



WHITE PAPER

India in Electronics Manufacturing: PCB Manufacturing, Electronics Assembly and Component Sourcing – A Reality Check

A strategic assessment of PCB manufacturing, electronics assembly and component sourcing – as of July 2026, with an outlook and implications for Europe

EMS Strategy Group

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Initial situation

India is gaining increasing importance as a location for electronics manufacturing. Rising investments, government support programs, and geopolitical developments are leading to the country being seen more and more frequently as a future alternative or complement to China. At the same time, the actual performance of the Indian electronics sector is often assessed in a generalized way – even though the individual areas of the value chain have developed very differently.

For a realistic assessment, three areas must be considered separately: printed circuit board (PCB) manufacturing, electronic component assembly (PCBA/EMS) manufacturing, and the procurement of electronic components. Each of these areas has its own market structures, investment cycles, and stages of development.

This white paper analyzes the status quo of these three segments based on the market status as of July 2026. Furthermore, it assesses the foreseeable developments of the next two to three years and their impact on European OEMs and their procurement strategies. Finally, it evaluates the role India can play in global electronics supply chains in the future – and the resulting opportunities and challenges for Europe as an industrial location.

Part 1: PCB manufacturing – the printed circuit board itself

Status July 2026

The Indian printed circuit board (PCB) industry is currently in a capacity-building phase. New investments and government support programs are strengthening the expansion of local manufacturing, although the focus is currently still predominantly on standard and mid-range technology segments [1][2].

Technologically, manufacturing remains largely in the standard segment: 4- to 8-layer boards with medium tolerances are now the norm. AT&S India (Nanjangud), with its HDI manufacturing for IC substrates, represents one of the few technological exceptions. For complex applications such as stacked micro-vias, high layer counts (14+), and flex-rigid circuit boards, many Indian suppliers still rely on international supply chains with partners from Taiwan or China [1][7].

Outlook

The direction of investment is clearly identifiable, but technological development takes time. New production lines need to be qualified, processes for greater complexity need to be established, and skilled workers need to be trained. A gradual expansion towards 10- to 12-layer technologies appears realistic within the next two to three years. However, achieving today's Chinese HDI level across the board is not foreseeable in the medium term.

Part 2: Electronic Manufacturing Service (EMS) – Assembly and Mounting

Status July 2026

Electronics manufacturing services (EMS) represent one of the most advanced segments of the Indian electronics industry. Alongside international EMS companies, a broad base of specialized Indian suppliers has established itself, benefiting from government support programs and the increasing relocation of global electronics production [3].

Major Indian EMS providers include Dixon Technologies (broadly diversified, particularly in consumer electronics), Syrma SGS (including medical technology, automotive and RFID), Avalon Technologies (integrated manufacturing including cable assembly and box build) and Kaynes Technologies (increasingly offering ODM and development services) [3].

From pure assembly to design partner

Alongside capacity expansion, some companies are evolving from traditional contract manufacturers into integrated electronics partners with expanded expertise in development, design, engineering, and component integration. This transformation is supported by government programs aimed at increasing local value creation [4].

outlook

The EMS sector is the most advanced segment of India's electronics manufacturing industry. Production capacities have been expanded, international customer relationships established, and the scaling of existing sites continues. For standard consumer goods (smartphones, TVs, or household appliances), India has already positioned itself as an established and growing manufacturing location.

The situation is different for highly complex, low-volume or heavily regulated applications. In sectors such as medical technology, automotive safety systems, industrial electronics, aerospace, and sophisticated power electronics, Germany and other European manufacturing locations continue to be among the leading international regions due to their long-standing experience, high quality standards, and pronounced engineering expertise.

Extensive certifications, mature quality management systems, and a high level of process and development competence represent a significant competitive advantage in these areas. While India is continuously expanding its capabilities in these market segments, broad evidence of comparable expertise across a larger number of EMS providers is still lacking. Individual companies like Syrma SGS are already demonstrating that the necessary technologies and manufacturing expertise are available.

Part 3: Component Sourcing – The Real Bottleneck

Status July 2026

While capacities in PCB assembly and, to some extent, in printed circuit board production are being significantly expanded, the local availability of electronic components remains one of the biggest challenges for India's electronics industry. A considerable proportion of key components and intermediate products continue to be sourced from international supply chains, particularly from China and Taiwan [5][6][7].

The government has recognized this dependency and is promoting the development of a local component manufacturing industry. Around 75 component manufacturing projects are currently underway, and further projects have been announced for the coming years. The range extends from passive SMD components and connectors to battery cells [4][6].

Outlook

Of the three areas considered, material procurement is the area with the greatest need for improvement. At the same time, it limits the possibility of building a completely independent electronics value chain within India.

Even if a PCB assembly is fully manufactured in India, many manufacturers will remain dependent on international supply chains for components and materials for the foreseeable future. Therefore, relocating assembly to India does not automatically guarantee complete independence from Asian supply chains.

Building a more localized component industry is a multi-year development process. The Indian government is pursuing a gradual localization path and not a short-term, complete replacement of existing global supply chains.

Overall picture: Three Stages of Development

Status	Rating July 2026
PCB Assembly (EMS)	Highly advanced and economically viable, especially for consumer electronics. Expertise in more complex and certification-intensive products is growing, but is still under development.
PCB manufacturing	A solid foundation in the standard segment (4–8 layers) with increasing investments in higher technologies. However, HDI, complex multilayer and flex-rigid applications will still be exceptional areas in 2026.
Material procurement	There is a high structural dependence on international supply chains, particularly for semiconductors, laminates, and specialty materials. Significantly reducing this dependence is a long-term development process.

Assessment – What this means for procurement practice

A blanket shift of electronics manufacturing to India does not currently represent a complete 1:1 alternative to existing China structures for any of the three value creation areas.

Particularly in assembly manufacturing, India can already be a strategically relevant addition to global manufacturing networks. However, for printed circuit boards and components, dependence on established Asian supply chains remains.

Companies that relocate production to India do not automatically reduce all dependencies. Often, the structure of the supply chain simply changes: assembly takes place locally, while critical intermediate products and components continue to be sourced from existing global suppliers.

What does this mean for Europe?

This creates a strategic dual challenge for European companies: On the one hand, they are establishing further production sites in Asia – including increasingly in India – as part of risk diversification. On the other hand, the importance of a domestic European electronics infrastructure is growing in order to reduce critical dependencies in the long term.

These two developments are not mutually exclusive. Modern supply chains will increasingly rely on multiple locations, regional capabilities, and diverse hedging mechanisms.

Trend 1: Further diversification into Asia

The "China+1" strategy, which strengthens India as a manufacturing location, is also influencing European procurement decisions. Where previously China was often the sole focus, companies are increasingly considering India, Vietnam, and other Southeast Asian countries as additional production sites. This is generally not about completely replacing China, but rather about a broader distribution of production risks and greater supply security through additional manufacturing options.

Complexity Over Volume

At the same time, the Asian EMS market remains primarily focused on high-volume, cost-oriented electronics manufacturing. For complex, regulated, or high-mix, low-volume products, many European OEMs are increasingly considering manufacturing partners within Europe. The following section will explain in more detail which product groups are particularly affected.

Trend 2: Development of a European electronics infrastructure

Alongside diversification outside Europe, the development of domestic technological capabilities is gaining in importance. The aim is not complete autarky, but rather greater strategic capability through key competencies within Europe [8][9].

The approach can be described by the principle of "Sovereignty through Indispensability": Europe does not need to manufacture every technology domestically. However, it does need sufficient technological capabilities and domestic value creation in critical areas to retain the ability to make independent strategic decisions [10].

Which types of assemblies are particularly affected?

Two categories require special consideration – especially where location decisions cannot be made solely on the basis of unit costs or production volume.

Highly sensitive assemblies: regardless of batch size

For assemblies in medical technology, aerospace and safety-relevant automotive sectors (e.g. brake systems, airbag controls or ADAS components), several factors speak in favor of European manufacturing:

- **Certification and regulatory requirements:** Changes to the manufacturing site or to quality-relevant processes may necessitate extensive requalifications for products relevant to MDR, DO-160 or ISO-26262.
- **Liability and traceability:** For safety-critical products, complete documentation of materials, manufacturing processes, and responsibilities throughout the entire life cycle is required.
- **Geopolitical risk:** Critical products should not be solely dependent on political decisions, export controls, or trade restrictions imposed by individual third countries.
- **Protection of intellectual property:** Especially in defense, aviation and technologically sensitive areas, the protection of development data and manufacturing know-how is a key location factor.

For these applications, European manufacturing is therefore often advantageous regardless of batch size or production volume. The decisive factors are not primarily unit costs, but rather aspects such as safety, compliance, control, and long-term supply reliability.

Standard assemblies in low- to medium-volume production: Reassess the location issue

Outside of safety-critical applications, there is a second category where European manufacturing sites can increasingly offer advantages: small to medium batch sizes with frequent changes, high product variety, or uncertain demand planning.

Several factors affect these products:

- **Delivery times and minimum order quantities:** Long transport routes and longer lead times often do not fit with volatile demand or short-term adjustments.
- **Change management:** Adjustments to bills of materials, designs, or manufacturing processes cause additional coordination effort across large distances and multiple time zones.
- **Total Cost of Ownership (TCO):** For smaller production runs, any potential labor cost advantage becomes less significant. At the same time, factors such as logistics, customs duties, capital commitment, inventory levels, and operational flexibility become more important.

Additional regulatory drivers

In addition to economic factors, new European regulations are increasing the importance of transparent and traceable supply chains. The Digital Product Passport, as part of the Ecodesign for Sustainable Products Regulation (ESPR), will require comprehensive product and sustainability information throughout a product's life cycle [12].

The Cyber Resilience Act (CRA) introduces additional cybersecurity, vulnerability management, and documentation requirements for connected products. Manufacturers must comply with reporting obligations for actively exploited vulnerabilities from September 11, 2026; the full requirements, including CE marking, will apply from December 2027 [13].

In parallel, the NIS2 directive requires affected companies to strengthen the safeguarding of their supply chains and to assess risks at critical suppliers [14]. For assemblies with firmware or connectivity, a traceable, auditable supply chain is therefore increasingly becoming an important selection criterion.

Assessment – Conclusion

India is changing the global electronics manufacturing landscape – though not at the same pace across all sectors. The greatest progress is currently being made in PCB assembly (EMS), while material dependencies and certain key technologies remain a major challenge.

Europe is not responding to this with a withdrawal from Asian manufacturing regions, but rather with a two-pronged strategy: further diversification of supply chains outside Europe and, at the same time, building greater resilience and technological capabilities within Europe. These two developments complement each other and pursue the same goal: reducing critical dependencies and increasing security of supply.

For many standard products produced in high volumes, Asian manufacturing sites will remain economically viable in the future. However, for safety-critical assemblies and low- to medium-volume production with a high product mix, European locations are gaining increasing strategic importance. Crucial factors here are less about unit costs and more about aspects such as certification, traceability, responsiveness, regulatory requirements, and the total cost of ownership (TCO) over the entire product lifecycle.

In practice, this means that PCB manufacturing, PCB assembly, and component sourcing should be evaluated separately. Likewise, short-term procurement decisions ("Where should we manufacture today?") and long-term manufacturing location strategies ("How do we increase the resilience of our supply chain?") should not be conflated. Blanket location decisions for an entire electronics portfolio no longer reflect the realities of 2026.

Also Relevant within Europe

The same diversification logic applies within Europe. European companies are also increasingly considering multiple production sites within the region to reduce dependencies and make supply chains more robust.

Besides established industrial locations in Western Europe, countries in Central and Eastern Europe are gaining in importance. EMS locations in Poland, the Czech Republic, Hungary, Romania, and Bulgaria have well-established industrial structures, a skilled workforce, and competitive manufacturing conditions.

This is not simply about relocating to lower-cost regions, but about strategically complementing existing manufacturing networks. Factors such as customer proximity, short transport routes, regulatory certainty, direct communication, and rapid response times are becoming increasingly important, especially for more complex assemblies and low- to medium-volume production.

A robust European supply chain will therefore be defined less by a single manufacturing site in the future, but rather by a balanced network of regional EMS partners, qualified second sources and strategically selected manufacturing locations.

Further publications

A more in-depth analysis of the strategic relocation of electronics manufacturing orders and the importance of European manufacturing sites was published in the trade journal EPP – Elektronik Produktion & Prüftechnik:

"Strategically shift electronics manufacturing orders"

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About the author

Dirk Kaussen is Founder and Managing Director of EMS Strategy Group. With around 40 years of experience in the electronics industry — including founding and managing his own electronics manufacturing company in Germany — he brings deep expertise in manufacturing processes, EMS partner selection, supply chain stability, relocation projects, and risk management. His approach combines practical solutions with a direct connection to industrial reality.

About the EMS Strategy Group

EMS Strategy Group supports industrial enterprises in the strategic advancement and optimization of their electronics manufacturing operations – from high-level planning to operational execution. Our core expertise lies in the strategic relocation of manufacturing volumes to European EMS providers, the establishment of new production capacities, and the expansion of existing manufacturing structures.

Furthermore, we design resilient supply chain frameworks, conduct comprehensive risk assessments, and guide dual-sourcing strategies to secure and fortify supply chains. Upon request, we manage projects closely until a successful serial production ramp-up is achieved.

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