdf
3. https://www.wbidc.com/home/export
4. https://silpasathi.wb.gov.in/
5. https://wbiidc.wb.gov.in/growth-centres
6. https://economictimes.indiatimes.com/news/india/west-bengal-cabinet-grants-industry-status-to-logistics-sector-approves-200-acre-corridor-project/articleshow/123980232.cms?from=mdr
7. https://finance.wb.gov.in/writereaddata/Budget_Speech/2024_English.pdf
8. https://wbiidc.wb.gov.in/growth-centres
9. https://wbindustries.gov.in/policies-schemes/Notification_for_West_Bengal_Logisties_Policy.pdf
10. https://www.dnb.co.in/files/reports/MSME_West-Bengal_2025.pdf
11. https://www.wbidc.com/home/export
12. https://indianexpress.com/article/explained/half-indias-population-under-age-30-nfhs-explained-7910458/
13. NAPS Dashboard
14. pib.gov.in/PressRelease
15. https://heavyindustries.gov.in/en/samarth-udyog-bharat-40
16. Press Release:Press Information Bureau
17. https://dst.gov.in/rdi-scheme/research-development-and-innovation-rdi-cell
18. https://manufacturing.economictimes.indiatimes.com/news/industry

About ASSOCHAM

ASSOCHAM initiated its endeavor of value creation for Indian industry in 1920. It brings in actionable insights to strengthen the Indian ecosystem, leveraging its network of more than 4,50,000 members, of which MSMEs represent a large segment. With a strong presence in states, and key cities globally, ASSOCHAM also has more than 400 associations, federations and regional chambers in its fold.

Aligned with the vision of creating a New India, ASSOCHAM works as a conduit between the industry and the Government. The Chamber is an agile and forward-looking institution, leading various initiatives to enhance the global competitiveness of the Indian industry, while strengthening the domestic ecosystem. With more than 100 national and regional sector councils, ASSOCHAM is an impactful representative of the Indian industry. These Councils are led by wellknown industry leaders, academicians, economists and independent professionals. The Chamber focuses on aligning critical needs and interests of the industry with the growth aspirations of the nation.

ASSOCHAM is working hand in hand with the government, regulators and national and international think tanks to contribute to the policy making process and share vital feedback on implementation of decisions of far-reaching consequences. In line with its focus on being future-ready, the Chamber is building a strong network of knowledge architects. Thus, ASSOCHAM is all set to redefine the dynamics of growth and development in the technology-driven 'Knowledge-Based Economy. The Chamber aims to empower stakeholders in the Indian economy by inculcating knowledge that will be the catalyst of growth in the dynamic global environment.

Vision

Be the knowledge architect for the Indian economy, with a focus on strengthening India's domestic ecosystem and enhancing global competitiveness.

Mission

Its mission is to impact the policy and legislative environment so as to foster balanced economic, industrial and social development.

For more information, contact

Perminder Jeet Kaur Senior Director East & Northeast

Eastern Regional Headquarters:
Unit 1002, 10th Floor, Signet Tower, DN 2, Sector V Salt Lake, Kolkata -700091

Odisha office:
Workloop, 316, Esplanade One, Rasulgarh, Bhubaneswar – 751010

North East office:
C/o Mr Sanjive Narain, Chairman NE Regional Council, MD AM Television, Ulubari, Guwahati, Assam

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for building a better tomorrow

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Primus Partners has been set up to partner with clients in 'navigating' India, by experts with decades of experience in doing so for large global firms. Set up on the principle of 'Idea Realization', it brings to bear 'experience in action'. 'Idea Realization'— a unique approach to examine futuristic ideas required for the growth of an organization or a sector or geography, from the perspective of assured on ground implementability.

Our core strength comes from our founding partners, who are goal-oriented, with extensive hands-on experience and subject-matter expertise, which is well recognized in the industry. Established by seasoned industry leaders with extensive experience in global organizations, Primus Partners boasts a team of over 350 consultants and additional advisors, showcasing some of the finest talent in the nation.

The firm has a presence across multiple cities in India, as well as global offices across UAE, Saudi and USA.

India Offices

Bengaluru
91 Springboard
Business Hub 175, 176
Bannerghatta Rd,
Dollars Colony,
Bengaluru – 560076

Chandigarh
2nd Floor, Netsmartz,
Plot No. 10, Rajiv
Gandhi Chandigarh
Technology Park,
Chandigarh – 160019

Chennai
147, Pathari Rd, Door #3,
WorkEz Hansa Building,
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Chennai, TN - 600006

Delhi
1 to 7, UG Floor,
Tolstoy House,
Tolstoy Road,
Connaught Place
New Delhi - 110001

Kolkata
Collab Deck (Cabin W1021)
Kankaria Centre,
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Street Area,
Kolkata - 700071

Mumbai
156/157, 15th Floor,
Nariman Bhavan,
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Nariman Point,
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International Offices

Dubai
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