Entry strategies and ecosystem adaptation for Taiwanese component/PC firms

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INTRODUCTION

Taiwanese component and PC firms aiming to enter the Indian market must carefully navigate key aspects of the local business environment. Optimal entry approaches typically involve joint ventures, collaborations with local partners, or establishing direct manufacturing and assembly operations to benefit from cost efficiencies and market access. Adapting effectively to the ecosystem entails integrating with domestic suppliers, complying with standards and certification norms, leveraging government incentives, and developing skilled local talent.

1. **Regulatory & incentive landscape for electronics manufacturing in India**

   India's electronics manufacturing sector operates within a structured regulatory and incentive framework designed to boost domestic production and exports. Key elements include compliance with BIS standards, product certification schemes, and government-backed financial incentives like the PLI Scheme, SPECS, and EMC 2.0. Combined with skill development, supplier support programs, and trade facilitation measures, this ecosystem aims to strengthen local supply chains and enhance India's global competitiveness.

2. **Bureau of Indian Standards (BIS) — Compulsory Registration Scheme (CRS)**

   The Compulsory Registration Scheme (CRS), managed by the Bureau of Indian Standards (BIS) under MeitY's *"Electronics and IT Goods (Requirements for Compulsory Registration) Order"*, mandates that each product model and manufacturing location obtain a unique BIS registration number to verify compliance with Indian Standards for safety, electromagnetic compatibility, and quality. The CRS currently covers over 75 product categories, including laptops, tablets, power adapters, LED lighting, power banks, and mobile phones. *(Source: BIS CRS Portal, MeitY Notification)* https://www.crsbis.in/BIS/publicdashAction.do.

3. Manufacturers must test their products in a BIS-recognized Indian laboratory and apply online through the CRSBIS portal with supporting test reports and documentation. Upon approval, BIS issues a two-year renewable registration. Foreign manufacturers must

appoint an Authorized Indian Representative (AIR)—a legally registered Indian entity responsible for ensuring continued compliance under the BIS Act, 2016. *(Reference: BIS Grant of Licence Guidelines, 2024)* (https://www.bis.gov.in/wp-content/uploads/2024/09/GrantofLicence-Guidelines-27Sept2024.pdf)

4. **Environmental Compliance (EPR, Emissions, and Hazardous Materials)**
   Under the E-Waste (Management) Rules, 2022, electronics producers and importers must register with the CPCB, establish take-back and recycling systems, and obtain SPCB consents for air and water emissions. Compliance with RoHS limits on lead, cadmium, and mercury is also required. Foreign manufacturers should budget early for EPR logistics, recycler contracts, and CPCB registration to avoid launch delays.
   (MoEFCC E-Waste Rules 2022; CPCB EPR Portal — https://eprewastecpcb.in/)

5. **Labor and Social Compliance (Factories Act and New Labor Codes)**
   Manufacturing units must comply with the Factories Act, 1948, and emerging Labor Codes covering wages, safety, and social security. Key obligations include safe working conditions, regulated hours, and state-level permissions for female/night-shift workers. Foreign firms should align SOPs with state-specific labor rules and engage local HR/legal advisors to ensure compliance.
   (Ministry of Labour & Employment, Labour Codes Overview, 2023 — https://www.pib.gov.in/PressReleasePage.aspx?PRID=2147926&reg=3&lang=2)

6. **Intellectual Property & Technology Transfer Framework**

   A Taiwanese electronics company entering India should secure IP protection before manufacturing by filing patents through the Indian Patent Office or Patent Cooperation Treaty (PCT) national phase, registering trademarks (English and local scripts), and protecting firmware, designs, and documentation under the Copyright and Designs Acts. Technology should be transferred under Technology Collaboration or Toll Manufacturing Agreements with clear IP ownership, non-circumvention clauses, and, where needed, escrow arrangements for source code or process recipes, while maintaining split control of sensitive know-how. All royalty, licensing, and intercompany transactions must comply with India's transfer pricing laws under the Income Tax Act, 1961, benchmarked at arm's length, and documented through Master and Local Files, with disputes governed by neutral arbitration frameworks (e.g., SIAC or NDIAC) and IP enforcement strengthened via Customs IPR Recordation. (https://ipindia.gov.in/)

Recent Policy Changes (2024–2025) and Implications

1. **Production-Linked Incentive (PLI) – Large-Scale Electronics Manufacturing (LSEM)**

   Central PLI rules remain a primary driver (incentives of ~4–6% on incremental sales for target products), and in 2024–25 the government extended focus to more upstream components / sub-segments to reduce import dependence. This is the anchor programme for large manufacturers.

   - The Indian government approved ₹22,900 crore for a renewed PLI scheme (March 2025) to deepen component manufacturing beyond assembly.
   - As of FY 2024-25, 32 firms had qualified under the LSEM PLI with a committed investment of ₹11,324 crore, generating ₹10.7 lakh crore in production and over 3 lakh direct jobs.
   - Implication: Taiwanese OEM/ODM firms can qualify for 4%–6% incentive on incremental sales by setting up Indian subsidiaries or JVs; co-locating with approved anchor firms (Foxconn, Dixon, Wistron, etc.) enhances supply-chain integration.

     https://www.meity.gov.in/offerings/schemes-and-services/details/production-linked-incentive-scheme-pli-for-large-scale-electronics-manufacturing-gNyMDOtQWa

     https://www.thehansindia.com/business/pli-booster-32-firms-invest-rs-8282-crore-for-large-scale-electronics-manufacturing-894236

     https://economictimes.indiatimes.com/news/economy/policy/pli-schemes-attract-rs-1-76-lakh-cr-investment-create-12-lakh-jobs-govt/articleshow/122070850.cms

2. **Electronics Manufacturing Clusters (EMC 2.0) & Common Facility Centres (CFCs)**

   In 2025 the government announced fresh, structured incentives aimed specifically at electronics components (PCB, camera modules, laminates, certain passives), tying incentives to design, quality benchmarks and capital investment — signaling a shift from pure assembly to design-led local production.

   - As of 2025, 13 projects (11 EMCs + 2 CFCs) were approved covering 4,352 acres with total outlay of ₹5,226.55 crore, including ₹2,492.77 crore in central assistance.

- Clusters include locations in Tamil Nadu, Karnataka, Uttar Pradesh, and Telangana, with ready plug-and-play land, testing labs, and logistics linkages.
- Implication: Taiwanese firms entering India can reduce start-up time and cost by locating in EMC parks — access to shared infrastructure lowers capex by up to 15–20% and simplifies environmental and power clearances.

https://kpmg.com/in/en/blogs/2025/05/from-assemblers-to-innovators-indias-22919-cr-push-to-dominate-electronics-components.html

https://emc2.stpi.in/?utm

3. **India Semiconductor Mission (ISM)**

The Scheme for Setting up of Semiconductor Fabs in India under the India Semiconductor Mission) provides fiscal support of up to 50% of the project cost on a pari-passu basis for approved semiconductor fabrication plants, according to official releases from the Press Information Bureau, ism.gov.in, and uatism.semiconindia.org.

- The scheme also extends this up to 50% capital support to downstream packaging and testing facilities, including those for compound semiconductors, silicon photonics, sensors, and ATMP/OSAT units, indicating India's intent to develop a comprehensive semiconductor ecosystem beyond basic assembly (Press Information Bureau; ism.gov.in).
- Implication: With India's semiconductor market valued at approximately US $38 billion in 2023 and projected to reach US $45–50 billion by 2025 (India Briefing), Taiwanese component, packaging, and OSAT specialists are well positioned to establish joint ventures or greenfield investments in India, leveraging the ~50% fiscal subsidy to reduce capital expenditure and integrate into India's expanding semiconductor value chain.

4. **Customs / tariff simplification and selective exemptions (Budget 2024–25 / 2025)**

- The Union Budget 2024–25 and subsequent tariff notifications in 2025 simplified India's customs structure by reducing and rationalizing import duty slabs while introducing targeted exemptions on critical inputs such as lithium-ion battery parts, semiconductor materials, and key minerals used in strategic manufacturing (Ministry of Finance, Budget Documents 2024–25).

- These measures are designed to lower input costs and enhance competitiveness in electronics and EV supply chains while retaining protective duties on finished goods to encourage local value addition.
- Implication: Component, PCB, and semiconductor companies from Taiwan can benefit from reduced import costs on raw materials and equipment, but must monitor reclassifications of HS codes and align sourcing and production plans to comply with India's evolving tariff structure and maximize cost advantages.

  https://www.cbic.gov.in/

  https://www.pib.gov.in/PressReleasePage.aspx?PRID=2003546&reg=3&lang=2

Comparison of incentives across states

Category	Karnataka	Odisha	Madhya Pradesh	Telangana	Gujarat	Uttar Pradesh	Tamil Nadu
Patent Registration Incentive	Domestic: ₹2L; International: ₹10L; Max 5 per company	Domestic: ₹5L; International: ₹10L; 75% on filing, 25% on grant	Domestic: ₹5L; International: ₹10L	100% cost reimbursement, up to ₹5L	—	Domestic: ₹5L; International: ₹10L (based on actuals)	Not specifically mentioned; general industrial focus
Marketing Incentive	Up to ₹5L; 2 times per year	—	50% subsidy; Max ₹2L (international), ₹1L (national); available once yearly for 3 years	—	—	—	—
Quality Certification Reimbursement	50% or max ₹10L	—	50% up to ₹6L; once per certification	—	—	—	—
R&D Grant / Innovation Support	Startups (<7 yrs): Up to ₹2 Cr, twice during policy period	50% of project cost up to ₹5 Cr over 5 years; ₹2 Cr per company/year for R&D	—	20% of project cost or up to ₹10L for sponsored research with Govt. institutions	—	—	—
Capital Subsidy (CAPEX	10% up to ₹10 Cr for first two anchor units per	50% of Capex Assistance by	40% on GFCI +2% for women; up to	20% subsidy, max ₹10 Cr per	40% of capex support matching GoI;	40% on GFCI (+2% for women); up to	Region-based industrial capex support (focus on

Category	Karnataka	Odisha	Madhya Pradesh	Telangana	Gujarat	Uttar Pradesh	Tamil Nadu
Support)	cluster	GoI	₹150 Cr per unit	company	max 40% of eligible expenditure	₹150 Cr per unit	manufacturing, textiles, electronics)
Interest Subsidy	6% up to ₹50L for 5 years	5% per annum; max ₹25 Cr annually for 7 years	6% on term loans up to ₹10 Cr over 5 years	—	—	5% per annum; up to ₹1 Cr/year for 5 years (max ₹5 Cr/unit)	—
Land & Infrastructure Incentives	Stamp duty exemption & concessional registration for 5 years; 75% land conversion fee (startups/MSMEs), 50% (large units)	Land lease (99 years) via IDCO; 25% off for mega (>₹5000 Cr), 10% first 200 acres, 5% non-mega	100% reimbursement of stamp duty & registration for govt. industrial parks	25% subsidy on lease rentals for 10 years; 20% land use for dormitories	75% subsidy on first 200 acres (FAB); 50% on additional land	25%-50% land subsidy (region-based); up to ₹75 Cr or 7.5% of project cost	Strong port & road infrastructure; industrial parks, ELCOT/ SIPCOT estates
Electricity Duty / Power Tariff Incentives	Industrial tariff (replacing commercial); as per KERC	₹2/unit reimbursement + 100% electricity duty exemption for 10 years	—	Industrial tariff classification for electronics; renewable access up to 1⁄3rd power	₹2/unit tariff subsidy for 10 years; duty exemption under Electricity Duty Act	50% electricity duty exemption for 10 years	Concessional industrial power tariffs for manufacturing units
Global Capability Centers (GCCs)	Policy to double GCCs by 2029; rental & electricity tax reimbursements	—	—	Attractive GCC ecosystem; major IT & innovation hub	—	—	Large GCC & IT presence; existing incentives under industrial policy
Startups / Innovation Ecosystem	Largest startup hub; sector-specific incentives and funding	Strong incentives for R&D and innovation	MSME and startup support under industrial policy	Patent cost reimbursement (100% up to ₹5L)	Startup policy under Gujarat Industrial Policy 2020	Dedicated startup policy with fiscal & incubation support	Focused on manufacturing & innovation-driven startups
Ease of Doing Business (EoDB)	High; strong digital facilitation & single-window	Improving; dedicated semiconductor policy	Moderate; process-based subsidies	High; simplified registration & support	High; policy-driven facilitation	High; process reforms & digital ease	Among top-performing industrial states
Overall Focus / Strength	IT, GCCs, Semiconductor	Semiconductor R&D &	ESDM & industrial base	Electronics design, IT	FABs & semiconductor	ESDM & large-scale	Manufacturing (auto,

Category	Karnataka	Odisha	Madhya Pradesh	Telangana	Gujarat	Uttar Pradesh	Tamil Nadu
	R&D	large-scale manufacturing		hardware, GCCs	manufacturing	industry	electronics, textiles) & industrial infrastructure

Sources:

https://bcshettyco.com/comparison-of-incentives-provided-by-different-states.php

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chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.eoilapaz.gov.in/content/Incentives-for-New-Manufacturing-Set-Ups-in-India-_-Nexdigm.pdf

■ Central Government Incentives (Electronics / MSME Focus)

Production Linked Incentive (PLI) Scheme – Large-Scale Electronics Manufacturing (administered by Ministry of Electronics & Information Technology – MeitY)

- The Production Linked Incentive (PLI) Scheme offers incentives ranging from 4% to 6% on incremental sales of manufactured goods over the base year for key electronics segments such as mobile phones, IT hardware, and consumer electronics, aiming to enhance large-scale production and domestic value addition.
- In the Union Budget 2024–25, the Ministry of Electronics and Information Technology (MeitY) received a substantial increase in allocation, accounting for around 62% of the total ₹21,085 crore earmarked for PLI and semiconductor/display manufacturing

schemes.(https://www.business-standard.com/amp/budget/news/meity-receives-lion-s-share-of-pli-scheme-and-semiconductor-outlay-124072800425_1.html?)

- As of August 2025, the cumulative production under the Large-Scale Electronics Manufacturing (LSEM) PLI Scheme reached ₹9,05,820 crore, with total investments of ₹12,612 crore and the creation of approximately 128,839 direct jobs. (chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.meity.gov.in/static/uploads/2025/09/d88bd46f248015f97f10b0e1d313664e.pdf)

■ Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS)

- The Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS) provides a 25% reimbursement on capital expenditure for manufacturers of components and semiconductors—such as PCBs, sensors, and passive components—to strengthen and deepen the domestic electronics supply chain. (https://www.meity.gov.in/offerings/schemes-and-services/details/scheme-for-promotion-of-manufacturing-of-electronic-components-and-semiconductors-specs-AMxIDOtQWa)
- The scheme was approved in March 2025 with an outlay of ₹22,919 crore, targeting investments of ₹59,350 crore, production of ₹4,56,500 crore, and the creation of approximately 91,600 direct jobs. (https://telecom.economictimes.indiatimes.com/news/policy/india-approves-rs-22919-crore-pli-scheme-to-boost-electronics-components-manufacturing/119654756)
- As of July 2025, ₹720.36 crore had been disbursed to 22 approved applicants under the scheme.(chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.meity.gov.in/static/uploads/2025/09/d88bd46f248015f97f10b0e1d313664e.pdf)

■ Electronics Manufacturing Clusters (EMC 2.0) Scheme

- The Electronics Manufacturing Clusters (EMC 2.0) Scheme provides grant support for the creation or upgradation of greenfield and brownfield clusters, offering common infrastructure such as roads, utilities, and testing laboratories.
- The cluster is expected to attract ₹2,500 crore in investments and generate approximately 15,000 direct and indirect jobs.

(chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.meity.gov.in/static/uploads/2025/07/28a275a60284887f7aad28f3aa37bdd3.pdf)

■ MSME-specific supports (central)

- The government offers subsidies, interest subvention, and design/IPR support to promote MSME participation in manufacturing and innovation. These benefits are extended through various Credit-Linked Incentive (CLI) schemes, such as the Design Linked Incentive (DLI) Scheme, which supports product design and prototyping, and the Technology Upgradation Fund, which assists MSMEs in adopting modern machinery and manufacturing processes. Together, these initiatives help smaller manufacturers enhance productivity, innovation capacity, and competitiveness in the electronics value chain.

■ State-Level Incentives

Tamil Nadu (TN)

- In May 2025, Tamil Nadu launched India's first state-level Electronics Components Manufacturing Scheme, aiming to attract ₹300 billion (US$3.54 billion)crore in investments and create around 60,000 jobs.
- Under the Semiconductor & Advanced Electronics Policy 2024, the state offers up to 50% additional financial incentive over central government benefits for eligible semiconductor projects, along with land and electricity concessions and a payroll subsidy of up to ₹20,000 (US$236.6) per employee per month for three years to promote high-value employment.

(https://www.india-briefing.com/news/tamil-nadu-unveils-indias-first-state-level-electronics-scheme-37215.html)

Karnataka

- In September 2024, Karnataka proposed to double the number of Global Capability Centres (GCCs) by 2029, offering rent reimbursements, electricity-duty exemptions, and other operational incentives. (https://www.reuters.com/world/india/indias-karnataka-state-plans-incentives-double-global-centres-1000-by-2029-2024-09-27/)

- While GCCs are largely service-oriented, the state's strong ecosystem in Bengaluru and its hardware manufacturing clusters continues to support high-tech industries. For companies combining R&D, assembly, and design, Karnataka provides a robust base—particularly for electronics hardware and IoT sectors.

Haryana

- In May 2025, Haryana announced a ₹170 crore MSME Cluster Development Plan covering 11 clusters with facilities such as testing labs, training centres, and plug-and-play infrastructure. (https://timesofindia.indiatimes.com/city/gurgaon/haryana-powers-up-msme-sectors-with-rs-170-crore-cluster-development-plan/articleshow/121421261.cms)
- This initiative is especially beneficial for smaller electronics suppliers seeking to establish MSME units near the Delhi-NCR region, offering proximity to major markets and supply networks.

Uttar Pradesh

- Under the Uttar Pradesh Electronics Manufacturing Policy (amended 2022) and the state's emerging semiconductor development initiative, eligible manufacturing units are offered a capital subsidy of around 15% on fixed capital investment for projects up to ₹1,000 crore, with anchor units receiving additional incentives.
- The policy also provides 100% exemptions on stamp duty and electricity duty in designated focus regions. For semiconductor-specific projects, Uttar Pradesh extends an additional 50% capital subsidy along with 100% electricity duty exemption for 20 years, making it one of the most competitive state-level incentive packages for advanced electronics and semiconductor manufacturing. (https://uplc.up.gov.in/en/article/up-electronics-manufacturing-policy)

■ Import duties, customs regimes, and tax breaks

1. Reduced basic customs duties on finished electronics and assemblies

- The government has reduced Basic Customs Duty (BCD) on certain finished electronics.
- The Indian government has reduced the basic customs duty BCD on mobile phones, mobile printed circuit board assemblies (PCBAs) and mobile phone chargers from **20% to 15%** as of July 2024. (https://www.india-briefing.com/news/major-revisions-to-custom-duty-to-boost-local-manufacturing-33792.html/)
- Import duty on certain mobile-phone components (e.g., battery cover, main lens, SIM socket) was reduced from 15 % to 10 % in January 2024. https://www.india-briefing.com/news/india-cuts-import-duty-on-mobile-phone-components-from-15-to-10-percent-30952.html/)
- These lower duties make imported finished goods less costly relative to domestic manufacturing and help align incentives toward local production.
- For companies planning to manufacture in India, this measure improves the competitiveness of local assembly versus purely importing finished goods.

2. Full or partial customs-duty exemptions on inputs and sub-components

- In the 2025 Budget, the government announced customs duty exemptions (i.e., zero duty) on numerous parts used in mobile phone assembly, including PCBAs, camera modules, connectors, USB cables, fingerprint readers and wired headsets; these had earlier attracted a 2.5% duty. (https://www.livemint.com/technology/tech-news/budget-2025-fm-nirmala-sitharaman-exempts-custom-duty-on-lithium-ion-battery-manufacturing-of-mobile-phones-evs-11738391206757.html)
- These changes reduce cost burdens on manufacturers of sub-assemblies, making India a more favorable site for component manufacturing rather than just final assembly.

3. Exemptions and favorable regimes for capital goods and machinery

- The 2025 Union Budget exempts BCD on 35 capital-goods for EV-battery production and 28 capital-goods for mobile-phone battery production (Notification 11/2025 Customs). (https://www.ndtv.com/business-news/budget-2025-scrapping-custom-duty-on-lithium-ion-battery-to-boost-ev-manufacturing-7611188)

- The exemptions include machinery such as solvent-recovery systems, heat-recovery systems, electrolyte-injection machines, nail-inserting machines, helium-injection machines, and cell-formation / ageing machines.
- The Budget fully exempts BCD on lithium-ion battery scrap, cobalt powder/waste, lead, zinc, and 12 other critical minerals. (https://www.livemint.com/technology/tech-news/budget-2025-fm-nirmala-sitharaman-exempts-custom-duty-on-lithium-ion-battery-manufacturing-of-mobile-phones-evs-11738391206757.html)
- Parts of "open-cells" used for LED / LCD panels are now duty-free (BCD = 0), and the customs-tariff structure has been rationalised: seven tariff rates removed, leaving just eight (including zero rate) for industrial goods. (chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://fieo.org/uploads/files/file/FIEO_FEB_2025.pdf)
- These measures significantly reduce the cost of importing high-precision machinery and critical raw materials, lower upfront capital costs, and simplify the duty regime — making it more attractive for foreign electronics and battery firms to invest in manufacturing operations in India.

4. **Supplier development programs (training, certification)**

Supplier development programs are structured initiatives that upskill suppliers through formal training, audits, and certification pathways, helping them meet global benchmarks in quality, process capability, compliance, and risk management.

These programs enhance the OEM/brand's supply chain by improving on-time delivery, defect reduction, cost efficiency, and operational maturity across Tier-1/Tier-2 suppliers.

Core training and certification tracks include:

- CPSD (Supplier Development) – ISM credential covering supply-chain fundamentals, capability assessment, improvement planning, and global best practices; offered in online/onsite formats.
- CPSD (Supplier Diversity) – ISM certification focused on structuring and managing supplier-diversity programs, compliance requirements, and ecosystem development.

- CSQP (Certified Supplier Quality Professional) – ASQ certification centered on supplier quality engineering, process qualification, APQP/PPAP, auditing, and performance monitoring.
- SRM Certificate (Supplier Relationship Management) – ASCM program on supplier evaluation, segmentation, collaborative contracting, performance scorecards, and continuous-improvement frameworks.

  Additional applicable credentials include ASCM's CSCP/CLTD, and Six Sigma Green/Black Belt, which support advanced skills in supply-chain planning, logistics optimisation, and operational excellence.

  (https://www.ismworld.org/)

5. Supply-Chain Localization & Component Sourcing Challenges

Current gaps in Indian supply of semiconductors, passive components, and PCBs

- India continues to rely very heavily on imports for critical electronic components: about 80–85% of its semiconductors and PCBs are imported.
- India faces a major shortfall in passive-component manufacturing, with domestic production at $13 billion in 2022 against a projected $37 billion demand by 2030. The deficit is most acute in MLCCs, resistors, inductors, RF parts, connectors, and magnetics, where India lacks large-scale automated manufacturing and advanced materials expertise. To address this, the government is rolling out schemes like the Electronics Component Manufacturing Scheme (ECMS) to attract investment and build local capacity.
- India's passive-component ecosystem remains shallow, with domestic production at $13 billion in 2022 against a projected $37 billion demand by 2030, and value addition often only 15–20%, leaving the country heavily exposed to global supply-chain risks. The shortfall is most evident in MLCCs, resistors, inductors, and connectors, where India lacks high-automation lines and advanced materials capabilities. To reduce this dependence, the government is rolling out targeted schemes to attract investment and deepen upstream integration in component manufacturing.(https://taxguru.in/corporate-law/electronics-component-manufacturing-scheme.html)
- India's capability in advanced semiconductors (e.g., fabs, testing, packaging) is weak: local supply-chain infrastructure is not mature, and there's a shortage of design + manufacturing scale for high-complexity semiconductor chips.

(https://www.business-standard.com/industry/news/supply-chain-and-talent-woes-pose-challenges-to-indian-semicon-industry-124090400537_1.html)

- In high-end PCB segments (like multi-layer, HDI, flex), India still depends on imports; local capacity has not scaled to match demand in these more complex board types.
- Infrastructure and ecosystem bottlenecks also hinder local production: underdeveloped manufacturing clusters, high-cost finance, and limited R&D/design maturity make it hard to build globally competitive component manufacturing.

6. Strategies for Partnering with Local Suppliers

- Foreign electronics firms can deepen localization by partnering with Indian suppliers enrolled under the Electronics Component Manufacturing Scheme (ECMS), which carries a ₹22,919-crore budget and offers 4–10% turnover-linked incentives plus 25% capital-investment support to build capability in passives, PCBs, sub-assemblies, and electro-mechanical parts, encouraging joint development programs. (https://www.electronicsforyou.biz/strategy/india-electronics-components-manufacture-powering-next-leap-in-electronics/; https://taxguru.in/corporate-law/electronics-component-manufacturing-scheme.html#google_vignette)
- India remains heavily import-dependent, sourcing about 80–85% of its components (including semiconductors, PCBs, passives) from abroad, which creates long lead times and supply risk; partnering via ECMS reduces this exposure. (https://www.electronicsforyou.biz/strategy/india-electronics-components-manufacture-powering-next-leap-in-electronics/)
- Partnering also involves supplier-development programs, as ECMS mandates adherence to global standards (e.g., ISO, IATF, Six-Sigma benchmarks); international manufacturers frequently conduct joint quality-training, process audits, and certification, enabling Indian suppliers to meet global reliability and traceability requirements.

7. Supply chain localization & component sourcing challenges

- India continues to rely on imports for 80–85% of electronic components, including PCBs, passives, RF parts, connectors, and electromechanical components. This high dependence makes manufacturers vulnerable to fluctuations in global freight rates and supply-chain shocks. Industry analysis highlights that India's component ecosystem is still shallow, forcing firms to depend heavily on China, Taiwan, Vietnam, and Malaysia for critical inputs. This creates structural exposure to macro disruptions and raises landed-cost volatility. https://www.electronicsforyou.biz/strategy/india-electronics-components-manufacture-powering-next-leap-in-electronics/

- High import dependence significantly extends lead times, as components sourced from Malaysia, Vietnam, China, and South Korea typically take 4–8 weeks to reach Indian ports under normal shipping conditions. In 2024, global disruptions such as the Red Sea crisis forced vessels to reroute around the Cape of Good Hope, increasing transit times by 10–15 days and driving up shipping costs by 20–30%, according to logistics reports. These delays materially impact production planning and buffer-stock requirements for OEMs operating in India.
- Foreign manufacturers also face port-level bottlenecks in India, where congestion, documentation checks, and customs scrutiny can add 2–5 extra days to clearance times. Ports like Nhava Sheva (JNPT) and Chennai experience variable dwell times, prompting many firms to diversify inbound traffic to Visakhapatnam and Mundra ports to improve reliability. These inefficiencies increase carrying costs and complicate JIT (just-in-time) manufacturing models. (https://www.sh-sgl.com/en/news/info.aspx?itemid=2697)
- These logistics and import-dependency challenges push foreign electronics companies toward dual-sourcing and local-supplier development. Many firms are qualifying Indian suppliers for high-volume passives, mechanicals, and PCBs while retaining global suppliers for advanced or high-precision components. This approach reduces lead-time risk, lowers inventory buffers, and strengthens supply-chain resilience as India's component ecosystem expands under ECMS and PLI schemes.

8. Quality control and standards alignment with global benchmarks

- The ECMS operating guidelines, issued by MeitY, explicitly require applicants to demonstrate robust design capabilities and quality management systems, thereby promoting manufacturing practices that align with global-level process discipline.
- As part of the scheme's evaluation, companies are strongly encouraged to aim for Six Sigma-level quality, which is known for its disciplined, data-driven approach to minimizing defects and ensuring high process maturity.
- Through these quality expectations, ECMS fosters the emergence of Indian suppliers that maintain world-class testing infrastructure, defect-reduction practices, and process-control frameworks, enabling foreign electronics firms to source components with near-global reliability.
- This emphasis on design and quality capability helps integrate Indian component makers into global value chains, ensuring that locally manufactured products meet the performance and reliability criteria required by global OEMs.
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Market Access, Export Orientation & Integration with Global Supply Chains

- **Demand Forecast for PCs, Components & Sub-Systems in India**
  - *Personal Computers (PCs) & Computing Devices*

    India's PC demand continues to grow rapidly. According to IDC (2025), India shipped 4.9 million PCs in Q3 2025, the highest quarterly shipment ever recorded, reflecting strong enterprise refresh cycles and rising adoption of AI-enabled laptops. Industry analysts now project that India's total PC shipments will reach ~15 million units in CY2025, up from 11.5 million units in CY2023, driven by corporate digitisation, government procurement, and hybrid-work adoption.
    (https://my.idc.com/getdoc.jsp?containerId=prAP53938925)

    Demand for PCBs, Passive Components & Sub-Assemblies

    India's PCB market was estimated at USD 6.3 billion in 2024, and industry forecasts expect it to expand to USD 24.7 billion by 2033, driven by domestic electronics manufacturing and PLI-linked capacity growth.

    Demand is rising fastest for HDI, multilayer, and flexible PCBs, as OEMs upgrade designs for 5G equipment, EV power electronics, medical devices, and compact consumer electronics.

    The rapid scaling of India's EMS/ECMS ecosystem is increasing procurement needs for passive components, PCB sub-assemblies, camera modules, power-management sub-systems, and RF modules.

    Despite growth in local capacity, India still imports more than 85% of high-grade PCBs and advanced passives, creating sustained opportunities for foreign suppliers of laminates, copper foils, prepregs, and precision components.

    With major domestic fabs still limited in multilayer and HDI capacity, Indian manufacturers continue to rely on global suppliers from Taiwan, South Korea, Vietnam, and China for high-precision PCBs and sub-assembly components.

    Policy incentives under PLI/SPECS and increasing localisation requirements from OEMs are expected to double domestic demand for PCB-based modules

by 2030, strengthening long-term export potential for global component makers. (https://www.imarcgroup.com/indian-pcb-market)

- Export potential from Indian manufacturing plants (regional markets)
    - India's electronics manufacturing has expanded rapidly, with domestic output rising from US$ 29 billion in FY15 to US$ 101 billion in FY23, supported by US$ 17 billion in PLI incentives and a government vision to scale the sector to US$ 300 billion by FY26. Growth is led by mobile phones, IT hardware, consumer electronics, auto electronics, components, and PCBA, making India the world's second-largest mobile phone manufacturer, with 97% of domestic demand met locally and 151 million smartphone shipments in 2024.
    - India's IT–ITeS and software export ecosystem remains one of the world's strongest, contributing 7.5% of GDP and generating ~US$ 254 billion in FY24, with exports of US$ 185.5–200 billion across IT services, ITeS, BPM, SaaS, and ER&D. The sector continues to grow steadily (5–7% projected growth in FY25), driven by cloudification, automation, RPA, engineering design, and platform-led BPM services.
    - Electronics goods and software exports together position India as a major global supplier, with electronics exports reaching US$ 29.1 billion in FY24 (up 23.6% YoY) and projected to hit US$ 120 billion by 2026. The US, UAE, UK, Netherlands, and Italy are top destinations for electronics, while IT–ITeS exports are dominated by the US (56%), Europe (30.8%), and fast-growing APAC markets, reinforcing India's integration into global supply chains across hardware, software, and digital services. (https://www.ibef.org/exports/electronic-and-computer-software-industry-in-india)

      Under the PLI scheme, global manufacturers such as Foxconn, Samsung, Dixon, and Tata have ramped up India-based exports: smartphone exports exceeded USD 15–16 billion in FY2024, with major volumes directed to UAE, US, Europe, and ASEAN, supported by labor advantages and a 4–6% cost benefit from incentives.

      (https://counterpointresearch.com/en/insights/india-smartphone-exports-surge-30-yoy-in-h1-2025-to-reach-40-million-units)

- **Role of electronica / buyer-seller events in connecting supply chains**

Event	Key Data	Role in Connecting Supply Chains	Websites
electronica India & productronica India	**2,000+ structured B2B meetings, 6,000+ global brands, 50,194 visitors**	Creates India's most concentrated electronics sourcing hub; enables OEMs (Samsung, Jio, Spark Minda) to evaluate Indian suppliers, negotiate lead-time optimization, and secure cross-border supply-chain partnerships.	https://productronica-india.com/en/
India Electronics Week (IEW)	**8,000–10,000+ buyers & engineers**	Connects embedded designers with PCB, components, and IoT hardware suppliers, reducing the design-to-procurement gap and enabling faster vendor discovery.	https://www.indiaelectronicsweek.com/
India Mobile Congress (IMC)	**350+ exhibitors, 100,000+ visitors**	Functions as a telecom and device sourcing exchange linking module makers, component suppliers, and OEMs with operators—supporting localization of 5G, RF, and device hardware.	https://www.indiamobilecongress.com/
SEMICON India	**100+ global semiconductor equipment &**	Bridges global semiconductor tool/material	https://www.semiconindia.org/

Event	Key Data	Role in Connecting Supply Chains	Websites
	material suppliers	providers with India's fabs, OSATs, and component ecosystem, enabling supply-chain alignment for chip manufacturing.	
Automation Expo (Mumbai)	**800+ exhibitors, 20,000+ trade visitors**	Enables industrial buyers to source sensors, controllers, PCBs, and automation electronics domestically, strengthening Industry 4.0 supply chains.	https://www.automationindiaexpo.com/
LED Expo India	**400+ exhibitors, 12,000–15,000 buyers**	Links LED driver, power electronics, and component manufacturers with lighting/automotive OEMs, accelerating vendor qualification and diversification.	https://theledexpo.com/index.html

- **Overall Supply-Chain Impact**

Together, these events create tens of thousands of buyer–seller touchpoints every year, enabling:

- Faster supplier discovery and localization
- Benchmarking of global vs. Indian technical capabilities
- Direct negotiation on lead times, pricing, and inventory models
- Expansion of export partnerships and multi-country supply-chain links

This steady, data-backed matchmaking infrastructure is a major factor strengthening India's position as an integrated and reliable node in the global electronics manufacturing ecosystem.

Standards & Certification in Export Orientation

- India's export readiness is anchored in national conformity systems led by BIS, which maintains 22,600+ Indian Standards and operates large-scale certification schemes (CRS for electronics, FMCS for foreign manufacturers), ensuring that products meet mandatory safety, electromagnetic compatibility (EMC), and performance norms required by importing countries.
- The Compulsory Registration Scheme (CRS)—covering electronics/IT product categories—requires testing in BIS-recognised laboratories before market entry, strengthening credibility and aligning Indian output with international regulatory expectations (IEC, ISO, RoHS, EMC norms).
- The Foreign Manufacturers Certification Scheme (FMCS) adds global interoperability: with 1,143 operative licences across 56 countries, it facilitates smoother sourcing by multinational buyers who require certified, traceable components for cross-border supply chains.
- Adherence to these standards reduces technical barriers to trade (TBTs), supports mutual recognition with global buyers, and expedites customs clearance in export markets that demand documented conformity, making Indian plants more competitive as suppliers in multi-country electronics value chains.
- Compliance with BIS-backed standards also improves acceptance in markets governed by stringent frameworks such as CE (EU), UL (US), and IEC global standards, enabling Indian electronics manufacturers to match global procurement benchmarks.

Trade Agreements & Tariff Pathways (FTAs / PTAs)

Free Trade Agreements (FTAs) and Preferential Trade Agreements (PTAs) are international pacts designed to reduce barriers to trade, primarily tariffs, and enhance economic cooperation between participating countries. The core mechanism for tariff pathways involves the reduction or elimination of customs duties on qualifying goods traded between member nations, providing a competitive advantage over non-member countries.

- **India's FTAs and PTAs Relevant to Electronics**

(https://www.india-briefing.com/news/indias-free-trade-agreements-updates-2025-36271.html/#:~:text=India%20has%20established%2013%20FTAs,SAARC%20nations%20to%20reduce%20tariffs.)

India has active FTAs/PTAs with:

- ASEAN
- Japan – Comprehensive Economic Partnership Agreement (CEPA)
- South Korea – CEPA
- Australia – Economic Cooperation and Trade Agreement (ECTA)
- UAE – CEPA
- India is part of the South Asian Free Trade Area (SAFTA) which is implemented through the SAARC framework.
- MERCOSUR: India has a PTA with MERCOSUR, a South American trade bloc.

- **Tariff Pathways (FTAs / PTAs)**
- FTAs and PTAs establish preferential tariff pathways by committing partner countries to reduce or eliminate import duties on specified goods, thereby lowering trade costs.
- Under the India–MERCOSUR PTA, tariff concessions range from 10% to 100% across 450 Indian tariff lines and 452 MERCOSUR lines, making certain goods significantly cheaper to trade. (https://www.commerce.gov.in/international-trade/trade-agreements/indias-current-engagements-in-rtas/mercosur-preferential-trade-agreement-pta-negotiations/)
- In the India–UAE CEPA, the UAE eliminated tariffs on 97.4% of its tariff lines, covering 99% of Indian exports by value, while India secured duty-free access on over 80% of its own lines. (chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.commerce.gov.in/wp-content/uploads/2022/05/FAQs-on-CEPA_For-Uploading-on-DoCs-website-05-May-2022.pdf)
- Many of these tariff liberalisations are phased in over time (e.g., 5–10 years), allowing domestic industries, especially in electronics, to adjust gradually to increased competition. For example, certain lines in the CEPA are scheduled for phased elimination.
- Rules of Origin (RoO) are central to FTAs and preferential trade agreements PTAs. To claim preferential duty under these agreements, exporters must ensure their goods meet specific criteria such as Regional Value Content (RVC), changes in tariff headings, or specific processing operations.

- Exporters often need to obtain a Certificate of Origin (CoO) to demonstrate their goods meet these origin criteria and qualify for preferential treatment. These certificates are crucial documentation for international trade, verifying where goods were produced.
- Complex RoO can lower a country's FTA utilization rate because they increase compliance costs and are difficult for exporters to meet, as seen in some studies estimating India's utilization rate as low as 20–25%. Other factors like a lack of awareness among exporters and non-tariff barriers from partner countries also contribute to underutilization.
- Modern trade agreements actively address non-tariff barriers (NTBs) like technical barriers to trade (TBT), licensing, and certification hurdles because these can restrict trade as effectively as tariffs. These agreements focus on streamlining regulations and standards to promote fair and open commerce between nations.
- Many FTAs include mechanisms for mutual recognition of testing and certification (MRAs), harmonized standards, and transparent customs procedures to reduce regulatory friction.
- The UAE–India CEPA explicitly addresses technical barriers: the agreement promotes the use of international standards and reduces unnecessary regulatory burdens.