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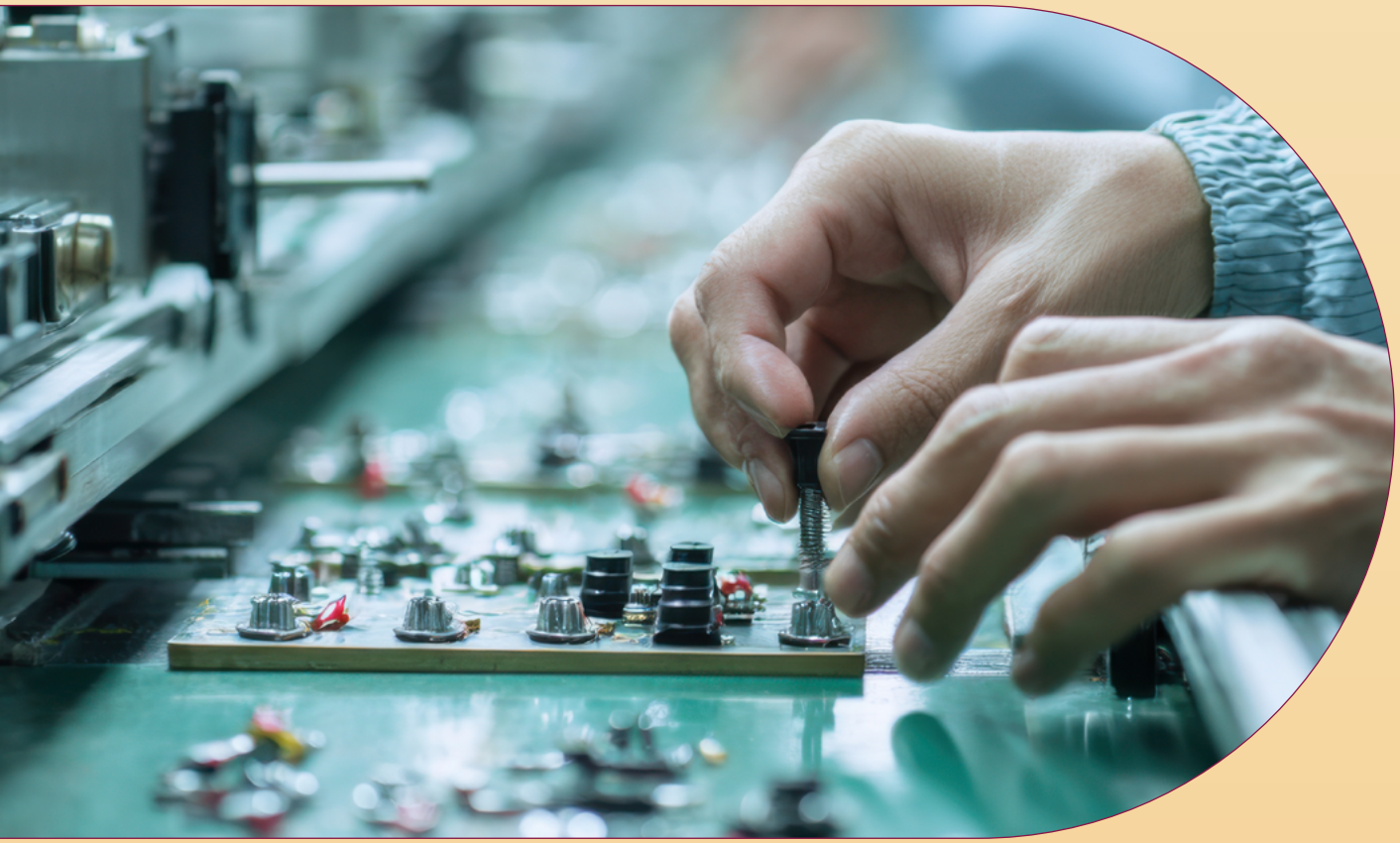
Cleantech Manufacturing Readiness Across States in India

Building the sub-national foundation for India's National Manufacturing Mission

AUGUST 2026



The Bharat Climate Forum (BCF) was launched in 2025 as a national platform co-anchored by the Council for International Economic Understanding (CIEU) and Dalberg Advisors to align India's climate ambitions with core economic priorities. Set up to turn climate commitments into national competitiveness, job creation and technological leadership, the Forum unites leaders across government, industry, finance, academia and civil society around a shared Make in India strategy for clean technologies. Building on its inaugural convening, the BCF serves as a practical mechanism to turn high-level policy dialogue into real execution.

A primary milestone of this effort was the launch of the Blueprint for India's Cleantech Manufacturing Ambition, which synthesized multi-stakeholder insights across six priority value chains: solar photovoltaics, wind energy, battery energy storage, electric mobility, green hydrogen, and high voltage transmission. The Blueprint set out a roadmap to target 50% domestic value addition by 2030 across all the six value chains, highlighting critical priorities across demand architecture, R&D, critical raw materials, capital equipment, skilling, and financing. By addressing key supply chain bottlenecks and targeted interventions, it emphasized the national focus needed on deep industrial value creation.

Building on the national foundation, this assessment extends the diagnostic directly to the subnational level. While national policy sets overarching direction, actual project execution depends on state level readiness, infrastructure, operating conditions and local governance. Accordingly, this study examines the competitiveness of ten leading Indian states to evaluate their readiness to anchor cleantech investments and power India's ambition for industrial transformation and clean energy transition

India's Manufacturing Ambition in the Clean Energy Transition

The global race to build clean energy supply chains has made cleantech manufacturing a strategic industrial priority. As countries seek to strengthen energy security, diversify supply chains and capture the economic opportunities of energy transition, manufacturing capabilities in sectors such as solar photovoltaics, batteries, wind, green hydrogen and grid technologies have become central to long-term competitiveness. For India, this presents a significant opportunity to leverage its growing domestic market , expanding industrial base and skilled workforce to emerge as a globally competitive manufacturing hub.

Recognizing this opportunity, the Government of India has placed advanced manufacturing at the center of its industrial strategy through initiatives such as the Production Linked Incentive (PLI) schemes and the National Manufacturing Mission, which aim to strengthen domestic manufacturing ecosystems, deepen supply chains, reduce import dependence and position India as a trusted global manufacturing partner.

Realizing this ambition, however, depends as much on state-level competitiveness as on national policy. While the National Manufacturing Mission provides the strategic direction, manufacturing investments are ultimately shaped by factors under the control of state governments, including industrial land, infrastructure, logistics, electricity costs, approvals, skilled labor and local incentive frameworks.

This assessment examines the readiness of ten leading Indian states to support cleantech manufacturing investments across five dimensions: policy and institutional support, infrastructure and logistics, manufacturing ecosystems, fiscal incentives, and operating conditions. The result highlights the differentiated capabilities emerging across states and the distinct roles they can play within India's evolving cleantech manufacturing landscape.

Manufacturing Competitiveness Is Becoming Increasingly Differentiated Across States

The assessment indicates that manufacturing competitiveness is increasingly shaped by the quality of industrial ecosystems rather than by fiscal incentives alone. Infrastructure, logistics and supply-chain integration have become fundamental differentiators. Coastal states such as Gujarat, Tamil Nadu, Andhra Pradesh and Odisha benefit from integrated industrial corridors, deep-water ports and established manufacturing clusters that support export-oriented production, while inland states are leveraging freight corridors, industrial parks and domestic market access to strengthen their competitiveness.

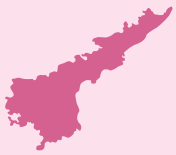
Gujarat and Tamil Nadu emerge as India's most comprehensive cleantech manufacturing destinations, combining mature industrial ecosystems, sector-specific clusters and deep supplier networks. At the same time, Andhra Pradesh and Odisha are rapidly emerging as attractive locations for large-scale manufacturing investments, leveraging port connectivity, industrial land and proximity to critical minerals and heavy industry. Rather than replicating existing manufacturing hubs, these states are developing distinct competitive advantages across different segments of the cleantech value chain.

Other states are differentiating themselves through specialized capabilities. Karnataka's advanced engineering ecosystem, research institutions and skilled workforce position it strongly as a hub for higher-value manufacturing. Telangana has established itself as a leader in investment facilitation through streamlined approvals, demonstrating that administrative efficiency is becoming an increasingly important determinant of investment decisions alongside traditional fiscal incentives.

Operating costs are emerging as an increasingly important determinant of investment decisions, particularly for energy-intensive manufacturing. Several states have begun using electricity-related incentives to improve competitiveness. Madhya Pradesh offers some of the strongest long-term reductions in operating costs through electricity duty and energy cess exemptions. Maharashtra has developed attractive open-access and transmission incentives for green hydrogen, while Gujarat and Tamil Nadu also provide substantial fiscal support for industrial power consumption. As manufacturing scales across batteries, electrolyzers and other electricity-intensive technologies, access to affordable and reliable power is likely to become an even more important location advantage.

Despite encouraging progress, most states still lack integrated cleantech manufacturing frameworks. In many cases, incentives remain dispersed across separate industrial, renewable energy, electric mobility and hydrogen policies, creating complexity for investors evaluating multi-technology manufacturing opportunities. Only a limited number of states currently offer cohesive, sector-specific manufacturing ecosystems that integrate infrastructure, policy support, industrial clusters and supply-chain development.

The table below summarizes the comparative strengths, strategic differentiators and remaining bottlenecks across the ten states assessed:

State	Manufacturing Strengths	Strategic Position	Key Constraints
Andhra Pradesh 	• Large industrial land bank of ~44,000 acres with plug-and-play infrastructure through APIIC industrial parks. • Strong port-led manufacturing ecosystem with access to Visakhapatnam, Gangavaram, Kakinada, and Krishnapatnam ports. • Integrated Clean Energy Policy 2024 and EV Policy 4.0 provide targeted incentives including up to 25% capital subsidy and priority land allotment for renewable energy manufacturing.	• Well positioned as an export-oriented manufacturing hub due to extensive port infrastructure and the Visakhapatnam–Chennai Industrial Corridor. • Particularly attractive for large-scale manufacturing requiring logistics connectivity, industrial land and access to global markets.	• Cleantech incentives remain fragmented across multiple sectoral policies rather than a unified manufacturing framework. • Coastal industrial zones face exposure to cyclone and flood risks, increasing infrastructure resilience requirements.
Karnataka 	• Mature, advanced manufacturing ecosystem with over 400 renewable energy and engineering companies. • Strong innovation and talent base supported by Bengaluru's electronics, automotive, and technology industries. • Strategic positioning along both the Chennai–Bengaluru and Bengaluru–Mumbai Industrial Corridors.	• India's leading location for innovation-driven and high-value manufacturing, particularly power electronics, advanced battery systems and precision engineering. • Well suited for technology-intensive manufacturing requiring strong R&D capabilities and skilled talent.	• Cleantech support is spread across multiple policies rather than a dedicated manufacturing framework. • Higher industrial land and operating costs may constrain large-scale manufacturing investments.
Odisha 	• Large industrial land availability (~9,000 hectares) supported by established industrial estates and SEZs. • Strong heavy-industry ecosystem anchored by Paradip Port, mineral resources, and metallurgical manufacturing clusters. • Attractive capital subsidies and large-scale investment support under industrial promotion policies.	• Natural hub for upstream cleantech manufacturing built around metals, steel, chemicals and mineral resources. • Particularly well positioned for solar glass, structural components, battery materials and green hydrogen supply chains.	• Limited dedicated cleantech manufacturing clusters despite strong industrial infrastructure. • Downstream manufacturing and advanced engineering ecosystems remain less developed.
Uttar Pradesh 	• Extensive industrial land bank across 155 industrial areas with additional land available through the Defence Corridor . • Strong connectivity through expressways, Dedicated Freight Corridor infrastructure, and upcoming multimodal logistics hubs. • Large domestic market and workforce supporting downstream manufacturing demand.	• Well positioned for downstream manufacturing serving India's domestic market, including EV assembly, power equipment and electrical components. • Strategic gateway to northern demand centers.	• Cleantech incentives remain fragmented across multiple sectoral policies. • Landlocked geography increases logistics costs for export-oriented manufacturing.

State	Manufacturing Strengths	Strategic Position	Key Constraints
Gujarat 	• 5 highly specialized, operational cleantech clusters offer value-chain consolidation. • Immediate access to co-located ecosystems such as Dholera SIR (solar componentry and Li-ion lines), Mandal-Bechraji SIR (EV automotive manufacturing), and PCPIR Dahej (battery chemicals). • Khavda Renewable Energy Park creates predictable domestic demand for localized component manufacturing.	• India's most mature integrated cleantech manufacturing ecosystem, combining upstream materials, component manufacturing and export infrastructure. • Particularly attractive for investors seeking execution-ready industrial ecosystems with strong supply-chain integration.	• Continued industrial expansion will require sustained investment in utility infrastructure. • Long-term competitiveness will depend on managing grid capacity and water availability as manufacturing scales.
Tamil Nadu 	• Aggressive fiscal incentives designed for EV and ACC manufacturing. • 100% electricity tax exemption and full SGST reimbursement until 2030. • 15% capital subsidy for EV/component players and land subsidies ranging from 15%–50% in southern districts.	• Leading hub for downstream advanced manufacturing, EVs, batteries and automotive supply chains. • Particularly attractive for integrated assembly and component manufacturing supported by a mature industrial ecosystem.	• Greater integration of cleantech manufacturing policies beyond individual sectors could improve investor certainty. • Faster approval processes for broader cleantech manufacturing could further strengthen competitiveness.
Madhya Pradesh 	• Strongest structural opex insulation in central India for energy-intensive manufacturing. • 100% exemption from electricity duty and energy development cess for ten years. • 50% wheeling charge waiver and reliable industrial water access from the Narmada basin.	• Attractive destination for energy-intensive manufacturing where long-term operating costs are a key investment driver. • Well suited for manufacturers prioritizing competitive electricity costs and central market access.	• Investment facilitation remains largely cross-sector rather than tailored to cleantech manufacturing. • Faster approval mechanisms could improve competitiveness for time-sensitive investments.
Rajasthan 	• 75% upfront exemption and 25% reimbursement on stamp duty and land conversion charges. • Over 58% of industrial areas are within the Delhi-Mumbai Industrial Corridor (DMIC). • Strong industrial demand driven by assets such as Bhadla Solar Park.	• Well positioned for land-intensive manufacturing such as solar ingots, wafers and wind components. • Combines abundant renewable energy resources with large industrial land availability.	• Water scarcity presents a long-term constraint for water-intensive manufacturing and will require greater investment in recycling and zero-liquid-discharge systems.
Telangana 	• TG-IPASS guarantees industrial approvals within 30 days. • Mature plug-and-play clusters at Zaheerabad (EVs) and Divitipally (energy storage systems). • Mega enterprises receive 100% SGST reimbursement capped at INR 5 crores annually for seven years.	• Differentiates itself through administrative efficiency and rapid investment facilitation. • Particularly attractive for manufacturers prioritizing speed-to-market and lower project implementation risks.	• Capital subsidy limits may reduce competitiveness for giga-scale manufacturing investments relative to larger industrial states.

State	Manufacturing Strengths	Strategic Position	Key Constraints
Maharashtra 	• Strong open-access and tariff incentives tailored for green hydrogen and green ammonia. • 100% exemption from cross-subsidy surcharge (CSS) and additional surcharge (AS). • 50%–60% transmission and wheeling charge exemptions for renewable-powered facilities over ten years.	• Leading destination for green hydrogen and other electricity-intensive manufacturing requiring long-term access to competitive renewable power. • Particularly well positioned for emerging hydrogen value chains.	• Cleantech manufacturing incentives remain concentrated in a limited number of sectors without an integrated cleantech manufacturing strategy.

Implications for the National Manufacturing Mission

The comparative assessment demonstrates that India's long-term manufacturing competitiveness will depend on leveraging these complementary regional strengths. Different states are naturally positioned to specialize in different segments of the cleantech value chain, reflecting variations in industrial capabilities, resource endowments, infrastructure and market access. Recognizing and strengthening these complementary roles can help build more resilient domestic supply chains while improving India's attractiveness as a global manufacturing destination.

Aligning the National Manufacturing Mission with differentiated state capabilities will therefore be critical to accelerating investment, reducing supply-chain fragmentation and strengthening India's position in global clean energy manufacturing. A coordinated approach that combines national industrial priorities with state-level competitive advantages can enable India to develop integrated manufacturing ecosystems capable of supporting both domestic deployment and export-oriented growth.

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