



HIGH QUALITY DEMAND DRIVEN SKILLING IN INDIA

Electronic Manufacturing

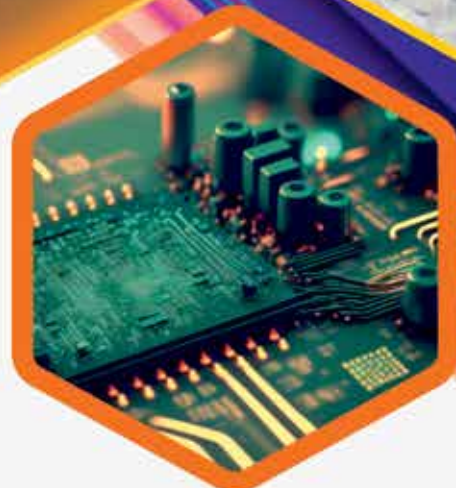
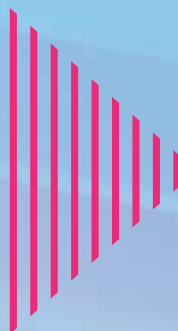
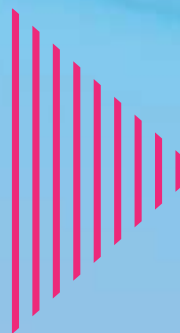


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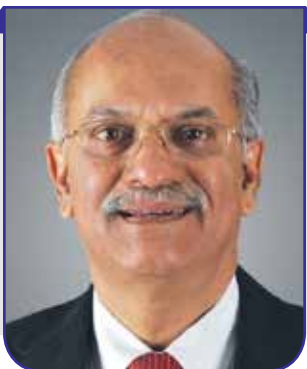
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FICCI SKILL DEVELOPMENT LEADERSHIP



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FOREWORD



FICCI skill development committee has been at the forefront in promoting and aligning with the national skills and education agenda of the Government of India. Since the inception of the skill committee in 2007, we have been the industry's voice for policy recommendation and changes.

We are happy to release the knowledge report on **“High Quality Demand Driven Skilling in India: Focus Electronics Manufacturing Sector”** at the **14th edition of the Global Skills Summit**. The report is an in-depth analysis of the sunrise sector which includes insights from industry leaders from various geographies of our country. Through this report, FICCI and KPMG have attempted to address the issues of demand and supply of skilled manpower in the sector along with projections. The report has come at an opportune time when we are witnessing growth and demand in this upcoming and promising sector.

While on one hand we see an incremental demand of approx. 1.2 Million jobs being created in this sector in the next 5 years, we also face the challenge of skilling the manpower on new technologies and high end skills. The report is an attempt to identify and engage with industrial clusters (which we did during the interviews) and with institutions with the objective of linking the industrial manpower demands and institutional supply. However, the findings reveal that the pathway needs deeper understanding and collaboration between the industry and the institutions. We have highlighted challenges and suggestions at the end of the report.

This report is a first step towards enabling a deeper connect between the industry and institutions. There is a strong need to continue engaging with them so that we are able to address the issues of local supply of skilled manpower, migration, costs of recruitment, hands on skilling on updated technologies and industry driven high quality skilling of youth.

Though the focus of this report is on the Electronics Manufacturing Sector (given the fact that is a growth sector), however many of the aspects and recommendations would be relevant to other sectors as well. In short the report has attempted to identify the direction and the way ahead to enable high quality demand driven skilling in India become a reality.

I would like to thank the Co-chairs and members of the Skill Development Committee for their time and inputs on this report. A special mention to team KPMG for working with us on this knowledge paper. Through widespread advocacy, FICCI's vision is to catalyse the National Skilling Agenda into a nationwide movement and contribute in making India **‘The Skill Capital of the World’**.

I am confident that the information provided in the report will prove extremely relevant to the stakeholders and stimulate thoughts to identify answers to critical challenges. It is evident that convergence of efforts at different levels will be the key for successful outcomes.

Thanks and regards

Mr K Ramakrishnan, Chair - FICCI Skill Development Committee and Chief Executive -Skill Development Mission, Office of the Group Chairman, Larsen & Toubro Limited



Narayanan Ramaswamy, National Leader
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During our discussion on the orientation of skill development in India in FICCI skill committee, there was a unanimous opinion that the country needs purpose-driven or demand-driven skill development at this juncture. It was decided that we pick one sector as a case-in-point to delve deeper into the current and future demand and look at how education and training institutions are catering to this demand. In this context, we, at KPMG are pleased to partner with FICCI in bringing out a paper titled **“High Quality Demand Driven Skilling”**.

India’s electronic sector has witnessed exponential growth over the past few decades, emerging as a global hub for hardware manufacturing, software development, and innovation. However, this remarkable progress is shadowed by the persistent and widening skill gap that threatens to impede the sector’s trajectory. In the rapidly evolving landscape of the electronic sector in India, the issue of skill gap stands as a critical challenge that demands our immediate attention. To accelerate the growth in electronic manufacturing sector, it is estimated that 60 lakh skilled manpower would be required by 2025. Skilling and upskilling large number of individuals to bolster the sectoral growth is a challenging task.

This paper highlights multifaceted dimensions of the electronic sector and intricacies of the skill gap challenge. It attempts to analyse root causes for this gap, ranging from shortcoming in the education system to the rapid technological advancements that constantly outpace skill development efforts. It further examines the consequences of this gap, from hindered innovation to lost economic opportunities.

Towards the end, the paper offers a few suggestions short and long-term strategies to bridge this gap. It highlights the need for a concerted effort from government, industry, and academia to align their agendas and create a robust ecosystem for skill development. A key factor that emerged prominently is the importance of adaptability and lifelong learning in the face of ever-evolving technologies.

The electronic sector has huge potential to drive economic growth, and subsequently act as catalyst for societal development. By addressing the skill gap, we can unlock the true potential of this sector and its contribution to nation-building.

We should look at similar approach to other promising sectors to identify the skill gaps across levels and work with the supply side players to be more agile and create avenues to constantly address this gap.

I wish to thank FICCI for giving us this opportunity and all industry leaders in electronic industry, who lent their valuable time in discussing industry trends and skill gaps.

ABBREVIATION



Acronym	Abbreviation
AICTE	All India Council for Technical Education
BOPP	Biaxially Oriented Poly Propylene
CAGR	Compound Annual Growth Rate
CoDB	Cost of Doing Business
DGT	Directorate General of Training
EDF	Electronic Development Fund
EEE	Electrical and Electronic Equipment
EMC	Electronics Manufacturing Cluster
EMS	Electronics Manufacturing Services
EOU	Export Oriented Units
EP	Electropreneur Park
EPCG	Export Promotion Capital Goods
ESDM	Electronics System Design and Manufacturing
ESSCI	Electronics Sector Skills Council of India
FDI	Foreign Direct Investment
FICCI	Federation of Indian Chambers of Commerce and Industry
GDP	Gross Domestic Product
GVA	Gross Value Added
HEI	Higher Education Institute
ICT	Information and Communication Technology
IESA	India Electronics & Semiconductor Association
IGST	Integrated Goods and Service Tax
IMEC	Interuniversity Microelectronics Centre
IP	Intellectual Property
IT	Information Technology
ITES	Information Technology Enabled Services
ITI	Industrial Training Institute
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LSEM	Large-Scale Electronics Manufacturing
MEITY	Ministry of Electronics and Information Technology

MoE	Ministry of Education
MOOWR	Manufacturing & Other Operations in Warehouse
MSDE	Ministry of Skill Development and Entrepreneurship
MSME	Micro, Small and Medium Enterprise
NABARD	National Bank for Agriculture and Rural Development
NASSCOM	National Association of Software and Services Companies
NCR	National Capital Region
NCVET	National Council for Vocational Education and Training
NIESBUD	National Institute for Entrepreneurship and Small Business Development
NPE	National Policy for Electronics
NPTEL	National Programme on Technology Enhanced Learning
NSDC	National Skill Development Corporation
NSE	National Stock Exchange
NSTI	National Skill Training Institute
PCB	Printed Circuit Boards
PCBA	Printed Circuit Board Assembly
PLI	Production Linked Incentive
R&D	Research & Development
SEZ	Special Economic Zone
SIDBI	Small Industries Development Bank of India
SPECS	Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors
SSC	Sector Skill Council
SSG	Skills Future Singapore
STEM	Science Technology Engineering and Mathematics
STPI	Software Technology Parks of India
SWAYAM	Study Webs of Active Learning for Young Aspiring Minds
TASK	Telangana Academy for Skill and Knowledge
TVET	Technical and Vocational Education and Training
USD	United States Dollar

EXECUTIVE SUMMARY



The electronic sector in India has experienced significant growth and momentum in recent years, positioning itself as a key contributor to country's economy. At present India holds 2% of the global market share and its ESDM market is expected to increase at a CAGR of 17.10% by 2028, owing to strong demand, increased digitalization, and supportive government policies. To fuel the growth trajectory of the sector in a sustained manner, the Government of India had initiated the National Policy on Electronics (NPE 2019) to position itself as a global ESDM hub. Schemes like Make in India initiative, Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPEC), Modified Electronics Manufacturing Cluster 2.0 (EMC 2.0) have strengthened the sector expansion. In addition to policy formulation, several initiatives like Electronic Development Fund (EDF) which supports research, development, and innovation along with MEiTY funded Electropreneur Park (EP) which acts as an incubation center have been key drivers for the sector.

While the central government is making forward looking policies, the states through its dedicated policies and incentives are also contributing to the sector. State such as such as Tamil Nadu, Telangana, Karnataka, Gujarat, Maharashtra, etc have established dedicated ESDM cluster and as a result companies like Foxconn, Wistron, Pegatron have committed to invest in the state.

To fuel the growth of the sector, it is crucial to create a pool of skilled professionals for the sector. However, at present there is gap between demand and supply of skilled resources for the sector. At present, ~15,000 Industrial Training Institutes (ITIs) affiliated with the Directorate General of Training (DGT) are operating in States/UTs to supply entry-level employees to the sector. In addition, various states are implementing dedicated skilling programs, such as the setting up of Telangana Academy for Skill and Knowledge (TASK), Naan Mudhalvan scheme to train 10 lakh youth in Tamil Nadu, etc.

However, the growth of the ESDM sector is restricted due to challenges that can be broadly categorized into industry-level challenges, policy related challenges, and challenges in development of a skilled workforce. These challenges accordingly require targeted set of interventions and solutions to unleash the potential of domestic ESDM sector. A study of global best practices and pathways reveal that country leaders in the global market achieved their position of market dominance through interventions such as priority towards public-private partnerships for training and certification of workforce (Taiwan), heavy investments in STEM education and research centers (South Korea), partnerships with universities and development of talent pool (Singapore), etc.

Based on stakeholder insights through interviews with industry experts and secondary research it is clear that various strategic interventions are required to bolster the growth of ESDM sector in India. Some of the specific measures/interventions required would be in the form of curriculum, nurture industry-academia collaboration and synergy, faculty training, improvements in R&D, standardization of certifications, entrepreneurship support, etc.

INTRODUCTION



2.1 Background and definition

The electronic industry is one of the fastest and largest growing industries across the globe. The advent of pandemic, revolutionizing digital technology and work automation has further catalyzed constant digital connects. Electronic product more than ever impacts and shape our daily lifestyle. The Electronics System Design & Manufacturing (ESDM) industry includes electronic hardware products and components relating to information technology (IT), office automation, telecom, consumer electronics, aviation, aerospace, defense, solar photovoltaic, nano electronics, and medical electronics¹. It also includes design related activities such as product/ chip/ board designing and embedded system.

2.2 Growth of ESDM sector

The growth potential and strategic importance of the electronics industry has been widely acknowledged by the Government of India in the National Policy for Electronics, 2019 (NPE). NPE was launched with a vision to position India as a global hub for Electronics System Design and Manufacturing (ESDM) by creating an enabling environment for the industry to compete globally amongst others. Moreover, **ESDM industry has been included among 25 priority sectors in the Make in India initiative of the government**². India has also emerged as one of the largest markets of electronic product in the world³. As per reports⁴, India's per capita disposable income and private consumption has doubled between FY 2012-FY2022. **The global electronics industry is estimated at USD 1,028.00 billion in 2023.**⁵

Technology transitions with rollout of 5G networks and Internet of Things (IoT) are driving the growth of the electronic market. With a current (2022-2023) market valuation of Rs. 14,000 crores, India is poised to become a Rs. 1 Lakh Crores digital economy by 2026⁶. With the sector getting high importance from Government of India, other factors that are preparing India to face the stiff global competitions include emerging technologies (5G, IoT/ sensors, artificial intelligence (AI) and machine learning), rapid automation, localization of supply chain that reduces imports, lowers costs around miniaturization of multiple devices and small scale devices.

2.3 Global trend, market growth in India

There are over 1000 ESDM companies globally, however over 53% of the market is held by ten companies based in China, Taiwan, and USA. China leads the EMS market with 47% market share, while India stands at 2%. Southeast Asia accounts for about 7%, with Vietnam, Cambodia, Malaysia, Thailand, and Indonesia aggressively growing their market share. To consolidate the Indian electronic industry, Government of India, over the past few years has been focusing on strengthening various relevant sub-sectors such as mobile phone, consumer appliance, chips and semiconductor, EV, etc. Indian semiconductor industry for instance, as per statistics and research metrics, was worth nearly USD 23.2 billion in 2021 and is further projected to reach USD80.3 billion by the year 2028, growing at the CAGR of 17.10% in the forecast period. India has been growing its foothold to become semi-conductor manufacturing hub and it is estimated to generate 12 lakh jobs⁷. Currently, the top 5 destinations for India's electronic exports are the USA, UAE, China, Netherlands, and Germany.⁸

¹IBEF Presentation

²'Make in India' Programme (pib.gov.in)

³doc20221247801.pdf (pib.gov.in)

⁴doc20221247801.pdf (pib.gov.in)

⁵Consumer Electronics - Worldwide | Statista Market Forecast

⁶Consumer Electronics - Worldwide | Statista Market Forecast

⁷Indian semiconductor industry to generate 12 lakh jobs - The Hindu BusinessLine

⁸IBEF Presentation

2.4 Indian government policy for boosting ESDM sector

Keeping in line with the Make in India initiative as well as NPE 2019, multiple schemes have been launched to bolster efforts towards creating USD 300 billion by 2025-2026 in ESDM as envisaged in NPE 2019. Schemes like Production Linked Incentive (PLI) give companies opportunity to establish manufacturing plants in India through 100% FDI. Schemes like Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPEC) provide 25% of capital expenditure while Modified Electronics Manufacturing Cluster 2.0(EMC 2.0) offers support for developing state of art infrastructure amenities. In addition, the Electronic Development Fund (EDF) has been set up to provide research, development, and innovation in such technology-driven sectors.

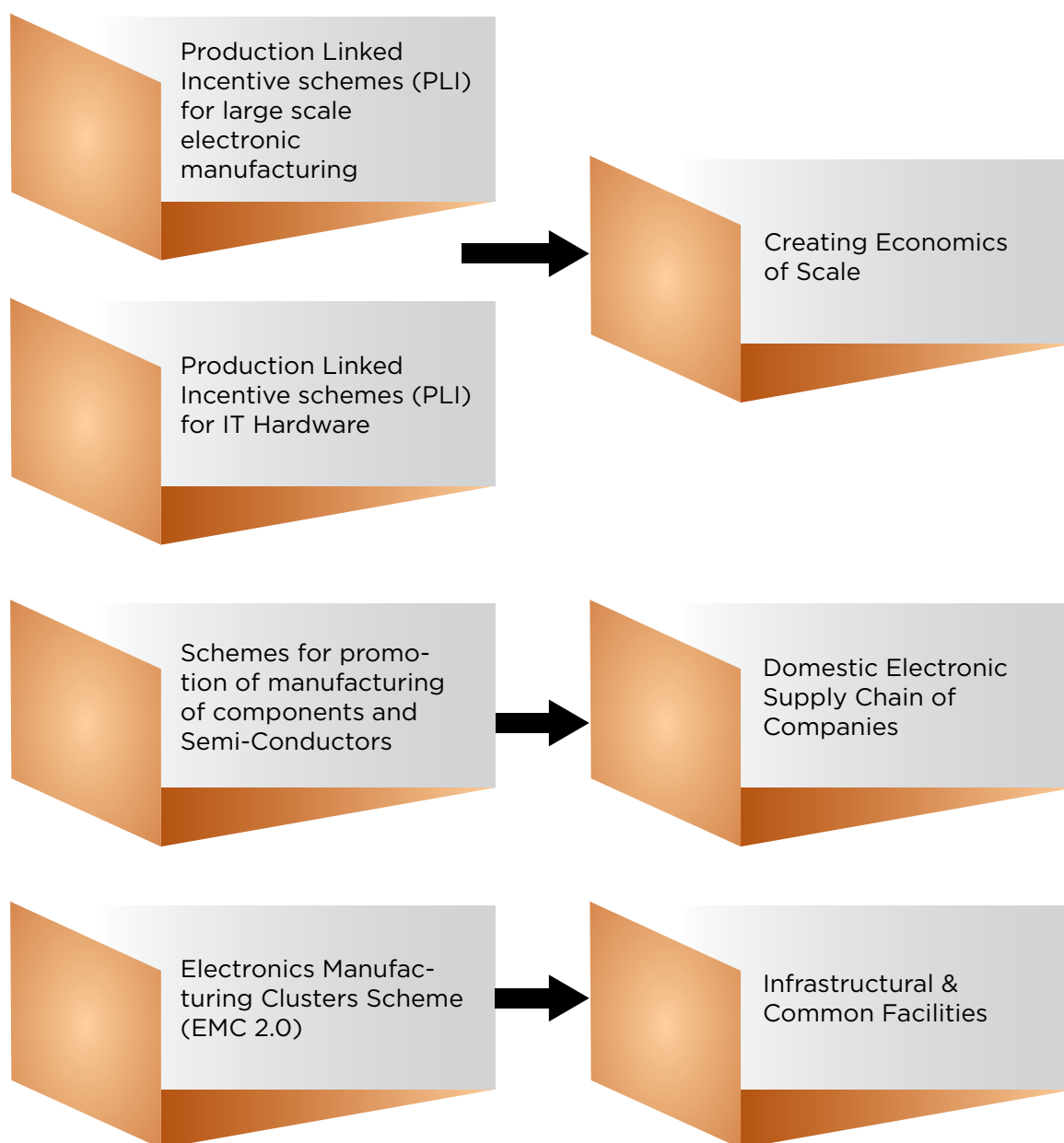


Figure 1: Electronic manufacturing schemes and purpose

The Government has also approved Electropreneur Park (EP) an incubation centre funded by Ministry of Electronics and Information Technology (MeitY), which is further managed by various key stakeholders such as Software Technology Parks of India (STPI), with University of Delhi as the academic partner and India Electronics and Semiconductor Association (IESA) as the implementation partner. The initiative has a portfolio of Rs.21.10cr, which focuses on intellectual property (IP) creation and product development for value addition to domestic manufacturing in the field of Electronics System Design and Manufacturing (ESDM)⁹. Keeping in line with its commitment to strengthen the sector, the Union Budget 2023-24 has allocated Rs. 16,549 crore (USD 2 billion) for the Ministry of Electronics and Information Technology. The government has allocated Rs. 3,000 crore (USD 362.9 million) for the Indian Semiconductor Mission in the Union Budget 2023-24.

2.5 Skill gap in electronic manufacturing sector

Skilled manpower is critical to funnel the exponential growth in the sector. Recent geopolitical issues and challenges has seen many companies shifting its base from China to adjoining countries of Vietnam, Taiwan, and Thailand. India can leverage on this opportunity at two levels, first by attracting investors, secondly by providing skilled labourers. As per the report of the Electronic Sector Skill Council, India is expected to employ more than 60 lakh people by the end of 2025-26.

2.6 Creating skilled workforce

Globally, Taiwan has been successful in building a skilled workforce by establishing public-private partnerships that focus on training and certification. Similarly, South Korea has invested heavily in science, technology, engineering, and mathematics (STEM) education and has established research centers to develop new technologies. If India wants to keep in sync with emerging demand of sector it would need to converge efforts of industry, academia as well as research/ innovation hubs.

However, efforts would have to be made towards integrating emerging technologies across courses offered by engineering and vocational institutes. Electronic manufacturing cuts across multiple domains due to automation, use of AI and technological advancement. Students learning electrical wiring would also have to be taught about automatic switches or given an overview of the home automation process.

Training in emerging and newer job roles would have to be offered. Creating a pool of large skilled labor force would reduce turnaround time for manufacturing units and make it a lucrative destination for investors.

Taiwan case study

- Chipmaking makes 15% of Taiwan's GDP
- Taiwan Produces over 60% of world's semiconductors and over 90% of most advanced ones
- Taiwan's export of integrated circuits was US\$ 184.1 billion in 2022, accounting for 38.4% of total export value.
- Between 2011-2022, Taiwan consistently ranked 1st globally in foundry and packaging & testing, and design behind USA.

⁹ Electropreneur Park, New Delhi season 9 | Software Technology Park of India | Ministry of Electronics & Information Technology Government of India (stpi.in)

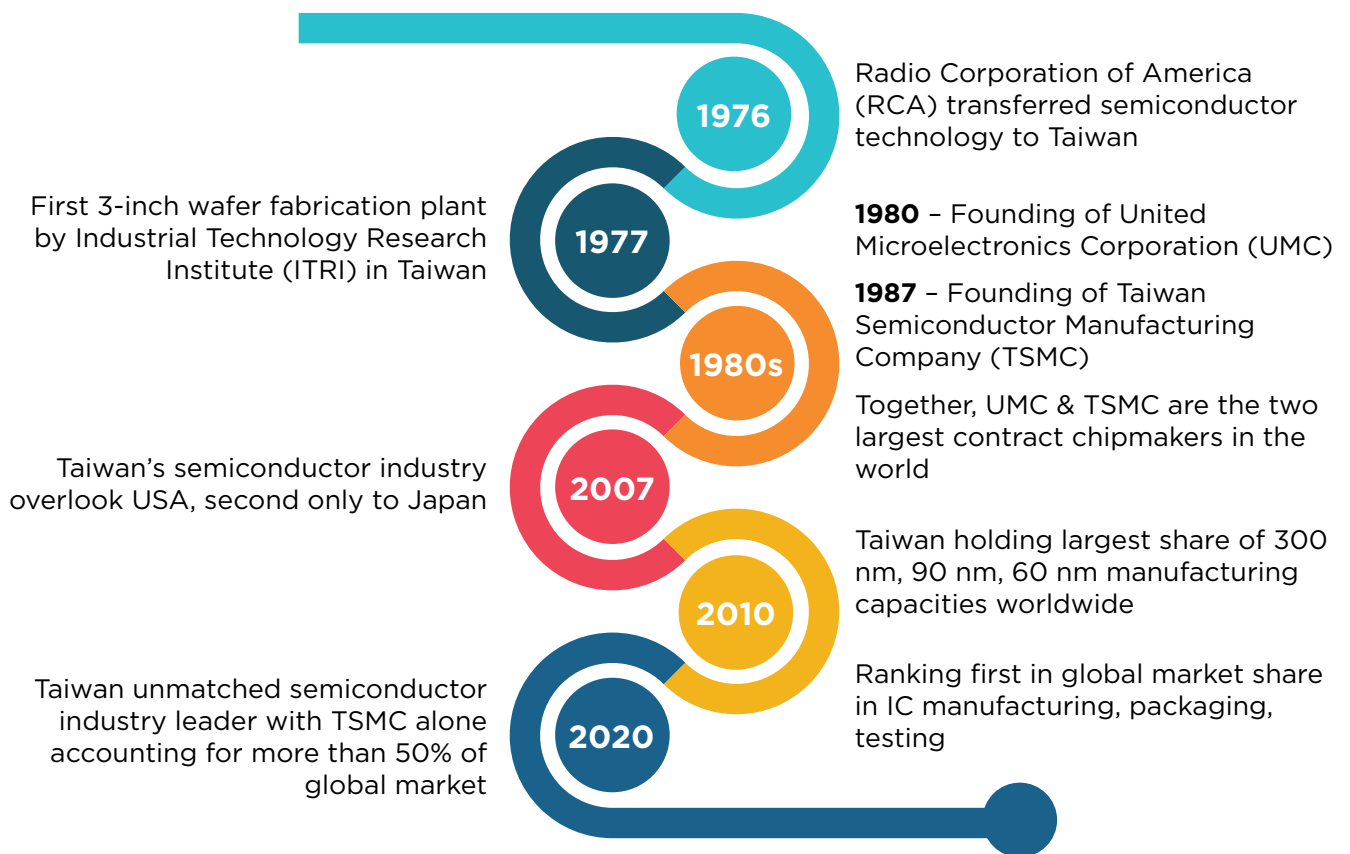


Figure 2: Growth Timeline of Taiwan's semiconductor industry

Present day drivers of thriving industry

- Early priority towards IT transformation of economy since 1970
- Strong capabilities in OEM wafer manufacturing
- Complete industry supply chain
- Systemic priority towards cultivation of talents through training
- Strong governmental support for semiconductor industry

Key takeaways for India

- Focus on promoting teaching excellence through faculty development
- Strengthening faculty practical training exposure
- Infusion of industry resources for collaborative TVE teaching
- Encouraging student to participate in various competition
- Strong industry-academic collaboration
- Establishing regional industrial academic cooperation center

2.7 Cluster leading in ESDM Sectors

At present there are 7 clusters across the country which are spearheading the ESDM industry:

NCR - Gurugram

NCR- Noida, Greater Noida

Maharashtra - Pune

Karnataka - Bengaluru, Mysuru

Tamil Nadu- Sriperumbudur, Chennai

Telangana - Hyderabad

Andhra Pradesh - Sricity, Tirupati

These clusters are hubs for over 20+ industries. Under Karnataka cluster Foxconn has signed an agreement with the state government to set up an Apple factory in the state. It is estimated to create 1 lakh jobs¹⁰. Recently, Hon'ble Prime Minister has also extended invitation to two major American chip makers, Micron Technology and Applied Materials to set up their manufacturing unit in India. Each of these clusters is slated to propel the ESDM growth by providing requisite economies of scale.

2.8 Challenges and way forward

India currently stands at a crossroad of creating a dynamic space for leveraging growing electronic manufacturing sector while at the same time reaping its demographic dividend. To reach the USD 300 billion mark by 2025-2026, we need to work on parallel front of creating/ updating our job role specific curriculum, bringing in academic and industry together to skill youth.

However, many of our challenges lie in increasing labor-intensive manufacturing components, which currently are being imported from different countries. As per Vision Document 2.0 of Electronic Policy¹¹, India even *'lacks in manufacturing of components that are labour intensive and are feasible to manufacture in India, given the availability of cheap and skilled manpower. An active policy support to promote local manufacturing, including through domestic players, appears to be missing at present'*¹².



¹⁰ Foxconn to set up Apple phone manufacturing unit in Karnataka, inks pact | Bangalore News, The Indian Express

¹¹ doc20221247801.pdf (pib.gov.in)

¹² Why is India no electronics hub like China? Govt cites high tariffs, no subsidies as challenges (theprint.in)

DEMAND AND SUPPLY OF SKILLED MANPOWER IN ESDM



3.1 ESDM market growth in India

Despite the high reliance on imports, India's electronics sector has witnessed rapid growth. India at present is the 2nd largest smartphone market, has the 5th largest installed capacity of renewable energy, sells 4 million+ passenger and commercial cars annually and is a fast-growing e-commerce market (USD 85 billion by 2023)¹³. In recent times, the sector has received momentum from its demography change in consumer behaviour, increase in purchasing power and rise of disposable income. India provides a worldwide opportunity for short to medium-term growth in consumer electronics spending¹⁴. Domestic production of electronics is valued at USD 87 billion in FY22 and is segmented as Mobile Phones (43%), IT Hardware (5%), Consumer Electronics (12%), Strategic Electronics (5%), Industrial Electronics (12%), Wearables & Hearables (0.3%), PCBA (0.7), Auto Electronics (8%), LED Lighting (3%) and Electronic Component (11%).¹⁵

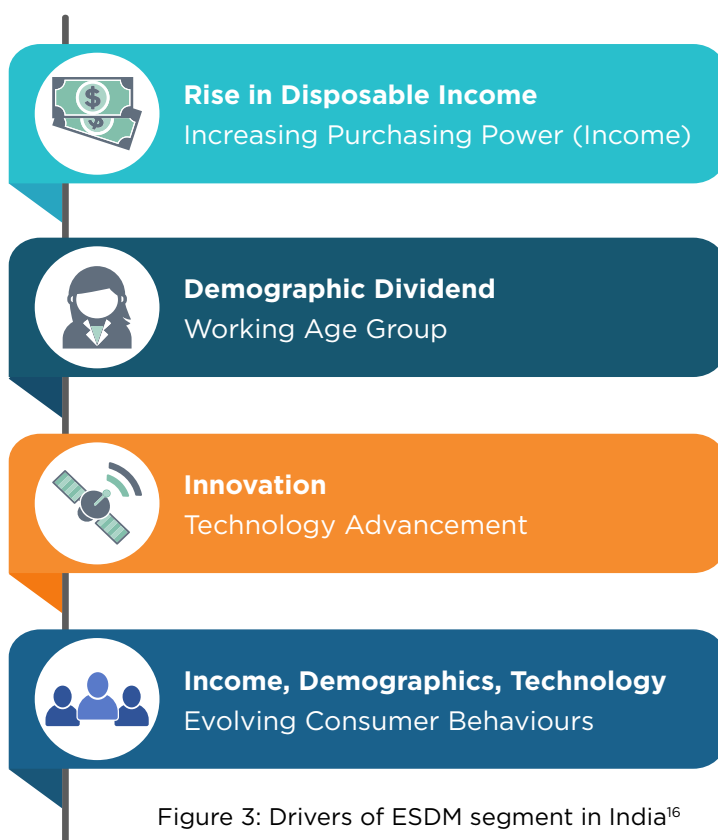


Figure 3: Drivers of ESDM segment in India¹⁶

¹³ Electronic Industries Association of India (elcina.com)

¹⁴ India Consumer Electronics Market Size, Share Report, 2030 (grandviewresearch.com)

¹⁵ Electronic Industries Association of India (elcina.com)

¹⁶ KPMG analysis

3.2 Government policies/initiative to bolster the sector

Further, to strengthen the electronic ecosystem and to develop a robust electronics manufacturing infrastructure, Government of India has encouraged various states to establish dedicated electronic manufacturing clusters¹⁷ at strategic locations. These clusters in collaboration with various industries are responsible for identifying growing sub-sectors in the electronics value chain and facilitate the development of the requisite infrastructure such as developed industrial land, Plug & Play Industrial sheds, uninterrupted Utilities (Power, water, Gas, ETP/STP etc.), including logistics connectivity¹⁸. Further across states grant have also been given to provide financial assistance for setting up of EMC projects and Common Facility Centres (CFCs) across the country.

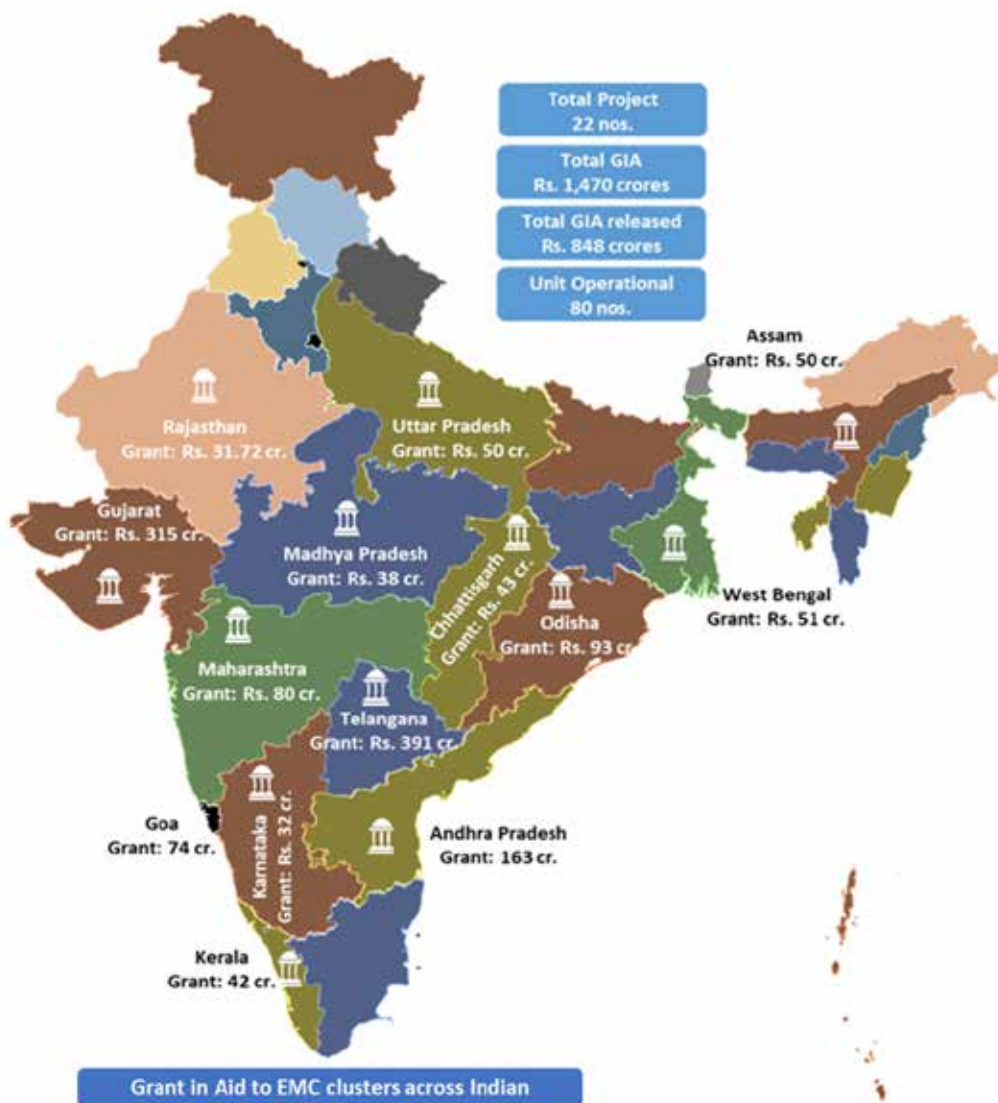


Figure 4: As per EMC project monitoring data, total 22 projects across various States such as Karnataka, Maharashtra, Telangana, Chhattisgarh, Odisha, West Bengal etc., are approved with a total outlay of Rs. 3498 crores. Till date, Government has approved sanctioned grant of Rs. 1470 crores (depicted in above image) and grant releases till date is Rs. 848 crores.¹⁹

¹⁷ Dashboard (emcpms.gov.in)

¹⁸ Electronic Industries Association of India (elcina.com)

¹⁹ Dashboard (emcpms.gov.in)

PLI Scheme Implementation	Impact of policy intervention ²⁰
Rs 625 Crore Investment under PLI Scheme (Till March 2023)	<ul style="list-style-type: none"> • Incremental production / sales over Rs 6.75 Lakh Crores • Employment generation for around 3.25 lakh people
Rs 2,900 Crore incentive disbursed for 8 sectors (In FY 2022-23)	<ul style="list-style-type: none"> • Government prioritization and incentivization for 8 sectors: LSEM, IT Hardware, Food processing, drone and drone components, bulk drugs, medical devices, pharmaceuticals, telecom & networking products • Shifting of suppliers of major smartphone companies to India (Foxconn, Wistron, Pegatron) • 20-fold increase in women employment • Localization in IT Hardware (battery, laptops)

3.3 Skilled manpower requirement in ESDM

To augment the growing needs of the sector the Electronic Sector Skill Council [ESSC] estimates that 60 lakh skilled manpower would be required by (2025-26)²¹. India's vast pool of engineering college, and robust vocational education system has all the making of being the skill capital of world.

3.3.1 Efforts made for skilling manpower

To provide the skilled manpower for the sector, multiple skill development schemes both at center and state level have been working in tandem. As per the number reported by ESSC 18.55²² lakhs candidates have been trained across 100+ job roles spanning 700+ district in electronic sector. Of the total trained candidates, 09 lakhs have been reported placed across ~1200 industry partners. In addition, states like Telangana and Tamil Nadu are implementing state schemes aimed specifically at expanding skilled manpower for electronic sector. Telangana has established Telangana Academy for Skilled Knowledge (TASK) to create skilled manpower in the state. TASK has also tied up with multiple industries to offer courses which have been developed along with industry experts.

Sub sectors within ESDM

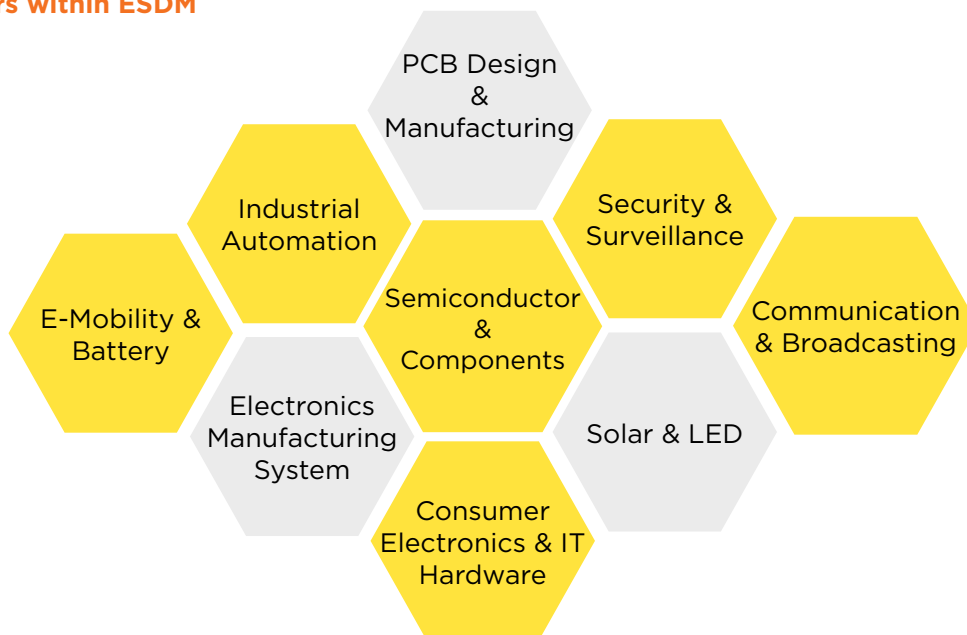


Figure 5: Sub sectors within ESDM

²⁰ pib.gov.in/PressReleaselframePage.aspx?PRID=1932051

²¹ [essc-india.org/pdf/Report-ESDM Labor Market Information Survey.pdf](https://essc-india.org/pdf/Report-ESDM_Labor_Market_Information_Survey.pdf)

²² As of July 2023

Tamil Nadu has launched a massive upskilling program called “Naan Mudhalvan” on 1st March 2022, with an aim to equip about 10 lakh youth across the State annually with skills that will help them realize their talents for the benefit of the country. Government has onboarded 50+ industry partners and 180+ organizations to offer jobs, internships, trainings, and mentor connects including Microsoft, Tata Consultancy Services, Oracle, CISCO, Schwing Stetter, Salesforce, UrbanClap, NSE Academy, NASSCOM, L&T Edutech, Infosys Springboard, Times Group, Tata Motors among others.

In long term skilling eco-system ~15,000 ITIs affiliated with Directorate General of Training (DGT) (~38% Govt. and ~62% Pvt.)²³ are providing the sector with entry level employees. Out of these ITIs, 66% are in the States of Uttar Pradesh, Rajasthan, Karnataka, Bihar, Madhya Pradesh, and Maharashtra. These ITIs offer only entry-level job roles in EMS such as electrician, fitter, welder, electronic mechanic, etc and however, ~ 68% of the total seats related to electronics sector remain vacant. Only the State of Karnataka²⁴ has enrollment across electronic related job roles/trades, which could also be attributed to it being the oldest tech capital of the country.

3.4 International best practices for creation of skilled manpower

Countries like Singapore and South Korea have attracted global semi-conductor industry by developing their talent pool, establishing research centers, partnering with universities and in a long-term investing in their education system. These models and best practices can be dovetailed as part of overall policy in our context as well. In absence of skilled manpower, companies cannot succeed. Skilled manpower strengthens companies to design and develop new product, enhance quality control, and improve productivity.



²³ KPMG analysis

²⁴ DGET MIS (ncvtmis.gov.in)

Singapore case study

SkillsFuture Singapore (SSG) under the Ministry of Education of Singapore is a statutory body promoting skill development and lifelong learning via the creation of a responsive, continuing education and training ecosystem. The SSG scheme was initiated under the SkillsFuture Agency Act, 2016.



Scheme components

- SkillsFuture Credit: For ensuring access to learners (Singaporeans above 25) by offset of training course fees
- SkillFuture Mid-Career Enhanced Subsidy: Higher course fee subsidies to Singaporeans aged 40 and above
- SkillFuture Series: Short industry-relevant training for emerging skills in Care, Digital, Green and Industry 4.0 economic pillars
- Skills and Training Advisory Services: One-to-one consultation with Skills Ambassadors to guide learners' skills and training needs
- SkillFuture Queen Bee Networks: Industry leaders who take on a leading role to champion skills development in organizations, particularly for the Small and Medium Enterprises (SMEs)
- SkillFuture Work-Study Programmes: Work study pathways to help students achieve their career aspiration



Aspects of implementation

- Training opportunities for early as well mid-career professionals, including a special "train-and-place" initiative to improve employment.
- Initial two-year pilot to popularize the SkillFuture Credit packages and then gradually expand usage to all digital learning platforms.
- Annual SkillFuture month and Study Fair with activities to meet the diverse needs of workforce segments, students, enterprises.
- Surveys to assess the quality of training from funded training providers; and to measure employers' satisfaction with the programmes.
- Report providing the Singapore workforce with timely insights into 3 key economic growth areas (Digital, Green, and Care Economics).



Impact over 5 years

- About 6,60,000 individuals and 24,000 enterprises benefitted from SSG programs
- 960+ enterprises registered in National Centre of Workplace learning
- About 2,47,000 Singaporeans availed SkillFuture credit
- 10,000+ enterprises sent employees for SSG supported training availing the SkillFuture Enterprise Credit scheme
- 500+ companies and close to 1700 individuals participated in the SkillFuture work study programs
- 22000+ individuals availed SkillFuture for digital workplace
- 500+ enterprises registered for SkillFuture Queen Bee
- About 7200 individuals availed Skills and training advisory
- 28000+ individuals availed SkillFuture Advice

Key takeaways for India

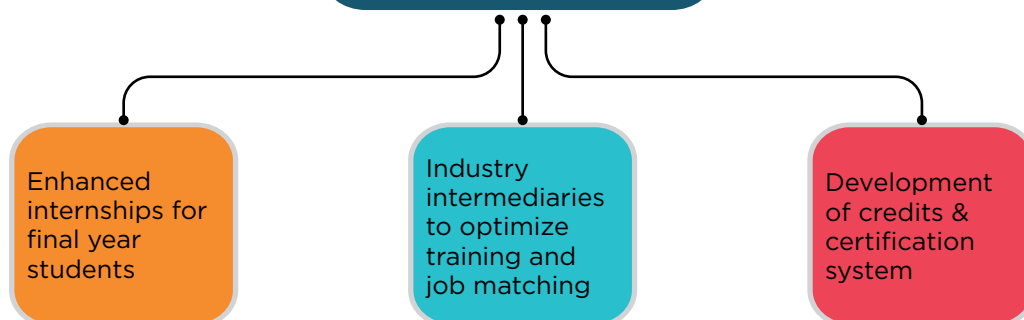


Figure 6: Case study - Singapore

CHALLENGES IN ESDM SECTOR – INDUSTRY, POLICY, AND WORKFORCE



The task faced by ESDM ecosystem in India is the simultaneous expansion of domestic capacity through labs, facilities, etc., while also plugging into the global supply chains and gaining larger foothold. Some of the challenges at present restricting the Indian ESDM sector from achieving faster growth are:

4.1 Industry challenges (addressing concerns of industries to optimize on opportunities)

Cost of Doing Business (CoDB) - The CoDB Index developed by KPMG²⁵ comprises of primary cost index (equal weightage given to hourly compensation costs, corporate tax rates, real estate rates, utility costs, interest rates) and secondary cost index (equal weightage given to quality of labor, ease of doing business, infrastructure, risk and protections).

Countries	Quality of labor score	Ease of doing business score	Infrastructure score	Infrastructure-Transport score	Infrastructure-Utility score	Risk and protections score
United States	1.67	2.00	2.22	2.00	2.67	2.00
Switzerland	1.67	1.67	2.44	3.00	2.33	2.75
United Kingdom	2.67	2.33	2.25	2.75	3.00	1.50
Canada	2.33	2.33	2.42	3.25	3.00	2.00
Germany	1.67	2.67	2.28	2.50	2.33	2.50
South Korea	2.33	3.33	1.50	1.50	2.00	2.00
Taiwan	3.00	2.33	2.78	3.00	2.33	1.75
Japan	2.33	3.00	2.25	1.75	2.00	2.50
Ireland	1.33	3.00	3.58	4.75	3.00	2.25
France	2.67	3.00	2.69	2.75	2.33	2.25
Malaysia	3.33	2.33	3.06	2.50	3.67	3.00
Italy	3.33	3.00	3.50	3.50	3.00	3.00
China	3.67	2.33	3.64	2.25	3.67	3.50
Mexico	4.33	4.00	4.44	4.00	4.33	4.25
India	5.00	4.33	4.42	3.25	5.00	3.75
Vietnam	4.67	4.33	4.31	4.25	4.67	4.75
Brazil	5.00	5.00	4.47	4.75	4.67	4.75

Figure 7 - Secondary index cost factor scores (KPMG LLP, 2020)

²⁵ Cost of manufacturing operations around the globe (kpmg.us)

The cumulative score of India (3.49) in comparison to other countries, reflects the disadvantaged position of domestic ESDM industry with regard to doing business. India scored 2.60 and 4.38 on both primary and secondary cost indexes respectively (1 being the best and 5 being the worst score).

4.1.1 Raw material availability

There are various raw materials such as epoxy, indium tin oxide, BOPP film, silicon dioxide, CC laminates, etc. that Electronics Manufacturing (resistors, capacitors, PCBs, transformers and inductors, LCD panels and display, etc.) is heavily dependent on import. Except for few, nearly all raw materials that the industry is reliant on are imported (Government of India, 2023)²⁶. This overall negatively impacts the sector in following ways:

- It increases the dependence of companies on suppliers, which are at present predominantly from China
- It also increases the overall cost and time overhead of production

ESDM companies can ensure better supply chain management and control by setting up and strengthening domestic facilities, which also creates the potential for margin expansion at later stages.

4.1.2 Working capital

Electronic products are manufactured through the assembly of multiple components, and unavailability or delays in sourcing components can affect production. ESDM manufacturing is a complex process with very low potential of switching suppliers due to sourcing based on highly detailed specifications. Due to this, companies may also face challenges of inventory management that affects working capital as high inventory stock management is required to ensure no disruptions within the supply chain.

4.1.3 E-waste management

Interviews with ESDM industry leaders reveal growing concerns around the management of e-waste. E-waste is comprised of 21 types of Electrical and Electronic Equipment (EEE) notified under e-Waste (Management) Rules, 2016. Only 22.7% e-waste out of total 10 lakh tons waste generated in India in 2019-20 was collected, recycled, or disposed properly²⁷.

4.2 Policy challenges

4.2.1 High import duties

In electronics and related manufacturing, components are often imported and kept in warehouses. In the Finance Bill 2023, the Government of India has levied 18% Integrated Goods and Services Tax (IGST) on imports of electronics, by removing an exemption on inputs imported with the objective of export production by a duty-free bonded warehouse. Without the removal of input duties on parts for mechanics, connectors, parts of chargers and other electronics manufacturing, the sector is unable to improve upon competitiveness. The impact of forward-looking policies is visible in the development of Vietnam's ESDM sector, through implementing a policy of duty exemption, strategic free trade agreements, and other tax incentives to encourage the domestic electronics manufacturing sector and dominate the global market. In contrast, Brazil's policies of high import duties and lack of government support to mitigate the rising cost of production held back the growth of its domestic ESDM industry²⁸.

²⁶ <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1907276>

²⁷ Around 78% of India's e-waste is not being collected or disposed by the government - The Hindu BusinessLine

²⁸ ICEA-McKinsey-Making-India-the-global-manufacturing-powerhouse-for-mobile-handsets-and-components.pdf

These contrasting examples make a clear case for India to adopt conducive policies supporting import of raw materials, incentivizing exports of finished goods, propping appropriate skilling and education infrastructure, etc. as needed by its nascent sector.

4.2.2 Infrastructural planning

China, Vietnam, Taiwan have developed massive manufacturing clusters with accompanying infrastructural facilities such as connected roads, uninterrupted supply of electricity, residential zones, etc. which is yet to be replicated in India to the same scale. The Government of India had launched the Electronic Manufacturing Clusters (EMC) Scheme 1.0 in 2012 to address the issue, and a revised EMC 2.0 has been launched in 2020 to further give impetus to investments in mega manufacturing clusters.

4.2.3 Design/R&D ecosystem

At present India houses a very small R&D ecosystem to support design components in the domestic manufacturing system. Overall education and skilling policy needs to be reoriented with an acknowledgement to the need for creating design institutes, catering to ESDM manufacturing and skills. In 2021, India's gross expenditure on research and development (R&D) as a share of GDP stood at 0.8 percent. At the same time as on 2020, Taiwan expenditure on R&D stood at 3.63% of their GDP and China's investment in R&D as a proportion of GDP reached around 2.56 percent in 2022 (Niti Aayog and Institute for Competitiveness).

4.2.4 Discrepancies in tax regime

The Manufacturing & Other Operations in Warehouse (MOOWR) scheme had been launched by the Government of India to reduce the cost of capital and promote domestic manufacturing by enabling maintenance of working capital. While other initiatives of the Government such as Make in India, Export Promotion Capital Goods (EPCG) Scheme, Special Economic Zones (SEZ), Export-Oriented Units (EOU) continue to have IGST exemption, the same has been removed from MOOWR²⁹, negatively impacting business units operating under the Scheme. Such discrepancies hold disincentivizing signal for ESDM companies and lower the perception of ease of doing business overall.

4.3 Workforce challenges

India currently is facing lack of skilled manpower especially in the segment of semiconductor manufacturing, at present skilled workers are being imported from abroad for setting up semiconductor fab³⁰. Similar findings have also emerged from primary interview conducted with leading industry experts and leaders.

Some of the challenges faced by industry in recruiting skilled manpower are mentioned below:

4.3.1 Labor supply

From 2.5 million in 2021-22, the manpower employed in electronics manufacturing services and e-waste management sectors is expected to grow to 8.1 million by 2025-26 (Electronics Sector Skill Council of India, 2023). The current and projected needs of the ESDM sector require a rapid expansion in the number of colleges, training institutes, finishing schools in the country to meet the demand of employers. In the absence of this ready labor pool, companies are forced to expend additional time and capital in locating trainable candidates and making them job-ready for consistent supply of manpower. Most of the participating industries highlighted their concern about the cost and time (ranging from a few weeks to 12 months) being spent on re-skilling and upskilling even fresh recruits.

²⁹ <https://www.financialexpress.com/industry/micron-flags-tax-concerns-in-india-says-regime-not-aligned-with-global-practices/3131365/>

³⁰ Semiconductor fab: 'Need skilled workers from abroad', says MEiTy scientist- The New Indian Express

4.3.2 Talent attraction

Interviews with industry leaders reveal that companies often face challenges when working with partner institutions such as ITIs, polytechnic colleges as a lot of institutes are transitioning from mechanical, electrical branches towards focusing on IT-sector jobs instead. More than 90% of the aspirants opt for non-electronic trades such as computer science, draftsman, quality analyst/check/test, etc. Approx. 53% organizations report the inability to attract talent as a barrier to business transformation over the next 5 years, particularly in Electronics Sector (Future of Jobs Report 2023).

4.3.3 Low productivity

India's manufacturing productivity (labor productivity in GVA per output per full-time worker; as well as capital productivity) are both low and need to be boosted through targeted skilling, reskilling, upskilling programs and interventions. For example, while India's labor cost is a third of China's, giving it an advantage, India's productivity is also a third of China's (Foundation for Economic Development, 2022)³¹. South Korea's productivity is four times higher than India's, with its electronics manufacturing sector showing 18 times more productivity than India's (McKinsey, 2020)³². To gain a stronger foothold in ESDM manufacturing, the large workforce of India needs to be engaged productively and efficiently.

4.3.4 Talent retention

Talent development through on-the-job training is considered key strategy by 81% employers, particularly in electronics industries. However, post training, more than 30% organizations in the electronics sector report a negative outlook towards retaining talent (Future of Job Report 2023). Lack of awareness regarding a few of the key aspects such as career progression, lodging and boarding, unrealistic assumption of entry-level work profile, and wages are leading to 15-20 % attrition. Industry sources reveal that for some companies, attrition rate in assembly line is lower (5-10%) than in post-sales servicing (30-40%).

4.3.5 Mismatch with industrial needs

There is a significant gap between the skills possessed by the available workforce and skills required by the rapidly evolving electronic manufacturing industry. Rapid growth in the sector often outpaces the availability of skilled labor, leading to shortage. There is a lag in understanding the needs of industry, and until synergy is established between academia-industry connect, resources in training and skilling of same candidate are doubly expended by both HEIs and companies. Industry leaders also flag a disconnect between industry and academia to be a key reason for this gap.

4.3.6 Technical capability

Existing professionals within the sector often exhibit low technical and mechanical skills due to lack of suitable equipment and machinery in higher education and training institutes for practical exposure. Keeping up with advancement in electronic manufacturing technologies is challenging for new and existing workers. While schemes like Internship Embedded Degrees[example], Professors of Practice, Science & Technology Clusters, etc., have been introduced to improve industry exposure of students, there is need of scaling up these schemes rapidly across geographies to make learners workforce ready.

³¹ <https://www.fedev.org/blog/focus-areas/india-electronics-manufacturing-hub/>

³² <https://www.mckinsey.com/industries/industrials-and-electronics/our-insights/a-new-growth-formula-for-manufacturing-in-india>

4.3.7 Soft skills

The workforce engaged in the sector, along with training in technical capabilities, also needs to be adaptable to the evolving expectations of ESDM employees. In the interview, industry partners highlighted that most of the fresh recruits lack basic attributes of soft skills (communication, punctuality, behavior on the work floor or assembly line). Organizations in the electronics sector consider various soft skills to be growing in importance over the next 5 years (2023 to 2027), such as cognitive skills (71.2%), engagement skills (60%), management skills (54.2%), self-efficacy, teamwork, and ethics (66%).

4.3.8 Gender mix

Despite several efforts such as providing transportation, hygienic washrooms, clean water, and stipends (under certain schemes), and equal wages still participation of women especially toward opting for technical trades is very low. 90%³³ of the women's workforce is limited to assembling areas.

4.3.9 Training infrastructure

Limited access to high quality training facilities and programs hampers the development of skilled workers. There is a need to promote and encourage cross utilization of infrastructure across ministries.



³³ Analysis of primaries data

SUGGESTION FOR WAY FORWARD



India in its intent and action through various policies and interventions has demonstrated its commitment to expanding its electronic manufacturing foothold. As a country, we are uniquely positioned, owing to the demographic spread and growing economy.

India can benefit from this growing market, by creating investment-friendly policies while at the same time aiding the newly established industry through skilled manpower. To understand the requirement of ever-expanding electronic sector, in-depth interview was conducted with leaders of prominent electronic manufacturing business to gain perspective on industry manpower requirement. This section has attempted to assimilate the insights from the interviews along with the secondary research conducted. The following are the key recommendations for the stakeholders (including policy makers)

5.1 Revamp educational curriculum

- Curriculum needs to be revamped and updated in line with the industry needs
- Introduce practical, hands-on training modules in electronics and related fields. For example, countries like Germany & UK have dual training system, comprising of theoretical classroom learning with practical on the job training
- Promote research and development activities within educational institutions to foster innovation
- Integrated and cross learning focus across courses

5.2 Industry-Academia Collaboration

- Establish stronger partnerships between academia and the electronic sector to bridge the gap between theory and practice. For example countries like Singapore, Taiwan, China, S. Korea have long established systems of industry partnership
- Create dedicated employability support/placement cells in colleges for networking and facilitating collaboration with industrial bodies
- Establish stronger linkages with regional Science & Tech Clusters, and State Startup Clusters for improving synergy between industry and academia, particularly in relevant and upcoming fields such as systems design, e-waste management, etc
- Within India, few companies such as Schneider, SIEMENS, L&T among other offers skill development training programs which are industry-driven

5.3 Need for demand driven skill development initiatives

- Expand government-sponsored skill development programs specifically tailored to the electronic sector
- Offer subsidies or incentives to encourage individuals to enroll in skill development courses
- Launch state-specific skilling and knowledge creation academies/centers, for giving impetus to state needs and convergence of local institutions

Telangana case study

Telangana's Electronics Policy was launched in 2016 to make it the ideal destination for ESDM Industry through creation of sustainable ecosystem to (i) Attract investments to the tune of USD 3 billion in the Electronics Sector; (ii) Create employment for 0.16 million people; (iii) Enhance production from - USD 1 billion to USD 7.5 billion.

Scheme components
Exemption of Registration, Transfer & Stamp Duty - 100% reimbursement on 1st transaction, 50% on 2nd transaction.
Power Subsidy - 100% exemption on electricity duty for 5 yrs post inception of commercial operations
Assistance in Patent Filing - 50% reimbursement of patent filing costs for Telangana headquartered companies, subject to limit of INR 2 lakh
VAT/CST/SGST Reimbursement - 100% reimbursement for 5 yrs for micro/small companies (subject to INR 5 Cr limit), and for 7 yrs for medium/large/mega companies.
Transport Subsidy - Starting from subsidy of 60% in 1st year to 50%, 40%, 30%, 20% in subsequent years on fuel cost, billing, freight on import of parts/components
Land Cost and Lease Rentals - Land at affordable cost; 25% subsidy on lease rentals for period of 10 yrs.
Interest Subvention - 5.25% per annum on term loan for a period of 5 years or till reaching 50% of the capital involved, whichever is earlier, subject to an overall ceiling of INR 1 crore per unit per annum
Women Entrepreneurs - Additional 10% investment subsidy (maximum of additional INR 10L for MSEs); TASK - INR 5L as recruitment (50 min Employment); 5% subsidy on lease rentals - INR 10 lakh per annum & min of 1,000-10,000 sq. ft. for plug and play model
Support to R&D Institutions: Assistance at 20% of project cost or up to INR 10 lakh, whichever is lower, for sponsored research work

Impact over 5 years

Since 2016, attracted investments of Rs. 50,000 crore from 120 companies in the Electronics, EV and Energy Storage Sectors

Since 2014, employment for over 66,000 people clusters and other notified parks

In the last one year, Telangana has attracted investments of over Rs. 38,000 Crore with an employment generation potential of 32,000 people in the Electronics and Energy Storage Sectors

Paved way to adopt the new ICT Policy 2021-26 in Telangana

Skilling ecosystem in Telangana

Telangana Academy of Skill and Knowledge (TASK) launched in 2014, has trained and deployed over 1,80,000 skilled workforce in the Electronics Industry on a no cost basis. TASK is developing customized training programs and courses with a focus on emerging sector, in consultation with the industry and educational institutions. Forms industrial partnerships with the intent of developing avenues for upskilling, reskilling and also collaborates with the central government to train students

Figure 8: Telangana Case Study

5.4 Continuous learning culture

- Promote a culture of lifelong learning among electronic sector professionals
- Encourage employees to regularly update their skills through workshops, online courses, and certifications
- Launch upskilling modules through affordable and accessible government learning platforms such as NPTEL, SWAYAM, etc. for virtual learning
- For faculty and candidate, all training hours could be consolidated under Academic Bank of Credit. This would ensure all learnings and their outcome are captured on an integrated platform

5.5 Certification and accreditation

- Standardize certification processes to ensure that individuals with relevant skills receive recognized accreditation
- Encourage electronic sector organizations to prioritize hiring certified professionals
- Industry can offer sector specific relevant skilling, training, and certification program in line with global standards and emerging technologies
- A single platform could be created for tracking all technical training a candidate under goes across industry

5.6 Training of trainers/faculty

- Practical and industrial exposure in their field of study for pre-service faculty/trainers undergoing their primary B.Ed. training or other certifications
- Annual refresher courses for training of in-service faculty/trainers on cutting edge R&D in ESDM sector
- Continuous training programs for exposure and training on new machines and technology, along with certification/e-badging for in-service faculty



Gujarat

- Gujarat Electronics Training (GET) Cells: To collaborate with Gujarat Technical University and other premier institutions within state to create industry-oriented cells with the aim of developing relevant curriculum and providing support in reducing the skill gap between industry and academia
- Electronics Industrial Training Institutes (E-ITIS): To strengthen select existing Industrial Training Institutes (ITIs) within the State to facilitate skill development in the Electronics System Design and Manufacturing (Electronics) Sector
- Building internal capabilities through 'Train the Trainer' programs: Support of maximum expenditure up to Rs. 10 Lakh per faculty/trainer
- Apprentice Exchange programs: MoUs with leading electronics manufacturing industry



Kerala

- Kerala Institute for Entrepreneurship Development (KIED) to provide demand driven training program
- KIED to create a talent ready pool
- Cluster-wise Technical Centres of Excellence shall be established in PPP mode with industry bringing in hands-on learning opportunities
- Under the aegis of the Kerala Knowledge Economy Mission, a strong skill infrastructure ecosystem will be created, and soft loans shall be provided students and professionals to undertake advanced courses and trainings
- Skill Development Centres shall be established in association with Industry Associations



Haryana

- Setup a private university: Envisages to develop a world class private university in gurgaon district to spearhead research & development, new product design and innovation activities
- Employment general subsidy: Employment generation subsidy of INR 36,000 per year per employee for a period of 5 years to build capacity of persons (skilled/semi skilled) belonging to haryana in selected blocks
- Skilling: Haryana state Electronics Development Corporation Limited (HARTON) will closely work with various Industries and Industry Associations to analyse the gap and assess on-ground demand of job role
- Faculty training: Aims to train and certify at least 500 trainers annually for the next 5 years



Figure 9: Key initiative for Skill Development by States under EMP

5.7 Incentives to faculty

- Research grants by government prioritizing ESDM sector for encouraging innovation and development by academia
- Incorporation of sound technical report, practical R&D outcome, etc. as evaluation metrics in faculty promotion process
- Prioritization in recruitment of industry experts as faculty (like Professors of Practice scheme). For example, countries like Taiwan encourage institutions to appoint TVET faculty members with practical industrial experience

5.8 Entrepreneurship support

- Facilitate the creation of startups and small enterprises in the electronics sector by providing mentorship, funding, and infrastructure support
- Foster an environment where innovation is rewarded, and risks are minimized

5.9 Government incentives

- Offer tax incentives and subsidies to electronic sector companies that invest in skill development initiatives
- Create special economic zones focused on electronics, attracting investments, and fostering skill development

5.10 Research and development

- Allocate resources for research and development centers focused on cutting-edge electronic technologies. Example: China and Taiwan have significant percentage of their GDP as R&D expenditure
- Promote collaboration between R&D centers and educational institutions to transfer knowledge and promote innovation
- Creation of innovation labs modeled along the lines of Interuniversity Microelectronics Centre (IMEC) in Belgium, for collaboration with private companies and developing an ESDM ecosystem



S.No.	Intervention Period	Intervention	Stakeholder
1	Short-term	Training of trainer	MSDE, NCVET, Sector Skill Council, DGT, NSTI, AICTE, MOE
2	Short-term	Incentive to faculty	MSDE
3	Short-term	Entrepreneurship support	MSDE, SIDBI, NABARD, MEITY, NIES BUD
4	Short-term	Monitoring and evaluation	MSDE, MEITY
5	Short-term	Awareness and outreach	MSDE, NCVET, Sector Skill Council, DGT, NSTI, AICTE, NSDC, Training Providers
6	Mid-term	Industry-Academic collaboration	MSDE, MOE, MEITY
7	Mid-term	Continuous learning culture	MSDE, MOE, MEITY
8	Mid-term	Certification and accreditation	MSDE, NCVET, SSC, DGT, NSTI, AICTE, MOE
9	Mid-term	Government incentive (schemes)	MSDE, MOE, MEITY
10	Mid-term	Public-private partnership	MSDE, MOE, MEITY
11	Mid-term	International collaboration	MSDE, MOE, MEITY
12	Long-term	Revamp of educational curriculum	MSDE, NCVET, Sector Skill Council, DGT, NSTI, AICTE, MOE
13	Long-term	Need for demand driven skill development initiatives	MSDE, MEITY, MOE
14	Long-term	Research and development	MSDE, MEITY, MOE

Figure 10: Recommendation and stakeholder mapping

5.11 Public-private partnerships

- Encourage collaboration between the government, private sector, and non-profit organizations to fund and execute skill development programs
- Leverage private sector expertise to design industry-relevant training modules
- Apex bodies across sectors to work together for curriculum upgradation as well and cross utilization of infrastructure

5.12 Monitoring and evaluation

- Implement a robust system for monitoring the effectiveness of skill development initiatives
- Continuously assess the industry's changing needs and adjust training programs accordingly
- Harmonization across TVET, to ensure multiple pathways of entry and exit is accessed by all students which is line in NEP 2020 and addresses the National Credit Framework (NCF)

5.13 International collaboration

- Collaborate with international institutions and organizations to share best practices and leverage global expertise in skill development
- Explore opportunities for Indian professionals to gain international exposure

5.14 Awareness and outreach

- Launch public awareness campaigns to highlight the importance of skill development in the electronics sector
- Promote electronic sector careers among students and parents to encourage enrollment in relevant educational programs
- Provide students with career progression counselling



CONCLUSION



India's electronic sector has made remarkable progress, driven by government support, foreign investment, and a growing domestic market. Schemes like PLI which are cornerstone of boosting the domestic manufacturing sector, have led to not only increase in production but also has generated employment, fueled economic growth, and increased export in the country. In recent times, some of the major smartphone companies have shifted their supplier to India, which has resulted in top high-end phones being manufactured in India. The sector has the potential to play a pivotal role in India's economic development and job creation but addressing challenges and ensuring sustainability will be key to long term success. To address the shortcoming of the sector especially for that of skilled manpower, efforts must be converged across government, training providers, industry clusters and academia.



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The chamber with its presence in 14 states and 10 countries, provides a platform for networking and consensus building within and across sectors and is the first port of call for Indian industry, policy makers and the international business community.

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