THE EMS INDUSTRY IN INDIA

Tour Report 2025

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EMSNOW India Tour 2025 - Overview

The "EMSNOW on Tour" dates for this initial visit to India were September 5-19, 2025.

- EMSNOW visited 13 EMS facilities across three regions in India.
- The tour began in New Delhi and ended in Bangalore, and in between we visited companies in the areas around Noida, Guragaon, Vadodara, Ahmedabad, Pune, and Mysore.
- During the tour, we recorded and published 10 podcasts about the companies we visited.
    - All podcasts are available on www.EMSNOW.com
- The tour concluded with attendance at electronica/productronica India 2025 trade show where we met with over a dozen more domestic EMS companies.

EMS Companies Visited:

Aimtron

Centum Electronics

Cyient DLM

Dixon Technologies

Incap CMS Pvt Ltd

Indic EMS Electronics

inYantra Technologies Pvt. Ltd.

Kaynes Technology India

Sahasra Electronics

Syrma SGS

Uno Minda Ltd

Varroc

Vinrox Technologies

A profile of each of these EMS company can be found on EMSNOW under the EMS Profiles tab.

We also recommend that you listen to the related podcasts for these companies that provide further insights from our visits not included in the profiles. The podcasts can be found on the EMSNOW website.

TOUR SPONSORS

EMSNOW wishes to thank this year's tour sponsors. The support of these leading brands in the electronics manufacturing industry allowed us to conduct this tour and provide our reporting and observations on the Indian EMS industry.

CalcuQuote - Source, Quote, Purchase Smarter — All in One Platform.

Koh Young – True 3D Smart Factory Solutions, Powered by AI.

TrustedParts.com – Genuine electronic components from only authorized sources

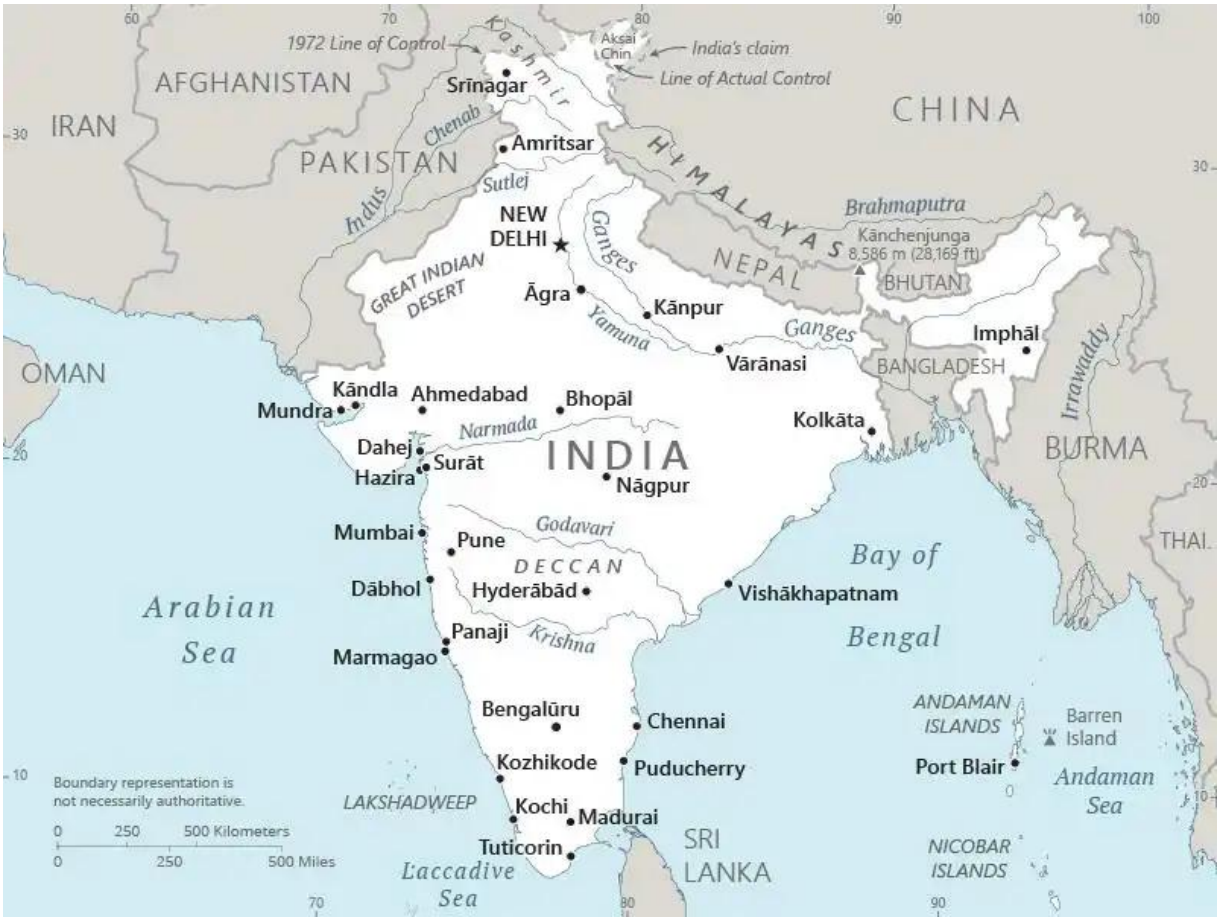
We encourage all readers to give these companies your consideration when you have a need for the type of product and service they provide.

In addition to our sponsors, EMSNOW is grateful to the Global Electronics Association staff that were so helpful and knowledgeable in helping to plan and execute this tour.

Specifically:

- Gaurab Majumdar, Vice President, Southeast Asia, India & MEA
- Sneha Srikantan, General Manager – India & Southeast Asia
- Abhishek Upadhyay, Regional Manager – North India, UAE & Bangladesh
- Neha Malviya, Regional Manager – West India
- Vittal Vata, Regional Manager – South India, Saudi Arabia & Sri Lanka

INDIA - COUNTRY PROFILE



Geography: 3,287,263 sq km

Capital: New Delhi

Government: Federal parliamentary republic

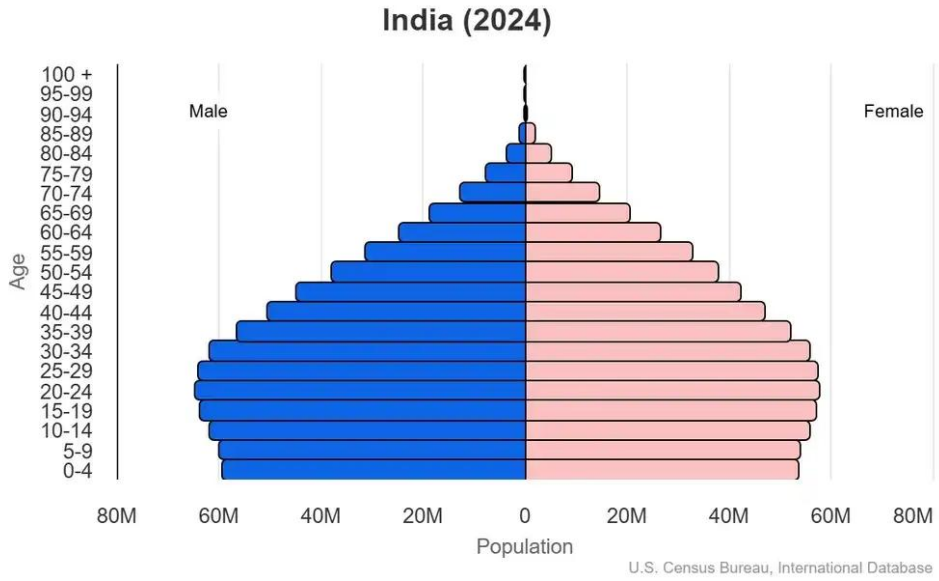
- Independent since 1947.
- India is comprised of 28 states and 8 Union territories.

Real GDP: $13.173 trillion (2023 est.)

Export partners: USA 19%, UAE 7%, China 4%, Germany 3%, UK 3% (2023)

Import partners: China 19%, Russia 10%, USA 6%, UAE 6%, Saudi Arabia 5% (2023)

Population: 1,409,128,296 (2024 est.)



Languages: Hindi 43.6%, Bengali 8%, Marathi 6.9%, Telugu 6.7%, Tamil 5.7%, Gujarati 4.6%, Urdu 4.2%, Kannada 3.6%, Odia 3.1%, Malayalam 2.9%, Punjabi 2.7%, Assamese 1.3%, Maithili 1.1%, other 5.6%; English is the subsidiary official language but is the most important one for national, political, and commercial communication (2011 est.)

All data sourced from the CIA World Factbook (www.cia.gov/the-world-factbook).

THE EMS INDUSTRY IN INDIA

I. INDUSTRY OVERVIEW AND COMPOSITION

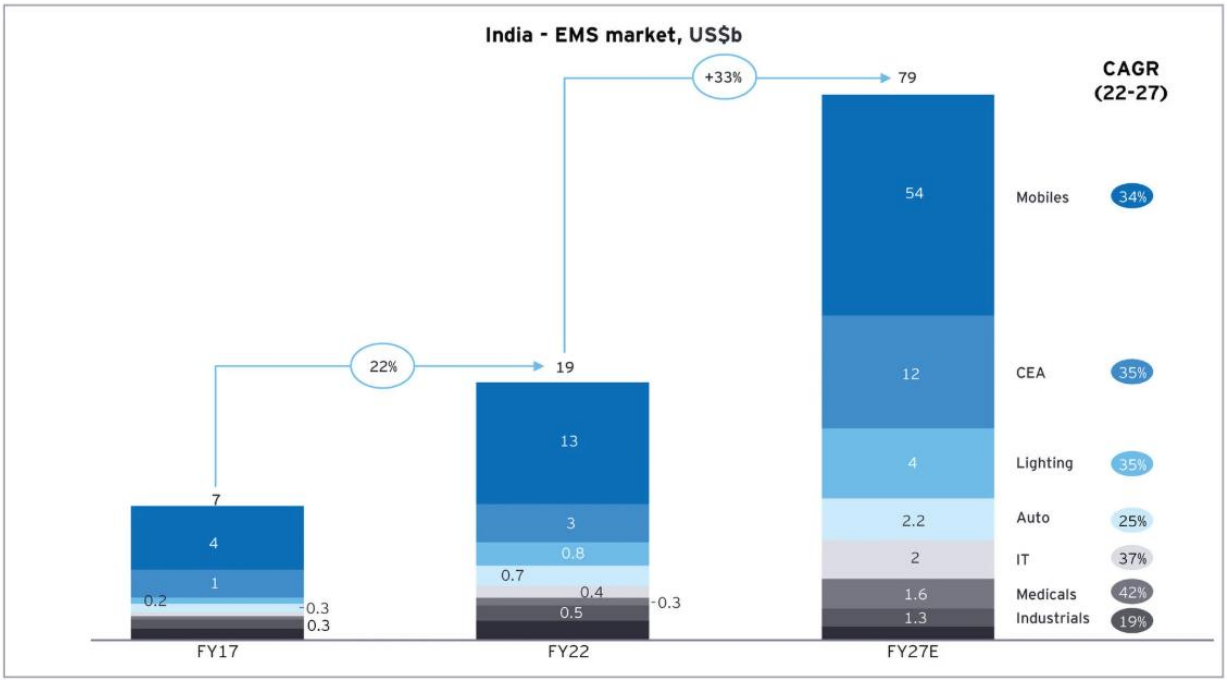
- India has emerged as one of the most exciting, vibrant, and fast-developing regions for EMS globally.
- The industry benefits from low-cost labor, skilled engineering talent, and strong government support.
- The evolution of India's EMS sector mirrors China's development in its early years.
- Prime Minister Narendra Modi is widely credited as a driving force behind India's manufacturing evolution.
- The future is bright for the sector as more major electronics players enter the Indian market.

EMS INDUSTRY SIZE

The current size of the EMS industry in India is a bit of a mystery. We have seen various forecasts, and some of these conflate overall electronics manufacturing production with electronics manufacturing services revenues.

New Venture Research (NVR) sized the market in India at $24.9 billion with a total available market in 2023 of $163 billion. That was forecast to grow to $37.2 billion by 2029 with TAM at $439.9 billion; that's a CAGR of 7.20%.

Ernst and Young was more optimistic in 2023: "Over the next five years, the EMS market in India is expected to reach US$80 billion, providing growth opportunities to strategic and financial investors. A large chunk of this growth will be seen in mobiles and consumer electronics and appliances, followed by lighting, auto, and others."



BlueWeave Consulting, a leading strategic consulting and market research firm, in its recent study, estimated India's Electronics Manufacturing Services (EMS) market size by value at USD 61.85 billion in 2024. During the forecast period between 2025 and 2031, BlueWeave expects India's EMS Market size to boom at a significant CAGR of 28%, reaching a value of USD 348.17 billion by 2031.

The size of the EMS industry in India was represented to us by the people we met with in a range from a low of US$80B to a high of US$150B. The most frequently cited sizing was ~US$100B.

All sources forecast robust growth for the EMS industry through the end of this decade to as high as US$300-400B. This is consistent with the growth forecasts for the individual EMS companies we met, which ranged from 15-45% CAGR.

This is definitely an issue that would benefit from a thoughtful market research effort using consistent industry definitions to determine who and what should be included in the assessment. Hopefully someone will take up this challenge and provide greater clarity on the issue.

GROWTH DRIVERS FOR EMS INDUSTRY IN INDIA

- China + 1: diversification of OEM supply bases
- More OEM outsourcing as electronics become ubiquitous in all societies
- Government policies that favor Make In India
- Growing middle class with more disposable income fueling domestic consumption

As EMSNOW has been reporting, the EMS industry in India is developing rapidly. It has been consistently estimated to us that there are 400+ EMS companies currently operating in India, both foreign owned and domestic, ranging in size from small EMS to large players like Foxconn, Jabil and Flex.

Roughly 60-65% of EMS market in India currently supports consumer and mobile telecom industry and most of the products manufactured by EMS in India are exported. With the increased growth of the middle class in India, more electronic products are expected to be produced for domestic consumption. The Indian government is also a major purchaser in certain product sectors, and they are proudly supporting the Make In India initiative.

KEY EMS MANUFACTURING HUBS IN INDIA

India's Electronics Manufacturing Services (EMS) industry has developed several specialized manufacturing clusters across the country. The primary hubs, divided into regions, are:

Northern Region:

- Noida-Greater Noida (UP): A major center for electronics manufacturing near Delhi, hosting companies like Dixon Technologies and Samsung's largest mobile factory in the world.
- Gurugram-Manesar (Haryana): Known for automotive electronics and consumer electronics manufacturing.

Southern Region:

- Bangalore (Karnataka): India's Silicon Valley, home to both electronics design and manufacturing facilities, with a focus on high-tech products and R&D.
- Chennai-Sriperumbudur (Tamil Nadu): A significant hub for mobile phone manufacturing and electronics, known as India's "Electronics Hardware Manufacturing Capital."
- Hyderabad (Telangana): Growing center for electronics manufacturing, particularly in aerospace and defense electronics.

Western Region:

- Pune-Mumbai (Maharashtra): Strong in industrial electronics and automotive electronics manufacturing.

- Gujarat Electronics Manufacturing Cluster: A newly developed center under government initiatives, focusing on contract manufacturing.

Eastern Region:

- Bhubaneswar (Odisha): An emerging hub with government support for electronics manufacturing.

These clusters are strategically located near airports, ports, and transportation networks to facilitate both domestic distribution and exports. Each hub typically specializes in particular segments of the electronics value chain, with increasing vertical integration within these manufacturing ecosystems.

EMS Services & Manufacturing Mix

The electronics manufacturing industry in India is attempting to build out the entire electronics ecosystem, and the EMS we visited are determined to offer a comprehensive range of service offerings. The electronics manufacturing industry is in the early stages of developing capabilities in wafer production, VLSI, advanced packaging and so forth through government initiatives and a breathtaking number of international alliances with Korea, Japan, Denmark, and the U.S. However, semiconductor manufacturing is still in its infancy in India. Establishing the complete component manufacturing and supply chain ecosystem within India will take many years and sustained effort and investment.

Presently, EMS companies promote themselves as 'one-stop shops' for Electronic Systems Design and Manufacturing (ESDM). They are adding capacity and capabilities rapidly. Several of the EMS we met either had or were planning to vertically integrate PCB manufacturing into their service portfolios as well.

We saw a full range of manufacturing environments that did everything from High Volume-Low Mix (HV/LM) to High Mix-Low Volume (HM/LV) production. The most common mix at the companies we visited was High Mix-Low to Medium Volume production. This reflects the industry sectors and types of products made. We are aware that many large facilities have been established in India by EMS such as Flex, Foxconn, and Pegatron to produce cell phones and other consumer products which are higher volume lower mix type products.

Getting a facility up and running in India can be challenging because EMS requires a substantial footprint and land is expensive in the urban areas. The campus base approach seems to be an effective method for addressing the issue and Special Economic Zones are established in the states hosting the manufacturing campuses, but it is likely these will have to be expanded to accommodate the aggressive growth objectives.

Automation Levels Impacted by Manufacturing Mix

The EMS we visited had highly automated production floors as did nearly all the EMS we have visited globally on previous tours. The focus is now on automating more post reflow processes and warehouses with an aim to achieve low touch manufacturing operations.

The manufacturing of high-volume low-mix products like cell phones and other consumer products certainly benefit from highly automated assembly lines. However, for the high-mix, low- to medium-volume manufacturing operations, as represented by most all the EMS companies we met, automating post-reflow functions is price prohibitive. This means that a sizeable workforce to conduct this work is required.

We were told by several sources that there are an estimated 2,500+ SMT lines currently operating in India by both EMS and OEMs. This is sure to increase in the years ahead with the anticipated growth of the industry.

The EMS companies we visited accounted for over 240 SMT lines. Not all EMS had standardized SMT equipment sets across their operations although those that did not indicated that in the future they would work towards that end.

The most common types of SMT equipment we saw were: (listed in order of frequency)

- **Screen Printers**: ASM/DEK, Fuji, Juki, Panasonic, Yamaha, EKRA, ETA, GKG
- **SPI**: Koh Young, Juki, Cyberoptics, Mirtec, CKD, TRI, VI Tech
- **Mounters**: Fuji, ASMPT, Panasonic, Yamaha, Juki, Mycronic
- **Reflow Oven**: Heller, Vitronics, JT, ERSA, Lyra, BTV
- **AOI**: Koh Young, Omron, TRI, Mirtec, Juki, Cyberoptics, Yamaha

One interesting and unique piece of equipment that we saw installed in many SMT lines was called a “sticky roller.” This equipment is used before the screen printer to clean the bare PCB boards of any residual dust or particles prior to having solder placed on the boards.

EMS CUSTOMERS & SECTORS SERVED

Indian EMS companies recognize that they need earlier engagement with customers in Europe and the Americas to capture business and some of the EMS visited on this tour were in the process of building those relationships and expanding overseas. Big OEM players are already in India: Apple, Samsung, Xiaomi, LG, Bosch, Siemens, Applied Materials, and ABB, for example have facilities and employees in India.

India's Top 10 Electronics Manufacturing Companies				
Company	India presence	Manufacturing locations	Products	Investments
Samsung	1996	Noida (Uttar Pradesh) Sriperumbudur and Chennai (Tamil Nadu)	Smartphones, Smart TVs, refrigerators, washing machines, air conditioners	Over US$1 billion in India manufacturing till date
LG Electronics	1997	Greater Noida (UP), Ranjangaon (Maharashtra), Chennai (Tamil Nadu)	Smartphones, consumer electronics, home appliances	Over US$250 million in India manufacturing
Xiaomi Technology India	2014	Sri City (Andhra Pradesh)	Smartphones, smart TVs, smartphones accessories	US$200 million initial factory investment
Foxconn Technology Group	2006	Sri City (Andhra Pradesh), Chennai (Tamil Nadu), Karnataka	iPhones, electronics components	Over US$1 billion committed investment in India
Flextronics Technologies (India)	2000	Chennai (Tamil Nadu), Sriperumbudur (Tamil Nadu)	High-end electronics, servers, medical devices	Over US$500 million in India
Elin Electronics	1979	Noida (UP), Dehradun (Uttarakhand), Roorkee (Uttarakhand)	Invertors, UPS systems, stabilizers, solar products	Over INR 2.5 billion (US$29 million) in manufacturing facilities
Dixon Technologies	1993	Noida (UP), Dehradun (Uttarakhand)	LED TVs, home appliances, security cameras, mobile phones	Over INR 6 billion (US$70.8 million) in manufacturing facilities
Orient Electronics	1977	Faridabad (Haryana)	Lighting products (CFL, LED lighting), fans, switches, switchgear	Over INR 3 billion (US$35.4 million) in manufacturing facilities
Amber Enterprises India	1990	Rajpura (Punjab), Greater Noida (UP)	Air conditioners, refrigerators, washing machines, microwave ovens.	INR 2 billion (US$23.6 million) manufacturing facility in Rajpura
Syrma Technology	1996	Chennai (Tamil Nadu), Himachal Pradesh	Servers, networking equipment, healthcare devices	Planning new facility investment of INR 2.4 billion (US$28.3 million)

SOURCE: India Briefing

Some of the more prominent industry sectors being served are:

Automotive Electronics

EMS companies in India are building the electronics for electric vehicles, including battery management, antilock brake systems, infotainment displays, lighting, and sensors. The New Delhi region, including Noida are strong in consumer and automotive; the Pune and Chennai regions are 90% and 80% automotive, respectively.

Consumer Electronics

Roughly 60-65% of the EMS market in India currently supports the consumer and mobile telecom industries. As shown in the chart above, Samsung, LG Electronics, Dixon Technologies, Amber Enterprises and Syrma Technology have been building these products in India since the 1990s. These companies pioneered electronics manufacturing in India.

Defense Electronics

As is true in many countries and regions, global geopolitical instability is driving a conversation in India about building defense capabilities independent of any global alliances. National security increasingly requires self-reliance, and that means that the EMS industry in India is gaining the certifications and expertise to build military systems. Government initiatives in defense procurement and dedicated defense and aerospace hubs in the Bangalore region are supporting both domestic customers and global customers wanting that type of advanced manufacturing.

Industrial Electronics

Another market sector that is gaining traction is the broad category of 'industrial electronics' including solar, IoT, power supplies, lighting and so forth. The Gujarat region is strong in these areas.

Medical electronics

Medical electronics is another sector targeted for growth. Most of the products currently manufactured are of the non-invasive nature or health related devices. More advanced medical electronic products should develop in parallel with the development of the required capabilities and certifications.

MANUFACTURING SOFTWARE & DIGITALIZATION

The manufacturing software platforms used by EMS companies globally are key to ensuring the efficiency, control, and scalability of their operations. This includes ERP, MES, and quoting platforms.

The EMS we visited all used a modern ERP software platform to manage their operations. The most frequently cited system was SAP.

There was a greater variety of MES systems. The most frequently cited were SAP, BAAN, Siemens, Aimlet, and Sigma. Interestingly, several EMS reported having their own internally developed MES systems. This is consistent with internal initiatives noted on our previous tours in other global regions.

The majority of the EMS we met reported still utilizing their own internal quoting processes. A few EMS reported using industry platforms such as CalcuQuote, Factwise, and Aimlet.

Digitalization

India is a highly digitalized country and the EMS companies we met all reflected this. The challenge is now to optimize the digital processes they have established to maximize the benefits for their operations. Several EMS companies reported that getting their workers to understand and properly use the digital tools was their biggest challenge in this area.

II. INFRASTRUCTURE & CUSTOMS

INFRASTRUCTURE

In the past, a major concern expressed about manufacturing in India was the state of the country's infrastructure. Questions arose about whether the existing infrastructure could support the industry. Over the last decade, India has embarked on an ambitious journey of infrastructure development to revitalize and strengthen the economy. While improvement could still be made in some areas, we were generally impressed by what we saw.

Energy and Power

- Oil remains the primary source of electricity; clean energy is growing but still limited, and nuclear power plays a minimal role.
- The electricity grid can be unstable, with periodic power outages, requiring facilities to have backup generators.
- As the industry grows and the need for more power increases, this is probably the main challenge that the industry must work with the government to address.

Transportation and Logistics

- Road infrastructure is generally good, but traffic congestion—especially within city limits—is a major issue.
- National highways allow for efficient travel once accessed, though city-to-highway connections can be chaotic.
- Road conditions often deteriorate during the rainy season.
- India boasts the fourth largest rail system in the world with over 84,000 miles of track.
    - The majority of the rail system is electrified.
    - We were told that fiber optic cables have been laid along all of the rail tracks nationally.
- Major cities benefit from metro systems that are extensive and effective, providing a modern public transit alternative.
- Logistics remains a key challenge; improvements are ongoing, with new freeways being developed.

According to the World Bank's Public-Private Infrastructure Advisory Facility India is the 'most improved' infrastructure investment climate since 2017. "The quality of India's infrastructure procurement processes has also improved significantly helping to bring better value for money and higher quality outcomes from investment. Regulatory and permit reforms have led to a marked improvement in the ease of starting a business, encouraging investment and competition from new suppliers. However, the impact of the COVID-19 pandemic and the lack of private investment in infrastructure projects present as key challenges for India's ability to close the infrastructure gap and deliver future projects."

Infrastructure market overview - India

Metric	India	Lower-middle-income countries
GDP per capita (USD)	2,280	2,582
Population (million persons)	1,393	3,363
Infrastructure quality	68	57
Infrastructure investment (% of GDP)	4.5	5.4
Infrastructure gap (% of GDP)	0.5	1.7

Source: The World Bank

According to the World Bank, 78% of the investment in infrastructure in India was for transportation. According to investment research firm CFA Institute, India is focused on roads. An average of 33.8 kilometers (21 miles) of highway per day are being constructed, forming one of the world's largest road networks.

Overall, government capital expenditure on infrastructure improvement has surged more than fivefold over the past decade, with a record INR11.21 trillion (USD127 billion), or 3.1% of GDP, earmarked for financial year (FY) 2025-2026. Yet despite this momentum, India still faces an infrastructure financing gap, they say.

EMSNOW's experience moving around in the country was in general positive. Drivers in India are very assertive, and advancing in traffic, regardless of the vehicle type, requires adherence to the fundamental rule of whoever gets there first wins (i.e., he who hesitates loses).

Customs and Related Processes

- Import and export procedures are often cumbersome and slow, delaying material shipments.
- The entire system is digitalized, so the slow process is attributed primarily to bureaucratic procedure and traditional practices.
- Customs officials may flag smaller packages with high declared values (e.g., electronic components), causing delays for further inspection.
- Quicker customs clearance and streamlined logistics are essential for global competitiveness.

III. Supply Chain & Industry Development

Supply Chain Formation

A fully established local supply chain is critical for India's EMS growth. According to the meetings we had, India does benefit from strong local metal, plastic and packaging providers. The main complaints we heard were about the component supply chain.

Component Distribution:

- Most of the major component distributors have sales offices in India, and there are also a growing number of local domestic distributors.
- Currently, no major distributor warehouses exist in India, causing two-weeks added time after lead time for receiving parts from hubs like Singapore or Hong Kong.
- Avnet is reportedly building a bonded warehouse in India, but EMSNOW was not able to get information about when it would be online.
- Some component manufacturers do authorize some product lines for domestic distributors in India, but that doesn't solve the problem when one missing part can shut down a production line.
- This challenge was repeated at nearly every EMS company visited.

When asked about this, our component industry sources acknowledged that working with India to get components in and out of the country was very challenging, and they were very much aware of the growing importance of electronics manufacturing in India as customers moved manufacturing out of China; they noted that the government is working on streamlining customs procedures, and they are watching the situation.

Bare PCBs and Laminates:

The government's Electronics Component Manufacturing Scheme promotes local PCB and component production.

- Bare PCBs and laminates are 90% imported currently; this is an area where there is intense interest in developing domestic independence.
- We saw several examples of EMS companies we visited addressing this issue:
    - *Sahasra* Electronics operates a PCB fab for both internal and external customers.
    - *Syrma SGS* plans to build a new PCB facility serving internal and external customers.
- We were told by one company that when they purchase PCBs from China the cost is X, but if they try to order the required materials to build domestically the price is greater.

Industry Structure and Expansion Strategies

The campus-based approach and Special Economic Zones (SEZs) have proven effective for concentrated development. We expect to see an increase in the number of these around India.

Some Indian EMS companies are establishing front-end operations in North America and Europe to serve customers during product development phases, later transferring production back to India.

As the EMS industry continues to mature, fast-track customs processes and local component distribution will be necessary to enable quick turn manufacturing.

IV. Workforce and Labor Environment

LABOR FORCE AND COSTS

- Wages and rates vary across states and by skill level (i.e., skilled vs. unskilled).
- Overtime pay is usually at the standard pay rate.
- Workers are typically paid monthly.
- There is ample skilled manpower, though final or specialized training (i.e., upskilling) is often required.
- Companies are eager to upskill their workforce and seek training and certification from global associations.
- In India, there is no unemployment compensation benefit, so if you do not work you do not make money!

The minimum wage averages around ₹17,000 per month, plus approximately ₹2,000 in employer costs (healthcare, social security).

According to India Briefing, "India uses a complex method of setting minimum wages that defines nearly 2,000 different types of jobs for unskilled workers and over 400 categories of employment, with a minimum daily wage for each type of job. The monthly minimum wage calculation includes the variable dearness allowance (VDA) component, which accounts for inflationary trends, that is, the increase or decrease in the Consumer Price Index (CPI), and where applicable, the house rent allowance (HRA). "

As mentioned, there is ample engineering talent in India, including the diaspora of people that went abroad for jobs, but now see opportunities at home. However, it takes a broad range of skills to do electronics manufacturing and more extensive training programs will be essential to meet the industry growth targets.

There is a higher attrition rate within the cities where competition for workers is more acute. This requires companies to constantly recruit and train workers and focus on becoming "employers of choice" to better retain workers. This was often cited as one of the main challenges that EMS companies must manage.

GENDER POLICIES AFFECTING WORKPLACE

- Historically, women were not allowed to work night shifts due to safety concerns.
- It is now permitted, but factories must provide transportation for female employees to and from night shifts.
- This change increases labor participation while ensuring worker safety.

V. Business Climate & Competitiveness

INDUSTRY COMPETITION AND BUSINESS CULTURE

- There is strong competition for new business reported by the EMS companies visited.
- Many EMS proudly reported their long-term relationships with many of their customer engagements.
- Vietnam, Cambodia, and Indonesia were the most often cited competitive alternatives for EMS investment. However, India's government incentives, engineering base, and cost structure are increasingly attractive.
- India's ban on Chinese nationals entering the country (following a border incident 5 years ago) was lifted in July 2025, potentially reopening collaboration channels.
- India will have to be mindful in the years ahead as they balance their competitiveness with China with its still existing dependence on China for certain raw materials and components.
- Indian business culture is marked by exceptional courtesy and hospitality—companies honor guests and conduct meetings with respect.

GOVERNMENT SUPPORT AND POLICY INITIATIVES

The Indian government actively supports electronics manufacturing through a variety of programs launched in 2014 under the banner 'Make In India'. These include:

- Production-Linked Incentive (PLI) scheme
- Electronic Component Manufacturing (ECM) scheme
- Special Economic Zones (SEZs)

Overall, these investment and incentive schemes have been well received and have yielded substantial improvements, although there have been some hurdles to overcome.

Tariffs were not reported to be an issue for the Indian EMS we met. India levies no duties on material in and out of the country if it is for export. The customs processes are a time issue that needs to be included in all production planning and scheduling.

Electronics for export are excluded from the recent steep tariffs imposed by the Trump administration on India.

Executives interviewed by EMSNOW did express the more general desire to see certainty around tariffs because when business is unpredictable it tends to slow down, and they are eager to add more customers.

VI. EMSNOW Insights on Electronics Manufacturing in India

These are some of the main issues and trends we noted from our discussions with and observations at the EMS companies we visited.

BENEFITS OF MANUFACTURING IN INDIA

The primary benefits of building electronics in India are:

- Low-cost labor
- Engineering talent from local universities
- Government support
- Large potential domestic market

The consensus from those we visited is that the Make In India initiatives have been highly successful. They include:

- US$10 Billion in incentives under the Production Linked Incentives (PLI) initiative, semiconductor and digital infrastructure programs. The automotive, medical device, aviation, and telecoms sectors have been especially targeted with investment under these PLI programs.
- Special Economic Zones (SEZ) incentives resulting in price competitiveness through duty waivers and export refunds

As mentioned, most of the EMS production output is currently for export, but domestic demand is increasing, including from the government of India itself. The Indian government was referenced as one of the largest customers in certain product sectors.

EMS service offerings have expanded dramatically under the government incentive structure with companies moving up the value chain to offer design, testing and complete product lifecycle management. This has significantly improved the sector's prospects in capturing programs moving out of China.

India's vast pool of engineering talent has long been cited as a major advantage for high tech manufacturing in this geography. India has historically been dominant in software engineering, sending its graduates all over the world for decades. However, it wasn't until the government's Make In India and Production Linked Incentive (PLI) schemes created substantial financial incentives and major foreign direct investment to reduce the country's reliance on imports that hardware manufacturing has truly become competitive.

Another following wind for electronics manufacturing in India is the geopolitical climate of global companies seeking a 'China Plus One' strategy to mitigate risk.

After decades of starts and stops, it seems as though finally the stars have aligned to make electronics manufacturing in India more feasible. As the government makes it easier for global companies to do business in India, the growth story is expected to continue**.**

CHALLENGES OF MANUFACTURING IN INDIA

The main challenges to growth cited by the executives EMSNOW interviewed during the tour were related to ease of doing business. Getting things in and out of the country can be a cumbersome process and for electronics manufacturers that means time lost waiting for components to clear customs. The concern is that customs officials see small packages of, for example, semiconductors with large dollar values attached and they think something must be wrong. So, they choose to inspect boxes, delaying shipments for weeks.

Earlier this year, the Modi government introduced the Electronics Component Manufacturing Scheme to address this problem by incentivizing both foreign and domestic investment to build out the domestic electronics ecosystem. This would bypass the need to streamline customs, although efforts are being made to put in place some type of fast-track customs process.

Establishing the entire electronics eco-system in India is a goal that will take time to achieve. During that time, India will have to carefully manage its relationship with China while pursuing its objective to be free from its current dependence on China for certain components and materials.

Skilled labor issues will also be a challenge. While there is considerable engineering talent in India, the skillset needed for manufacturing must be put in place through training programs and investment. This is an area where India can learn from the mistakes made in China. In 2014, BBC sent reporters to Foxconn factories in China to reveal shocking conditions for workers building the world's iPhones that hurt the Apple brand, for example. Ensuring that worker protections are in place will prevent such brand damage for manufacturers in India.

SUSTAINABILITY

India has positioned itself as a global leader in clean energy with ambitious goals to achieve Net Zero by 2070. "At the heart of this journey lies green hydrogen, a fuel that promises to decarbonize our hardest-to-abate sectors, open new trade frontiers, and create a cleaner and more secure future," explained Government Minister Shri Shripad Yesso Naik. He noted recently that through the National Green Hydrogen Mission, they aim for India to emerge not just as a consumer, but as a global hub of innovation, manufacturing and deployment in hydrogen technologies.

The Ministry of New and Renewable Energy **(**MNRE) has already supported more than 200 R&D projects in renewable energy, fuel cells, hydrogen, and storage technologies. Dedicated funding, testing facilities, and incubation programs have been created so that Indian researchers and innovators have the ecosystem to "translate ideas into breakthrough solutions."

COMPARISON WITH CHINA 20+ YEARS AGO

EMSNOW was struck by how similar the situation is in India now compared to China 20+ years ago. Then, the main draws for companies to establish their manufacturing in China were low-cost labor, the large number of college-educated engineers being produced annually, government support for the manufacturing sector, the appeal of a large potential domestic market, and the overall consensus in financial markets that manufacturing was a cost center that could easily be offloaded.

Global electronics manufacturing site decisions are far more complicated now, but there are some parallel drivers. India has a large low-cost labor force; a good university system producing many engineers; strong government support at both the national and state level; geopolitical conditions that favor India; the lure of a huge domestic market; and the growing importance of the Asia Pacific region to global business.

It is said that "you always build your second house better," and India should benefit from what happened in China over the decades to make that country the next factory of the world. Lessons were learned about government incentives, labor policies, intellectual property (IP) protection, automation, and the importance of these for attracting customers that will likely accelerate Make In India.

The business community in India is wary of the intense competition they face from China. At one point India had stopped allowing visas for Chinese nationals for a 5-year period after border tensions increased. That was rescinded at the end of July of this year. Geopolitical tensions have eased somewhat recently with Modi attending meetings with his counterparts in China.

"Return of the Expats"

Another interesting dynamic is the current return of Indian expats. Expats are people who live in a country other than their native country. There has been a trend over many decades whereby the students from a particular country go to either the United States or Europe to attend college and then upon graduation go to work for a company in that country where they develop their industry knowledge and expertise and also cultivate a network of business associates. After a period of time, these former students, now industry veterans, return to their country of origin and help develop the local industry. Many become entrepreneurs and start their own companies.

This has happened previously with students from Taiwan, South Korea, China, and Vietnam, to name some of the more prominent Asian examples. This dynamic is now also occurring in India.

VII. FINAL THOUGHTS: THE FUTURE FOR THE EMS INDUSTRY IN INDIA

- India's EMS industry is on a strong growth trajectory, supported by:
    - A favorable policy environment
    - Expanding infrastructure
    - A maturing supply chain
    - Increasing foreign interest
- The next decade will likely see India evolve from an "emerging" EMS hub to a core pillar of the global electronics manufacturing ecosystem.
- India has a strong pool of knowledgeable and experienced professionals in the EMS industry who are poised to be a driving force in its continued growth.
- The industry should also attract industry professionals from other global regions as has happened elsewhere in this industry over the past decades.
- Increased M&A activity will undoubtedly also occur as more EMS seek to establish a presence in this important country, and smaller companies consolidate into larger ones.
- As electronics industry analysts researching India over the past few decades, EMSNOW is pleased to observe this geography, with its fascinating history and rich culture, achieve its goals for high tech hardware manufacturing.
- We look forward to seeing what comes next for India, and we will continue to report on this continuing story.
- With its learning mindset, government partnership, and cultural strengths, India is poised to become the "second factory of the world."

Thank You!

APPENDIX 1

PROFILES OF EMS COMPANIES VISITED

These are the EMS companies that we met with and toured their facilities.

COMPANY	URL	PROFILE LINK ON EMSNOW
Aimtron	www.aimtron.com	Aimtron
Centum Electronics	www.centumelectronics.com	Centum Electronics LTD
Cyient DLM	www.cyientdlm.com	Cyient DLM
Dixon Technologies	www.dixoninfo.com	n/a
Incap CMS Pvt Ltd	www.incapcorp.com	Incap CMS
Indic EMS Electronics	www.indicelectronics.com	Indic EMS Electronics
inYantra Technologies Pvt. Ltd.	www.inyantra.com	InYantra
Kaynes Technology India	www.kaynestechnology.co.in	Kaynes
Sahasra Electronics	www.sahasraelectronics.com	Sahasra Electronics
Syrma SGS	www.syrmasgs.com	Syrma SGS
Uno Minda Katolec	www.unominda.com	Uno Minda Katolex
Varroc	www.varroc.com	Varroc
Vinrox Technologies	www.vinrox.com	Vinrox Technologies

These are some additional EMS companies we met with at the Productronica India 2025 tradeshow. We have not toured their facilities nor had opportunity to speak with them in depth about their business.

Company	URL
AAVIZA Electronics	www.aaviza.com
Alica Technologies	www.alicatechnologies.com
Allnyx	www.allnyx.com
Avalon	www.avalontec.com
CEM Electromech	www.cemelectromech.in
Elcoteq Assemblies	www.elcoteqassemblies.com
Elventive	www.elventive.com
Hi-Rel Tech	www.hi-reltech.in
Krypton India Solutions	www.krypton-solutions.com
LeePra Technologies	www.leepra.net
Mefron	www.mefron.com
Pulraj Electronics	www.pulraj.com
SFO Technologies	https://sfotechnologies.net/
Vikin Electronics	www.vikinelectronics.com

APPENDIX 2

ON TOUR METRICS

Date	# Days	# Countries	Countries	# EMS	# KMs*	# Hotels	# Industry Events	Events
2021	19	4	Austria, Estonia, Germany, Switzerland,	13	3136	7	1	IPC EMS - Tallinn
2022	20	5	Belgium, France, Germany, Sweden, The Netherlands	15	4500	11	1	Electronica 2022
2023	19	6	Austria, Germany, Hungary, Slovenia, Switzerland, UK	19	3200	14	2	IPC EMS – London; EMS Forum
2024	14	3	France, Germany, Tunisia	14	3425	8	1	EMS Forum
2024	8	4	Estonia, Germany, Lithuania, Romania	11	2018	5	1	Electronica 2024
2025	12	5	Czech Republic, Germany, Hungary, Poland, Slovakia	10	3945	10	1	EMS & PCB Forum
2025	14	1	India	13	?	4	1	Productronica / Electronica India 2025
2026			TBD					

*Excluding flights