



INDIA BRIEFING

From Dezan Shira & Associates

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Inside India's Manufacturing Revolution: Strategies and Insights for Business Success

Understanding India's Manufacturing Landscape Pg 04

Navigating Market Entry and Expansion Strategies Pg 12

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Introduction



ROHIT KAPUR

Managing Director
Dezan Shira & Associates
New Delhi Office

India is emerging as an important manufacturing destination in Asia due to several factors. It boasts a large, cost-effective labor force and a massive domestic market of over 1.4 billion people. Its strategic location facilitates access to both domestic and international markets.

Government initiatives like the Production-Linked Incentive Schemes aim to attract investment and simplify regulatory processes. In the realm of infrastructure, there has been massive spending led by the government and public sector undertakings.

Policymakers prioritize renewable energy and frontier industries like IoT and semiconductor manufacturing, besides aligning with global sustainability goals. Negotiations for trade agreements aim to bolster India's access to global markets and promote domestic exports.

In this edition of *India Briefing Magazine*, we explore India's evolving manufacturing landscape, spotlighting key initiatives and investor challenges. We offer insights into market entry strategies for foreign stakeholders and expansion avenues for domestic players seeking foreign capital and technology integration. Additionally, we delve into India's futuristic industries while emphasizing sustainability objectives.

Dezan Shira & Associates, with its extensive experience and local expertise across India, stands ready to assist enterprises in navigating the dynamic Indian market. For inquiries, contact us at india@dezshira.com. India's manufacturing prowess is on the rise, offering abundant opportunities for those poised to seize them.

With kind regards,

Rohit Kapur



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Credits

Publisher - Asia Briefing
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Lead Editor - Melissa Cyrill

Contributors - Naina Bhardwaj,
Archana Rao, Umair Haque,
Koushan Das

Designers - Aparajita Zadoo,
Miguel Enrico Anciano

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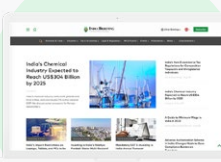
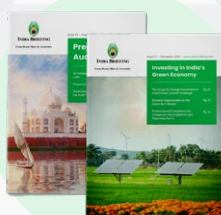
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Understanding India's Manufacturing Landscape

India is strategically positioning itself to become a global manufacturing hub to meet domestic growth objectives, achieve export targets, and fulfill geopolitical aspirations.



Melissa Cyrill
Deputy Managing Editor
Asia Briefing

India's ascent as a premier manufacturing hub for global firms is fueled by several key factors. Its expansive developing economy, coupled with strategic logistics and maritime capabilities, alongside a substantial consumer base, form the bedrock of its appeal. Investments in both physical and digital infrastructure, complemented by landmark tax reforms, have nurtured a conducive business environment.

The government's pro-business policies further amplify India's attractiveness. Moreover, abundant natural resources and a youthful workforce provide fertile ground for sustainable growth and innovation.

Emphasizing high rates of technology adoption and a commitment to sustainability, India's readiness for modern manufacturing solidifies its status as a sought-after destination for global firms looking to expand operations.

State of the economy and manufacturing ambitions

India is projected to be the fastest-growing major economy over the next three years, particularly as credit rating agencies observe a slowdown in China. India hopes to become the third-largest economy in the world with a GDP of US\$5 trillion in the next three years and touch US\$7 trillion by 2030 on the back of continued reforms. Ten years ago, India was the 10th largest economy in the world, with a GDP of US\$1.9 trillion at current market prices. Today, it is the 5th largest with a GDP of US\$3.7 trillion (estimate FY24).

The Indian economy is now entering a pivotal phase on the S-curve, characterized by rapid urbanization, industrialization, rising household incomes, and increased energy consumption. This phase, spanning several decades, typically witnesses accelerated growth in these domains.

India's manufacturing sector currently accounts for around 17 percent of the country's GDP. The sector is experiencing a surge in investments, positioning the country as a strong emerging player in global supply chains. The mobile phone industry is a standout example and could provide a template for how industrial policies can attract foreign investments and lead to optimal production outcomes.

In fact, policymakers in India want it to become the new-age factory of the world and aim to raise manufacturing to 25 percent of the GDP by 2025. There is a sense of urgency as well—with such a large workforce and a median age of around 28, India needs to create jobs at a faster pace which cannot be met by the services sector alone.

Manufacturing sector performance

In the first quarter of FY 2024 (April-June 2023), the manufacturing gross value added (GVA) reached an estimated US\$110.48 billion. By January 2024, India's manufacturing activity measured on the PMI Index recorded 56.5, the highest in four months, driven by increased export orders.

Projections for real GDP growth for FY 2023-24 stand at 7.3 percent, with manufacturing GVA growth forecasted to accelerate to 6.5 percent from a modest 1.3 percent the previous year. Additionally, mining GVA is expected to rise by 8.1 percent, up from 4.6 percent in 2022-23, while construction GVA growth is anticipated to remain robust at 10.7 percent, building upon the 10 percent increase observed in 2022-23.

Regional spread of manufacturing capacity

Projections from Colliers indicate that by 2025-26, the manufacturing market in India could reach an impressive US\$1 trillion milestone, with Gujarat

emerging as a key manufacturing hub, closely followed by Maharashtra and Tamil Nadu. These regions boast conducive environments for industrial investments, driven by factors such as labor availability, robust infrastructure, and government support.

Notable investments from giants like Toyota, Coca-Cola, and Micron Technology underscore Gujarat's emerging appeal as a manufacturing destination. Maharashtra, with its high FDI inflow and well-established and conducive business environment, closely trails Gujarat, while Tamil Nadu's skilled workforce, strong traditional industries, and vibrant ODM/OEM ecosystem contribute to its strong position in the Indian manufacturing landscape. The automotive, electronics, and textiles sectors are leading India's manufacturing growth trajectory, attracting significant foreign investments and witnessing increased merger and acquisition activities. These three states stand out in terms of their performance in these sectors alongside other heavyweights like Karnataka, Haryana, and Telangana.



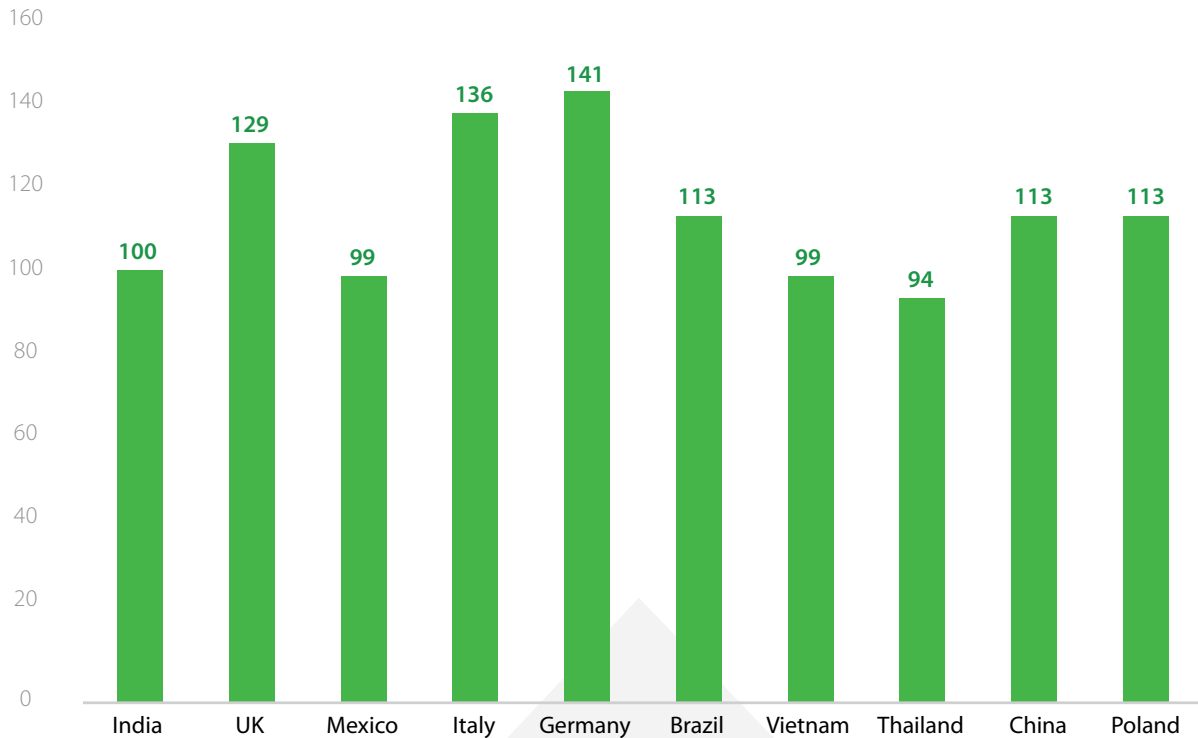
HOW WE HELP COMPANIES SUCCEED WITHIN THE MANUFACTURING SECTOR

Dezan Shira & Associates has helped a wide array of foreign and domestic businesses successfully establish and optimize manufacturing operations in India. At the pre-investment phase, the firm can help evaluate individual markets, identify locations for establishment, and structure supply chains. We can also help maximize profitability and maintain statutory compliance once operational.

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Comparative Insights into India's Competitiveness

Landed cost competitiveness (%)



Benchmarked to India; China cost includes tariff war with USA | Source: BGC Analysis

*Landed cost includes tariffs, logistics, labor (productivity adjusted), machinery, electricity, fuel

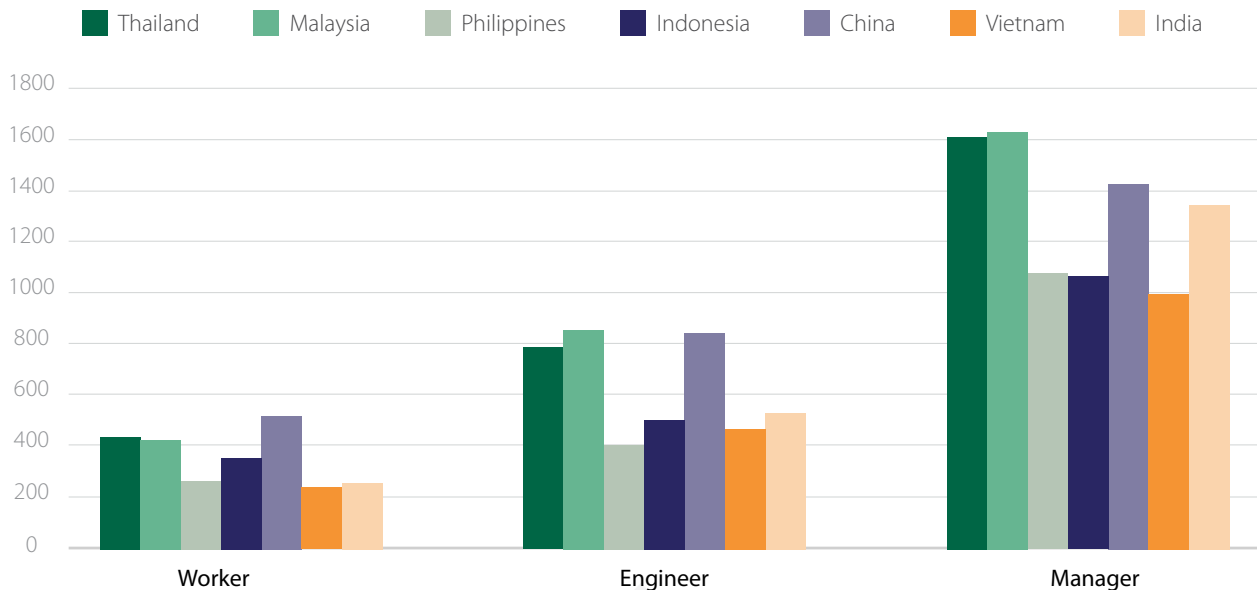
Factors	India	Brazil	China	Vietnam
Workforce (Millions)	524	108	782	32
Water (US\$/mtr ³)	17	30	58	65
Power (US\$/KWh)	0.11	0.17	0.15	0.09
Global Innovation Index	40	57	11	48
Logistics Performance Index	38	51	19	43

Source: IEA, OECD

- ✓ Cost of labor in India is less than competing markets in Eastern Europe and comparable to ASEAN
- ✓ Recent push towards finalizing trade deals offers opportunity to position India as a global manufacturing & export hub

Global Supply Chain Diversification

Manufacturing wages (monthly base salary in US\$)



Source: JETRO

Key Announcements by Global Companies to Invest in India

Companies	Investment / (US\$ Bn)	Time period
Samsung, Foxconn, Lava, Wistron, Pegatron	5.6	FY 2021-26
Siemens Healthcare, Integris Healthcare, Poly Medicure	0.5	FY 2021-28
Nokia, Ciena, Flextronics	1.7	FY 2022-26
Nestle, Hindustan Unilever Ltd,	1.5	FY 2022-27
Daikin Group, Panasonic	0.9	FY 2022-26

Furthermore, emerging sectors such as semiconductors, agri-tech, and waste management demonstrate promising potential, fueled by advancements in technology and sustainable practices.

Supportive policies and government initiatives

A policy and spending focus on enhancing infrastructure and logistics connectivity, coupled

with efforts to streamline bureaucracy, has led to several global multinational corporations (MNCs) redirecting their investments to India. The country is also increasingly being chosen as a key production and assembly base in Asia due to geopolitical factors.

“Make in India”, “Atmanirbhar Bharat” (Self-Reliant India), the Production-Linked Incentive (PLI) schemes, the FAME Scheme, the Bharatmala Pariyojana Project to boost highway connectivity

among the country's major districts, the proposed DESH Bill to reform the special economic zones model, and the National Logistics Policy are among a handful of government initiatives that are playing a pivotal role in bolstering domestic manufacturing and attracting foreign investment.

Alongside an emphasis on sector-based manufacturing and policies geared towards the creation of local supply chains, the government has prioritized major infrastructure spending. Improving connectivity between industrial hubs, transport corridors and ports, and markets will accelerate the pace of manufacturing expansion in the country within the coming 10 years. By 2047, India wishes to become a developed country. Scaling up the country's manufacturing capacity alongside modernization and research and development will serve as necessary growth drivers.

Further, India's ease of doing business reforms have centered around streamlining and digitizing regulatory compliance processes throughout the entire business lifecycle, spanning from incorporation to the cessation of operations. For example, in the Union Budget for 2023-24, the government declared a reduction in over 39,000 compliances and the decriminalization of more than 3,400 legal provisions.

India's improving logistics

In terms of logistics, India has moved up six places to reach the 38th rank out of 139 countries on the Logistics Performance Index. The LPI index measures countries on six aspects of logistics performance, including infrastructure quality, customs efficiency, logistics services quality, international shipment arrangements, on-time delivery frequency, and shipment tracking. Logistics is integral to the growth of the manufacturing sector and any

The Bharatmala Pariyojna project

The Bharatmala Pariyojna is a comprehensive infrastructure project aimed at connecting 550 District Headquarters with a minimum 4-lane highway, increasing the number of corridors in India to 50 and moving 80 percent of freight traffic to National Highways. This initiative involves the development of logistics parks, inter-corridors, feeder routes, and waterway ports, along with the construction of tunnels, bridges, flyovers, and interchanges to ensure optimized connectivity. Funded by the central government, Bharatmala integrates various existing highway projects, including the National Highways Development Project (NHDP). With an estimated investment of INR 10.63 trillion (approx. US\$128.04 billion), it prioritizes connecting remote areas and satellite cities of major urban centers. The project spans across states like Maharashtra, Gujarat, Rajasthan, and extends to the Himalayan territories and border regions, with a focus on rural and tribal areas. Additionally, Bharatmala aligns with other government schemes like Sagarmala (for maritime and port infrastructure development), Dedicated Freight Corridors, and Make in India, serving as both an enabler and beneficiary of national development initiatives.

improvements in the country's logistics ecosystem has business positive outcomes—ranging from operational efficiency to expanding supplier networks to boosting last-mile-reach to meet demand.

Consequently, India seeks to reduce its logistics costs from 16 percent of the GDP to a global average of 8 percent by 2030. Per some estimates, the worth of the Indian logistics market will be around US\$215 billion in the next two years.

The Production Linked Incentive Schemes

The Production-Linked Incentive (PLI) Schemes are a strategic initiative by the Government of India, aimed at fostering domestic manufacturing as a catalyst for India's economic growth and employment generation. The PLI Schemes involve significant financial allocations, with a total outlay of INR 1.97 trillion (over US\$23 billion) for 14 key sectors.

All sectors approved under the PLI Schemes adhere to a broad framework centered around new and emerging technologies. Capacity development in these areas offer India the opportunity to leapfrog and achieve substantial economic gains while also harnessing their export potential.

The core objectives of the PLI Schemes are to improve efficiency, foster economies of scale within the manufacturing sector, and position Indian manufacturers as globally competitive, thereby facilitating their integration into global value chains.

Under the PLI Schemes, financial incentives of 4-6 percent are disbursed over a specified period on incremental sales of products manufactured domestically. Incentives are not guaranteed and are released based on annual performance and meeting stipulated criteria in the respective Scheme Guidelines. Eligible enterprises must hit their yearly targets to receive the incentive payout for the scheme's operational period, which ranges from 4-6 years after the base year. The PLI Schemes thus allow a gestation period for applicants to begin commercial production.

Official data released on January 17, 2024, showed that the PLI schemes saw over INR 1.03 trillion (approx. US\$12.40 billion) worth of investment till November 2023. This investment in turn resulted in production/sales worth INR 8.61 trillion (approx. US\$103.72 billion) (US\$1=INR 83.01). Besides, more than 678,000 jobs (both direct and indirect) have been created in the process.

Key sectors

Compared to China's mature manufacturing capacities, India has only recently set 'the ball rolling'. Vendors of large American, European, and Asian companies are gradually building up their presence in India, with automotive, electronics, and footwear manufacturing being just few examples.

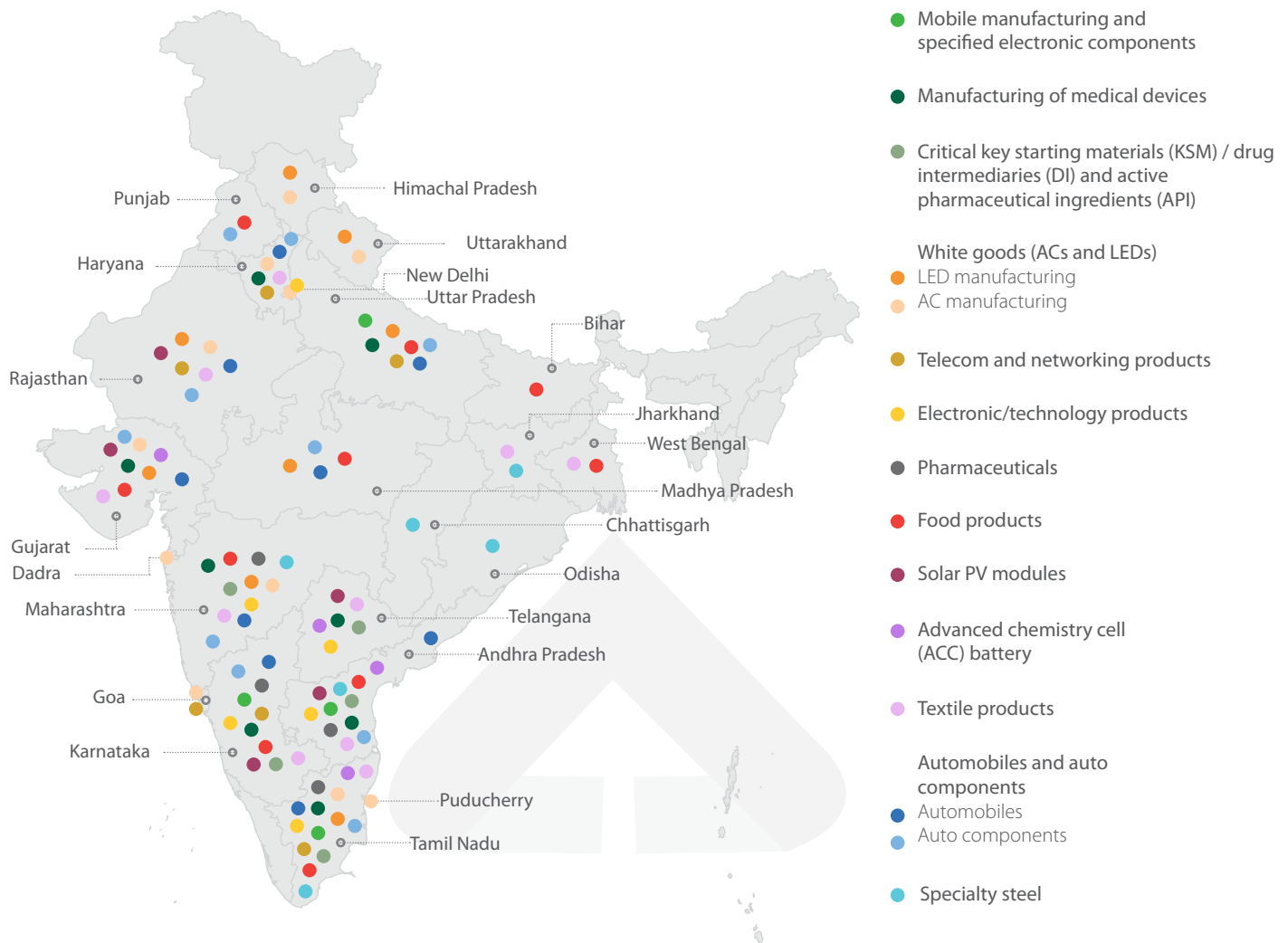
India's automotive sector is a cornerstone of the nation's manufacturing prowess and has garnered significant attention from global giants like Toyota, Kia, Tesla, and Ford, signaling their intentions to either establish, expand, or re-enter manufacturing operations within the country.

Likewise, the electronics manufacturing industry has experienced a surge in investments, particularly in the smartphone production segment. Notably, major players such as Apple's contract manufacturers have set up assembly units in India, signaling a shift towards localized production strategies.

Furthermore, the textiles and garment manufacturing sectors have witnessed increased investment activities, with several global brands reassessing their sourcing strategies and investing in Indian textile units to leverage the country's competitive advantages in this domain.

In line with fostering industrial growth, the Government of India's Ministry of Heavy Industries

Investing in PLI Target Sectors: Major States and Union Territories Offering Industrial Setup



and Public Enterprises introduced SAMARTH Udyog Bharat 4.0 in 2021. This strategic initiative aims to bolster the competitiveness of the manufacturing sector, primarily focusing on the capital goods domain.

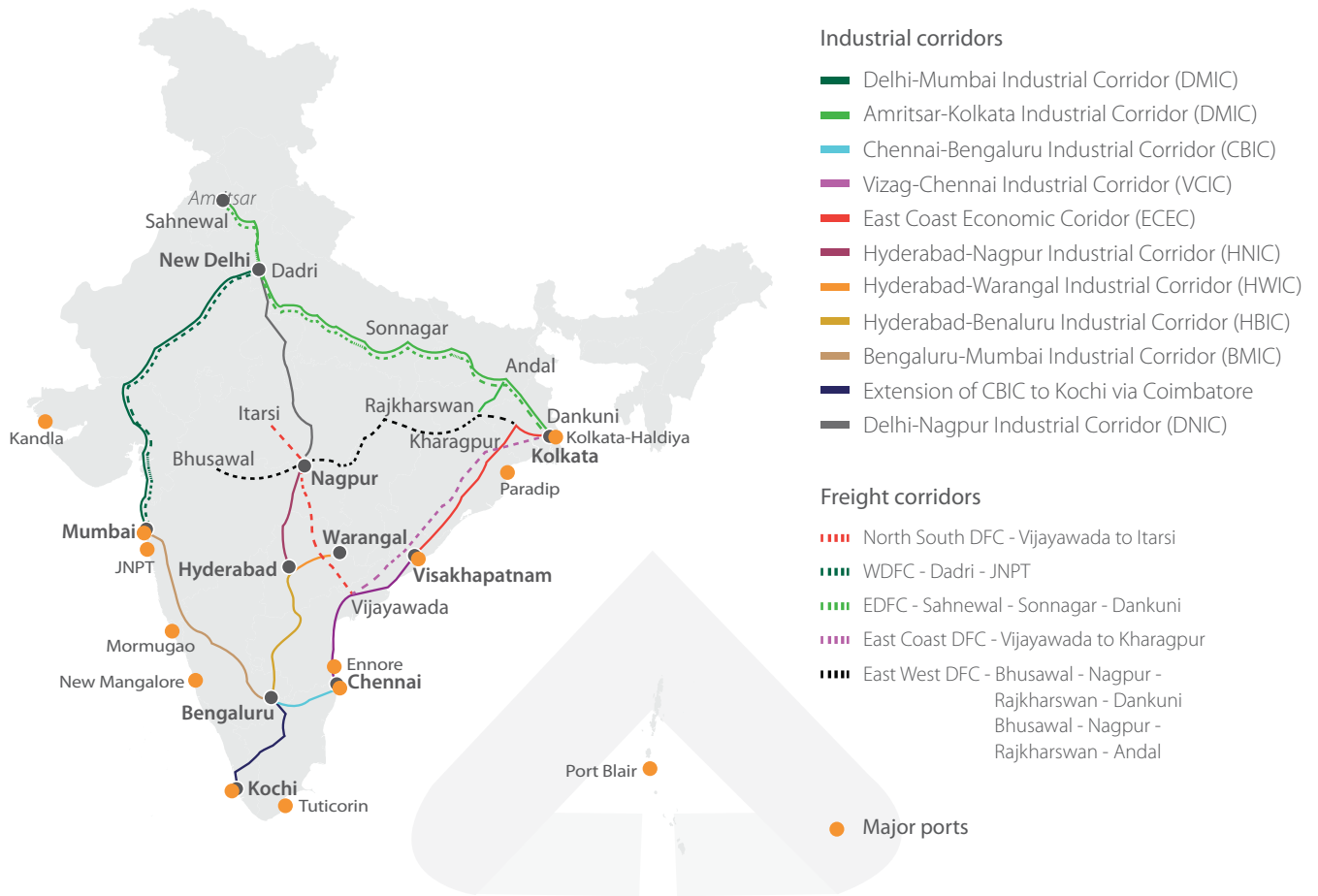
Moreover, the central government remains steadfast in promoting comprehensive national development by prioritizing the development of industrial corridors and smart cities, that feed into investment opportunities and capital requirements in the construction and allied industries. Per investment management company Colliers,

upcoming planned industrial corridors are creating a conducive environment for industrial growth, potentially generating employment opportunities for over 27 million workers.

Challenges and opportunities in the manufacturing sector in India

As foreign manufacturers and investors consider entering the Indian market, they will have to navigate diverse challenges and opportunities inherent in the country's manufacturing landscape.

Planned Industrial and Freight Corridors and Port Connectivity



Understanding India's regulatory environment and its nuances across different states is paramount. Tapping into national industrial programs, including incentives for sunrise industries, can lower costs.

Investing in complementary sectors may additionally be necessary to optimize operations and introduce management efficiencies. India's technology sector presents opportunities for innovative and hyperlocal solutions.

Recognizing India's infrastructure deficits, particularly in port capacity, underscores the need for strategic investments in transportation and logistics infrastructure. Exploring partnerships with local entities and subscribing to government

schemes can facilitate smoother entry into the market.

Moreover, aligning investment strategies with India's burgeoning sectors, such as mobile phones, renewable energy, and advanced manufacturing, can position foreign manufacturers and investors for long-term success.

Ultimately, navigating India's dynamic business landscape requires patience, strategic planning, and a willingness to adapt to local market dynamics. By leveraging opportunities and addressing challenges proactively, foreign firms can unlock the vast potential of India's manufacturing sector. 🇮🇳



Navigating Market Entry and Expansion Strategies

As India's domestic manufacturing sector experiences robust growth on the back of millions of MSMEs, reaching the next level of growth, accessing global export markets, and achieving sustainable success will require greater expertise, technology, and capital investments.



Melissa Cyrill
Deputy Managing Editor
Asia Briefing
Author



Naina Bhardwaj
Assistant Manager
International Business Advisory
Contributor

India's emergence as a significant economic player presents attractive prospects for foreign investors and businesses alike. The country has distinctive attributes, including a dynamic policy environment, large and differentiated consumer markets, and a robust digital infrastructure.

By 2031, India is projected to drive one-fifth of global economic growth. This will be underpinned by the convergence of several key trends, including global offshoring capabilities, digital innovation, and a shift towards cleaner energy sources.

India's favorable demographic profile—reflected in its large workforce and customer market—as well as its consistent growth trajectory makes it a relatively safe bet as a manufacturing investment destination.

Market entry strategies for foreign manufacturers

Despite the scale of the India opportunity, foreign manufacturing firms may find specific Indian states

to be more advantageous, with a strong presence of allied sectors, business incentives, subsidies, robust infrastructure, and essential utilities.

Foreign companies must meticulously evaluate factors such as the ease of doing business, implementation of government policies, economic conditions, pricing, labor availability, regulatory environment, supply chain efficiency, proximity to transport nodes, and raw material accessibility before establishing their enterprise.



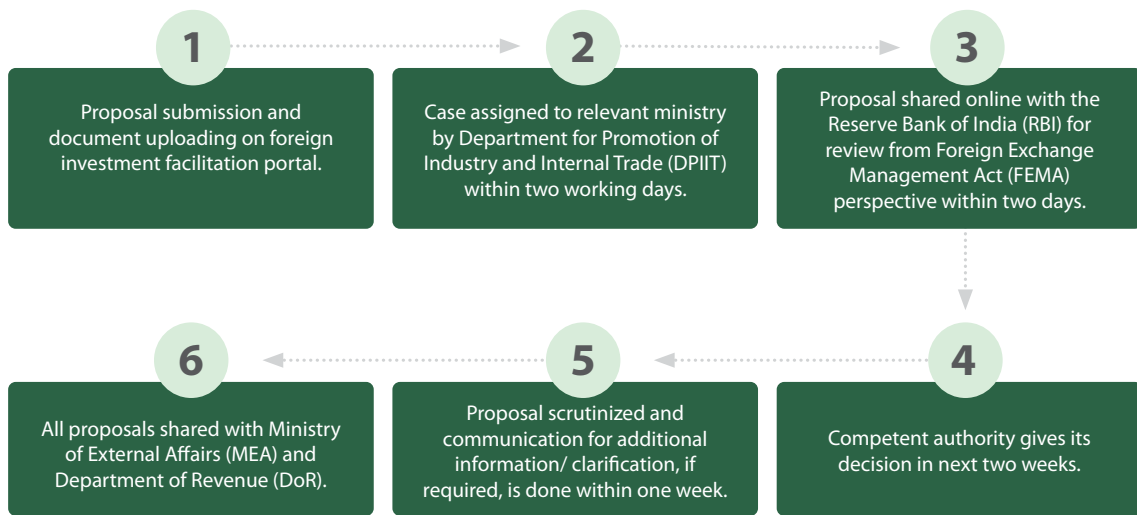
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India's FDI Regulatory Landscape

FDI approval process



100% automatic route	Up to 100% automatic route	Up to 100% government and automatic route	Up to 100% under government route
Agriculture, automotive, biotechnology (greenfield), broadcast content services, chemicals, education, ecommerce activities, construction of hospitals, food processing, healthcare (greenfield), IT/BPM, among others.	Infrastructure company in the securities market, Insurance, medical devices, pension, petroleum refining (by PSUs), power exchanges	Banking (private sector), biotechnology (brownfield), defense, healthcare (brownfield), pharmaceuticals (brownfield), private security agencies, telecom services.	Banking (public sector), food products retail trading, core investment company, investment by foreign airlines, multi-brand retail trading, satellite, among others.

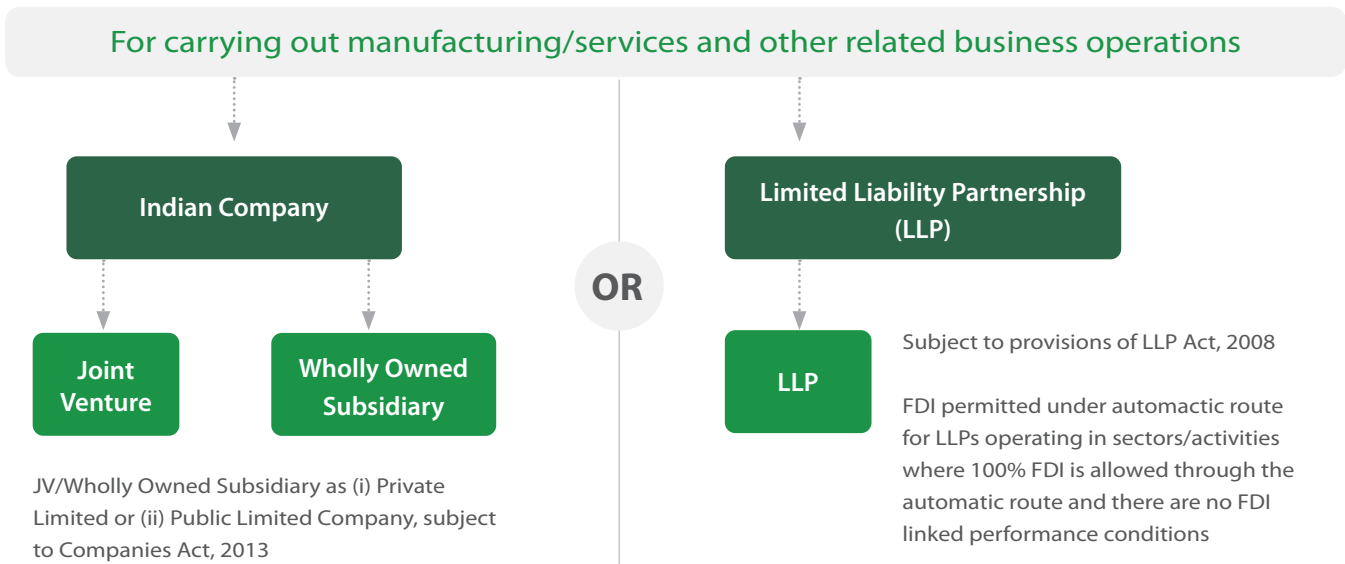
Expansion strategies for Indian manufacturers

In the rapidly evolving landscape of the manufacturing industry, Indian players, including ODM (original design manufacturer)/OEM (original equipment manufacturer) entities, find themselves at a pivotal moment ripe with opportunities for expansion. As companies worldwide contend with increasing supply chain risks and are keen to distribute their supplier networks across a wider geography, Indian manufacturing players stand much to gain. With the right strategies in place, they can not only solidify their

market presence but also thrive in an increasingly competitive global economy.

- Market diversification:** One of the key strategies for expansion involves diversifying into new markets. This entails exploring untapped regions within India and venturing into international territories where demand for their products exists. By conducting thorough market research and understanding consumer preferences and regulatory landscapes, manufacturers can identify emerging opportunities and mitigate risks associated with overreliance on a single market.

Modes of Incorporation Available to a Foreign Investor to Set Up Business in India



Essential Processes and Compliances for Setting Up a Business in India

Setting up legal existence	Registering and starting a unit	Pre-commissioning phase	Post-commissioning phase
<ul style="list-style-type: none"> Obtain Digital Signature Certificate (DSC) for proposed Directors Obtain Director Identification Number (DIN) for the Directors Approval for proposed Company/ LLP Name Finalization of supporting documents Filing of e-forms with CRC Verification of documents Consent to establish & operate Obtain Permanent Account Number (PAN) Registration for Tax Account Number (TAN) Registration of GST 	<ul style="list-style-type: none"> Registering / categorization of unit in State Approval for State Incentives (Optional) IEM/EM Registration MSME Registration 	<ul style="list-style-type: none"> Acquisition of Land Environment, Forest and Wildlife Clearance Permission for Land Use Pollution Board Industrial License Consent to Establish Factory Layout Plan Approval Registration of Boilers Building Plan Approval Registration under Contract Labor Act 1970 Registration under BOCW Act Power for construction Provisional Fire Approval Approval for lifts and Escalator Environment, Forest and Wildlife Clearance Permission for Land Use Pollution Board 	<ul style="list-style-type: none"> Consent to operate Building Completion certificate Final Fire Approval Water Connection Power Authorization for hazardous waste Professional Tax Registration Central Excise Registration Shops & Establishment Act Employee Registration with ESIC Employer Registration with EPFO Trademark/ Brand Registration Importer Exporter Code (IEC) Customs- Special Valuation Branch Grant for Bureau of Indian Standards (BIS) License Quality Marking Certificate

- **Strategic partnerships and collaboration:** Collaborating with other businesses, suppliers, distributors, or even competitors can unlock synergies and create mutually beneficial opportunities. Whether through joint ventures, licensing agreements, or strategic alliances, manufacturers can leverage partnerships to broaden their reach, access new technologies, and penetrate new customer segments.
- **Adoption of digital technologies:** The advent of Industry 4.0 has revolutionized the manufacturing landscape, presenting manufacturers with opportunities to embrace digital technologies, such as IoT, AI, data analytics, and automation. By digitizing their operations, streamlining workflows, and responding swiftly to market demands, manufacturers can enhance operational efficiency, improve product quality, and gain a competitive edge in the market.
- **Technology transfer and IP:** Indian firms and foreign stakeholders stand to mutually benefit by facilitating access to cutting-edge technologies and intellectual property. While one party may possess strengths in IP, the other might offer capital and market familiarity, or vice versa – a trend increasingly observed in India’s rapidly expanding startup sector. Properly negotiated JVs, licensing agreements, and partnerships between domestic and foreign companies will foster the acquisition of new knowledge, skills, and technologies, thereby enhancing productivity and competitiveness. Moreover, such collaboration can broaden the Indian entity’s exposure to the global capital market while refining its business model to become more sophisticated.
- **Embracing sustainability in operations:** Sustainability has emerged as a key driver of consumer preferences and regulatory policies

globally. Indian manufacturers can distinguish themselves by embracing environmentally friendly practices across their value chain, from sourcing raw materials to product packaging. By adopting energy-efficient technologies, recycling waste materials, and minimizing carbon emissions, manufacturers can enhance their brand reputation, attract environmentally conscious consumers, and comply with evolving regulatory standards. At present, several countries, including Germany, France, the UK, and the Netherlands, Spain, Colombia, Uruguay, Chile, among others, have a carbon tax mechanism in place. Moreover, the European Union (EU) has issued several policies to ensure sustainable trading activities within the European market, including the EU Action Plan for the Circular Economy, the EU Biodiversity Strategy for 2030, and the Carbon Border Adjustment Mechanism (CBAM). Foreign firms with India suppliers or Indian companies selling to foreign markets, such as the EU, will need to meet their environment, social, and governance (ESG) standards.

- **Enhancing supply chain efficiency:** A robust and efficient supply chain is indispensable for meeting customer expectations, reducing costs, and maintaining a competitive edge. Manufacturers can optimize their supply chain network by identifying bottlenecks, streamlining processes, and leveraging digital solutions such as supply chain analytics and real-time tracking. By enhancing supply chain efficiency, manufacturers can improve inventory management, reduce lead times, and ensure seamless coordination with suppliers and distributors.

Regulatory and legal considerations for manufacturing operations

Deciding where to go in India carries as much weight as the decision to enter the country itself. Certain states offer more conducive environments for investors and investments, while others have emerged as focal points for specific industries, such as Tamil Nadu's prominence in the electronics and automobile sectors. It's crucial to evaluate whether the chosen location presents any distinct risks or advantages. Further, if the manufacturing operation is in a polluting industry, the investor will need to secure various environmental clearances.

Key legal considerations before investing in India's manufacturing sector include the following:

- **Location selection:** Choosing a location based on various criteria such as business-friendly policies, incentives, infrastructure, availability of skilled labor, proximity to ports and markets, etc., is crucial. Most Indian states offer incentives like land discounts or parcels in industrial parks, stamp duty rebates, tax breaks, and single window clearance. However, the approval process varies across states due to differences in systems of bureaucracy and documentation compliance.
- **Land acquisition:** Clear title and access to land free from mortgage and litigation is critical. Industrial parks and SEZs offer ready-to-use land, but private land acquisition requires conversion to industrial use, which involves compliance with local laws. It is advisable to lease or buy land in industrial parks.
- **Due diligence:** Conducting thorough due diligence is essential – whether scoping potential suppliers, partners for business matchmaking, or starting a joint venture. Proper documentation, compliance with regulations, and no pending legal actions are important to ensure.
- **Environmental compliance:** If the factory intends to use hazardous substances, or its output is polluting, additional documentation and approvals will be necessary, potentially lengthening the registration process.
- **Compliance with Factories Act:** Understanding and adhering to the Factories Act, 1948, which applies to manufacturing units with specific worker thresholds, is mandatory. Obtaining factory licenses and pre-construction approvals are part of the compliance process.
- **Employee regulations:** Compliance with labor laws and regulations regarding the hiring of skilled, semi-skilled, or unskilled labor is necessary. Employers must procure registrations and licenses based on the number of employees and their occupational classification.
- **Importing equipment:** Clearances from customs authorities are required for importing technology or equipment. Proper agreements related to financing and importation need to be in place.
- **Ongoing compliances:** After construction and equipment installation, ongoing compliance with the Factories Act and labor regulations is mandatory. Health and safety standards for workers, as well as public display of notices, must be maintained. Many states have streamlined certain compliances through digital governance, but there continues to be periodic factory visits and onsite inspections by government officers to certify that all compliances are being met.

- **Responsibility of designated 'occupier':** The individual identified as the 'occupier' in the registration application, typically a manager or director of the company, bears responsibility for ensuring factory compliance with the requirements outlined in the Factories Act, labor laws, and other essential standards regarding health, safety, amenities for workers, and timely payments. It is advisable to appoint a manager or director familiar with local compliance nuances to serve as the designated occupier.

FDI restrictions

The Indian government has been closely scrutinizing foreign direct investment (FDI) proposals originating from bordering countries, especially since April 2020. These proposals, totaling INR 1 trillion, have predominantly targeted sectors such as heavy machinery, automobile manufacturing, auto components, computer software and hardware, trading, e-commerce, as well as light engineering and electricals.

However, only around 50 percent of these proposals have received clearance from the government, with the remainder—a significant figure—either withdrawn or rejected according to official sources cited by the media in December 2023. Currently, pending applications are under review by security agencies and relevant ministries.

Notably, in a separate development, China's largest automaker SAIC entered into a joint venture with the JSW Group to bolster MG Motor's presence and growth in the Indian market. The overarching emphasis remains on evaluating the strategic importance and potential ramifications of FDI inflows from bordering nations on India's economic and security interests.

Summary

The path to expansion for Indian manufacturers necessitates a strategic approach and a willingness to embrace innovation and adaptability. By diversifying into new markets, forging strategic partnerships, adopting digital technologies, embracing sustainable practices, and enhancing supply chain efficiency, manufacturers can unlock new growth opportunities and better position themselves for sustained success in the global marketplace, especially in the face of supply chain shocks, geopolitical pressures, and black swan events. As firms navigate the complexities of expansion, manufacturers must remain agile, proactive, and committed to delivering value to their customers and stakeholders.

In the pursuit of growth, manufacturers in India can not only expand their market reach through forging alliances with international partners, but also contribute to the nation's economic development and competitiveness on the global stage. By embracing expansion strategies, Indian manufacturers can chart a course toward sustainable growth and prosperity in the years to come. 🇮🇳



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Futuristic Industries, Sustainability, and the Manufacturing Sector

Companies can enhance the power of 'Make in India' through the adoption of Industry 4.0 technologies to boost manufacturing output, mitigate carbon emissions, and implement sustainable practices, which in turn will entice more foreign investors.



Melissa Cyrill
Deputy Managing Editor
Asia Briefing
Co-Author



Archana Rao
Business Editor
India Briefing
Co-Author

India has strategically embraced technological advancements in various sectors, including manufacturing, to ensure efficiency and future relevance. The country has also moved up the rankings of the Global Innovation Index (GII), from a rank of 81 in 2015 to 40 in 2023.

As India seeks to transition to Industry 4.0, its manufacturing sector is having to consider five key trends: adoption of advanced technologies and Internet of Things (IoT), talent management strategies, supply assurance policies, holistic smart factory initiatives, and a focus on corporate social responsibility.

Indian factories in certain segments have invested in robots, such as Epson's SCARA and 6-Axis robots. High-precision robots and automation technology cater to a diverse spectrum of industries, including manufacturing, automotive, F&B, battery production, packaging, pharmaceuticals, and logistics, and help to ensure adherence to global quality standards.

Currently, India's top conglomerates and high-tech startups are leading the country's advancements in futuristic industries and their applications. In addition to innovation and higher productivity, a focus on sustainability and mitigating carbon emissions are other considerations for Indian manufacturers embracing new technologies. Given India's manufacturing ambitions and the desire to get integrated into global value chains, the government is simultaneously working on strategies to attract investments from multinational companies.

Emerging technologies and their applications in manufacturing

The manufacturing sector is undergoing significant transformations. We discuss some of the key emerging technologies that promise enhanced operational resilience, productivity, and sustainability across various industries in India. Companies that are able to adopt them into their growth strategies and production lines will

become more competitive and align better with the evolving regulatory landscape.

1. Digitization: Manufacturing is embracing digitization to modernize processes, reduce errors, and improve decision-making with real-time analytics. Technologies like AI, cloud computing, and 3D printing are being adopted to enhance competitiveness and operational efficiency. Leading Indian firms in this domain include Tata Consultancy Services (TCS) and Infosys. Tata Elxsi Ltd is a prominent AI solutions provider – offering design and technology services for the automotive, broadcast, communications, healthcare, and transportation industries.

2. Automation and robotics: Automation is improving speed, efficiency, and precision in manufacturing. Robots handle repetitive tasks, while collaborative robots (“cobots”) work alongside humans for more dangerous operations, leading to increased output rates and reduced labor costs. Wipro PARI, Simelabs, ABB, and Hi-tech Robotics are some of the leading robotics companies in India.

3. 4D and 3D printing: Three-dimensional (3D) printing applications are found to lower supply chain costs, construction waste, and carbon footprints. The 3D innovation space is currently dominated by the US and Europe. The process by which a 3D printed object transforms into another structure due to external energy input is known as 4D printing. This external energy can take various forms such as temperature, light, or other forces. Industries including aerospace, automotive, clothing, construction, healthcare, and others are actively exploring the potential applications of 4D printing technology. ABB Robotics, Simpliforge, and Kelvin6k are examples of additive manufacturing (AM) companies

making advances in the Indian construction sector.

4. Augmented reality (AR): AR is streamlining workflows, boosting productivity, and cutting operational costs in manufacturing. ‘Smart glasses’ empower workers to perform tasks with increased efficiency and accuracy.

5. Digital Twin: Digital Twins replicate physical assets and processes digitally, providing insights into performance and enabling predictive maintenance, contributing to smarter and more efficient manufacturing processes.

6. Advanced Materials: Innovations in nanotechnology, composites, and smart materials are revolutionizing industries by creating lighter, stronger, and more sustainable products with enhanced performance and durability. There are over 80 Advanced Materials startups in India, including Zerocircle, Lucro, Canvaloop, Sigachi, Phillips Carbon Black, Epilson Carbon, Raphe mPhibr, Nanospan, EnviGreen, Sidwin Fabrics, etc.

7. Sustainable manufacturing: Businesses are adopting eco-friendly production processes, resource-efficient technologies, and circular economy principles to minimize waste and energy consumption. Modern technologies like automation, AI, and advanced sensors play a crucial role in advancing sustainable manufacturing practices.

India’s semiconductor manufacturing ambitions

India is strategically positioning itself in the global semiconductor market, aiming for economic growth and technological advancement. The Indian semiconductor market, valued at US\$30 billion



India's Most Sustainable Companies (Sustain Labs Paris Report, 2023).

Godrej Consumer Products, Tech Mahindra, HDFC Limited, Wipro, Tata Consumer Products, Cipla, Marico, Hindustan Unilever, Tata Consultancy Services, Dr. Reddy's Laboratories, HCL Tech, Infosys, Tata Communications, Maruti Suzuki India, UltraTech Cement, Bharti Airtel, Asian Paints, Glenmark Pharmaceuticals, Tata Chemicals, Larsen & Toubro, Welspun India, Ambuja Cements, Tata Power Company, Reliance Industries Limited, and Tata Steel.

in 2023, is projected to reach US\$55 billion by 2026, with smartphones, automotive parts, and computing/data storage driving over 60 percent of this growth. The Indian government has approved the establishment four facilities under its flagship semiconductor program:

- a. Micron Technology's advanced semiconductor assembly and testing facility in Sanand, Gujarat;
- b. Semiconductor fab in Dholera, Gujarat set up by Tata Electronics Private Limited (TEPL) and Taiwan's Powerchip Semiconductor Manufacturing Corp (PSMC);
- c. Semiconductor ATMP unit set up by Tata Semiconductor Assembly and Test Pvt Ltd (TSAT) in Morigaon, Assam; and
- d. Semiconductor ATMP unit set up by CG Power, in partnership with Renesas Electronics Corporation, Japan, and Stars Microelectronics, Thailand in Sanand, Gujarat.

The semiconductor schemes in India are as follows:

- **Scheme for setting up of Semiconductor Fabs in India:** Fiscal support of 50 percent of project

cost on a pari-passu basis for all technology nodes will be provided under the Scheme by the central government. State incentives will be in addition to this, depending on the location of the investment.

- **Scheme for setting up of Display Fabs in India:** Fiscal support of 50 percent of project cost on a pari-passu basis will be provided under the Scheme by the central government. State incentives will be in addition to this.
- **Scheme for setting up of Compound Semiconductors / Silicon Photonics / Sensors Fab and Semiconductor Assembly, Testing, Marking and Packaging (ATMP) / OSAT facilities in India:** Fiscal support of 50 percent of capital expenditure on a pari-passu basis will be provided under the Scheme by the central government. State incentives will be in addition to this.
- **Design Linked Incentive (DLI) Scheme:** The Centre for Development of Advanced Computing (C-DAC), operating under the Ministry of Electronics and Information (MeitY), will steer the implementation of the DLI scheme.

a. Chip Design Infrastructure Support:

C-DAC will establish the India Chip Centre to host cutting-edge design infrastructure, including Electronic Design Automation (EDA) Tools, IP Cores, and support for Multi-Project Wafer (MPW) fabrication and post-silicon validation. This infrastructure will be made accessible to supported companies

b. Product Design Linked Incentive:

Approved applicants engaged in semiconductor design will receive reimbursement of up to 50 percent of eligible expenditure, with a ceiling of INR 150 million (approximately US\$1.80 million) per application, as fiscal support.

c. Deployment Linked Incentive:

Approved

applicants deploying semiconductor designs for Integrated Circuits (ICs), Chipsets, System on Chips (SoCs), Systems & IP Cores, and semiconductor-linked designs in electronic products will receive an incentive of 4-6 percent of net sales turnover over 5 years, capped at INR 300 million (approximately US\$3.61 million) per application.

Sustainable manufacturing practices and environmental considerations

Businesses worldwide are under increasing pressure to reduce carbon emissions and mitigate their environmental impact. It is imperative for industries with substantial emission outputs to take proactive measures to minimize their carbon footprint. Key factors that support companies in becoming more environmentally conscious include:

- 1. Energy efficiency:** Employing techniques and systems that progressively reduce carbon emissions and energy consumption.
- 2. Circular economy strategy:** Implementing strategies to minimize waste and recycle materials back into the production process, thus reducing overall waste generation.
- 3. Use of sustainable materials:** Prioritizing the use of recycled and environmentally friendly raw materials throughout the production process.

Environmentally friendly practices offer a competitive advantage, while incidents harming the environment may lead to loss of clients and cause reputational damage. Moreover, sustainability initiatives prove economically viable by reducing waste and optimizing resource use, resulting in cost savings and improved profit margins. Sustainable factories are better positioned to meet industry standards, reducing the need for costly audits.

Additionally, an efficient supply chain enhances a manufacturing enterprise's public image, shortens delivery times, improves reliability, and enables better forecasting, leading to cost savings by avoiding overproduction.

Business strategies in the era of carbon tax policies

As the global focus on sustainability intensifies, it's imperative for businesses to understand and adapt to evolving global policies. Below are some key considerations and recommendations:

- Understanding carbon tax implications:** Carbon taxes are becoming increasingly common worldwide as governments seek to mitigate climate change. These taxes incentivize businesses to invest in carbon reduction technologies and adopt sustainable practices. It's crucial for your business to understand the implications of carbon taxes on your operations and bottom line. Some countries implementing carbon tax measures include Sweden (US\$137/CO₂metric ton), Switzerland (US\$101/CO₂metric ton), Liechtenstein (US\$101/CO₂metric ton), Norway (US\$69/CO₂metric ton), Finland (US\$62/CO₂metric ton), and France (US\$52/CO₂metric ton).
- Investing in carbon reduction technology and remanufacturing:** Numerous studies indicate that production modes used in the manufacturing sector are key contributors to both the excessive consumption of resources and energy and the accumulation of waste products, making the sector one of the largest global sources of environmental pollution. Investing in emission reduction technologies not only directly decreases carbon emissions but also meets the demands of end consumers for low-carbon footprint products. Remanufacturing is also an



India Updates Ecomark Scheme to Boost Eco-Friendly Choices

In an effort to promote sustainable living and environmental conservation, the Ministry of Environment, Forest, and Climate Change (MoEF&CC) has overhauled its Ecomark notification, aimed at encouraging eco-friendliness in design and production processes. The revised Ecomark Scheme, officially announced on October 13, 2023, introduces accreditation and labeling for household and consumer products. These products must meet specific environmental criteria while adhering to quality standards in accordance with Indian norms.

Products accredited under the Ecomark Scheme will adhere to stringent environmental criteria, ensuring minimal environmental impact throughout their lifecycle. The initiative aims to incentivize manufacturers to transition towards environmentally friendly production methods.

Administered by the Central Pollution Control Board in collaboration with the Bureau of Indian Standards (BIS), the Ecomark Scheme represents a significant stride towards fostering individual and collective choices that embrace eco-friendly practices in India.

The government envisions India's circular bioeconomy reaching US\$300 billion by 2030, through advancements in high-performance bio-manufacturing.

effective approach to recycling waste resources and transforming production into a low-carbon approach. Consider exploring these avenues to reduce your carbon footprint while remaining competitive in your industry.

- **Tailoring tax policies to industry needs:** Different industries have unique challenges and requirements when it comes to carbon emissions. Tailored carbon tax policies, including tax reliefs, returns, and emissions reduction agreements, can help address these challenges effectively. Advocate for policies that are specific to your industry's needs.
- **Preparing for global carbon emissions policies:** While the European Union (EU) spearheads policy implementation, impacting global export-oriented manufacturing, several countries like Brazil, Brunei, Indonesia, Thailand, Turkey, and Vietnam are poised to adopt carbon tax measures in the near future. These nations recognize the necessity of domestic initiatives to ensure global competitiveness and avoid higher costs in the export market. Stay abreast of global carbon tax trends and ready your business to adhere to new regulations while capitalizing on emerging opportunities.



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- **Embracing sustainable practices:** Sustainability is no longer just a buzzword—it's a business imperative. Embrace sustainable practices throughout your operations, from supply chain management to product design and manufacturing. Engage in strategic partnerships within your supply chains to foster a collaborative approach to sustainability.
- **Adapting to market forces:** A carbon tax sends price signals that allow market forces to determine the best ways to reduce emissions. Be proactive in adapting to these market forces by developing tailored solutions that align with your business operations, innovations, and investment strategies.

EU carbon tax program

The EU's Carbon Border Adjustment Mechanism (CBAM) came into effect on October 1, 2023, initiating the transitional phase lasting until December 31, 2025. During this period, importers are obligated to:

1. Register in the provisional CBAM register.
2. Calculate embedded emissions in imported goods using CBAM-Regulation methods.
3. Document and report calculated emissions quarterly without requiring financial compensation. Companies in seven carbon-intensive sectors, including steel, cement, fertiliser, aluminium, and hydrocarbon products, will have to share data regarding carbon emissions with the EU.

Starting January 1, 2026, the permanent CBAM system will be fully enforced, imposing extensive obligations:

1. Importers must apply for authorized CBAM declarant status.
2. Embedded emissions require verification by an accredited auditor.
3. Purchase CBAM certificates for a fee, calculated

based on the weekly average auction price of EU ETS allowances.

4. Submit an annual CBAM declaration by May 31, reporting on the previous year's imported goods and corresponding CBAM certificates.
5. Gradual reduction and offset of free allocations by CBAM certificates will replace the existing EU Emission Trading System by 2034.

EU importers were required to submit their first CBAM report by January 31, 2024, detailing embedded emissions in goods imported during the initial quarter of CBAM application (October 1, 2023 - December 31, 2023).

According to a report by the think tank Global Trade Research Initiative (GTRI), the CBAM is anticipated to result in a 20-35 percent tax on imports of electricity, aluminum, cement, fertilizers, hydrogen, iron, and steel into the EU. Notably, India's exports of iron ore pellets, iron, steel, and aluminium products constitute 26.6 percent of its total exports to the EU and were valued at US\$7.4 billion in 2023. 🇮🇳



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Our Offices in India

Delhi

+91 0124 4001785
delhi@dezshira.com

Unit No. 1101-A, 11th Floor,
Emaar Capital Tower 2, MG Road,
Near Guru-Dronacharya Metro Station
Gurugram-122002, Haryana, India

Mumbai

+91 22 6239 6004
mumbai@dezshira.com

Unit No. 405/A, B Wing, Kanakia Wall Street,
Andheri Kurla Road, Andheri (East),
Mumbai 400093, India

Bengaluru

+91 80 6185 2024
bengaluru@dezshira.com

Supreme Overseas Exports Building,
1st and 2nd Floor, Jayanagar, 7th Block,
KR Road, Bengaluru, Karnataka 560070, India



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