



## Unleashing the Potential of Electronics Manufacturing

This editorial is based on [“Electronic manufacturing in India needs rapid charging”](#) which was published in Financial Express on 28/06/2023. It talks about the scope of India becoming self-reliant and export-oriented in the electronics manufacturing sector and the challenges associated.

**For Prelims:** PLI Schemes for [Large Scale Electronics Manufacturing](#) and [IT Hardware, Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors \(SPECs\)](#), [Modified Electronics Manufacturing Clusters Scheme \(EMC 2.0\)](#), [India’s Semiconductor Mission](#), [Make in India](#)

**For Mains:** India as an electronics manufacturing hub - scope and challenges, Make in India programme and electronics sector.

India has mobilised itself to become **one of the fastest-developing economies in the world**. The [electronic manufacturing](#) narrative, in this context, is of particular significance. Companies over the world are beginning to look at the **Indian market as their next electronics manufacturing destination** to cater to the burgeoning domestic demand for electronic goods.

Realising the sector’s potential for growth and its capability to provide large-scale employment, the **Indian government is enthusiastically pursuing the ‘Make in India’ program** as a core policy initiative to support and speed up the country’s manufacturing sector including electronics.

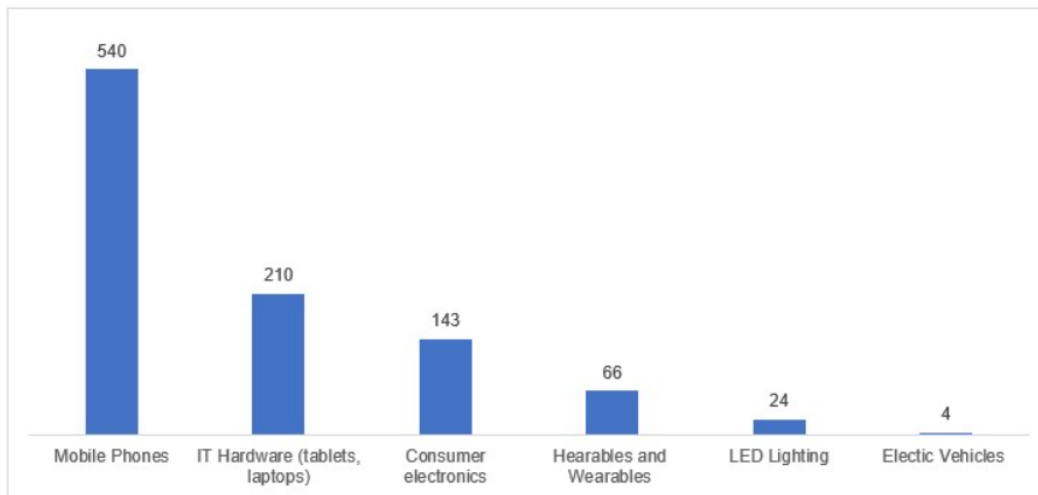
### What is the Current Scenario of Electronics Production in India?

- **Opening Opportunities for India:**
  - **Electronics is the largest manufactured and traded category globally**, valued at over USD 2 trillion. Out of this, **China supplies almost over 50%**.
    - However, the **rising wage cost in China is pushing buyers to diversify and de-risk their supply chains**, presenting a unique opportunity for India.
  - **India is one of the leading contenders for alternate solutions** for global electronics companies and the electronics sector has the potential to become one of the top exports of India in the next 3-5 years.
  - **India is expected to become a USD 1 Trillion digital economy by FY26.**
- **India’s Production Scenario:** The electronics manufacturing industry grew from USD 37.1 billion in 2015-16 to **USD 67.3 billion in 2020-21** and **India targets to make it USD 300 billion by 2026 (domestic production)**.
  - As per **MeitY’s Vision Document 2.0** - India can reach this target provided, specific product segments with high potential for scale are shortlisted and catered to by way of incentives and policy measures.
  - **Exports of USD 120-140 billion** are critical to reach the USD 300 billion mark for electronics manufacturing.

### ▪ Schemes for Electronics Manufacturing:

- In order to position India as a global hub for **Electronics System Design and Manufacturing (ESDM)**, following schemes have been introduced:
  - The **PLI Schemes** for (a) **Large Scale Electronics Manufacturing** and (b) **IT Hardware**
  - **Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECs)** and
  - **Modified Electronics Manufacturing Clusters Scheme (EMC 2.0)**
- Additionally, **India's Semiconductor Mission** with an incentive outlay of ~USD 10 bn was launched with the vision to develop a sustainable semiconductor and display ecosystem in the country.
- **100% FDI is allowed** for electronics under the automatic route, however, **in the case of defence electronics, FDI up to 49% is allowed** through automatic route (beyond 49% govt approval is required).

// Global market share of key product segments in 2020-21 (US\$ billion)



## What are the Challenges in Making India an Electronics Hub?

### ▪ Duties as a Double-Edged Sword:

- **High import duties and strict localisation norms** are often imposed to promote local manufacturing. While they do succeed to an extent in ensuring local manufacturing, they also **negatively impact a country's global competitiveness**.
  - This is **particularly true in electronics where supply chains are globally intertwined**.
- Countries like **Vietnam and China have more favourable subsidy structures** than India does **in areas like machinery** used for manufacturing, and research & development.

### ▪ Lack of Component Ecosystem:

- Another challenge is **India lacking a robust ecosystem of companies locally manufacturing** components required for electronic products.
- In the absence of a full-fledged component ecosystem in India, **these components are required to be imported**, resulting in increased costs and lead time for the manufacturers.
  - An active policy support to promote local manufacturing, including through domestic players, appears to be missing at present.

### ▪ Skill Development:

- There is a **shortage of skilled labour in the electronics manufacturing sector**. To become a global hub, India needs to **invest in developing a highly skilled workforce** with expertise in areas such as electronics engineering, research and development, and advanced manufacturing technologies.

### ▪ Regulatory Environment:

- The regulatory framework and bureaucratic procedures in India can be **complex and time-consuming**.
- Streamlining regulations and reducing **bureaucratic red tape** would enhance the ease of doing business, attract investments, and foster a conducive environment for electronics manufacturing.
- **Environmental Sustainability:**
  - Electronics manufacturing often generates **electronic waste**, which poses environmental challenges.
  - **Absence of effective implementation of sustainable practices** like e-waste management and promotion of environmentally friendly manufacturing processes can do more harm to the environment than the intended good.

## What Steps can be Taken to Improve India's Electronics Sector?

- **Increasing Scalability:**
  - Electronics manufacturing prospers in large clusters which provide requisite economies of scale. However, India hasn't envisaged its manufacturing clusters at requisite scale.
    - **India currently has almost 400 SEZs** across the country to drive exports, which even if put together, account for half the exports when compared to the **Shenzen SEZ in China**.
  - **India must double down on creating mega, global scale electronics clusters** in a couple of locations across the country. **UP (Noida), Tamil Nadu, and Telangana are already emerging as front runners** and time has come to bet big to create electronics clusters of global scale.
- **Limiting High Exports Duty:**
  - In order to gain a fair share of the global electronics market, there needs to be a **complete overhaul in our thinking, especially for taxation**, labour laws and worker housing.
    - India is now **shifting from being an import-substitution electronics economy to an export-led economy**.
  - Complex duty structure with high and constantly changing rates serve as major barriers to making India an assembly hub for global OEMs and thus require a revisit.
- **Private-Government Collaboration:**
  - While India has been a leading manufacturer of mobile phones in the past few years, it has largely been in the low technology category. Now, Indian manufacturers can work towards becoming a part of the global value chains.
    - **Public-private collaboration, supportive policies and legal framework are key to driving this growth**.
  - The government's aim to create a **10 million-strong skilled IT workforce in the next three years**, roll out the semiconductor design-linked incentive policy, etc. - all these initiatives work towards building a robust electronic manufacturing ecosystem.
- **Looking for Cooperation amid Tensions:**
  - Some of the biggest electronics companies globally today are Chinese in addition, thousands of Chinese electronics components suppliers.
    - **Difficulties in cooperation arising due to border tensions** between India and China severely limits India's ability to attract large scale manufacturing investment.
  - In this context, the **China-Taiwan example can be emulated where**, despite being on the verge of war, over **4,000 Taiwanese companies operate in China** including Foxconn, one of the biggest employers in China.
    - **Finding a way to do business with China in India's enlightened self-interest** despite political tensions will be critical for success in electronics manufacturing.
- **Increasing Flexibility:**
  - In 2008, Vietnam removed local content requirements on its FDI which encouraged Samsung to move its manufacturing base from South Korea to Vietnam, and **today, 60% of all Samsung smartphones are manufactured in Vietnam**.
    - Other tech giants like LG, Apple, Nintendo, and several others have also transferred large parts of manufacturing to Vietnam.
    - As a result, Vietnam has climbed from the **47<sup>th</sup> position in global electronics exports ranking in 2001 to the 7<sup>th</sup> position in 2021**.

- **Similar incentives regarding flexibility should be provided to Indian manufacturers** to utilise the workforce in line with practices in competing countries.

## Conclusion

Emerging technologies such as [AI](#), [ML](#), [IoT](#), [Augmented Reality \(AR\)](#), [Virtual Reality \(VR\)](#) and Robotics are transforming the industry while driving up demand for new electronics products. India is already a recognized global player in software development and by strengthening its hardware manufacturing capabilities, **India has the potential to emerge as a leading force in the electronics space as well.**

It is important to note that the **vision of a 'Self-Reliant India'** will only be realised if various **sectors in manufacturing scale up their capabilities and technology adoption.** The need of the hour is to **build an environment that fosters innovation, protects intellectual property, focuses on skill development,** and builds infrastructure that supports the ecosystem.

### **Drishti Mains Question:**

Discuss India's scope and major challenges in becoming a global manufacturing hub in Electronics System Design and Manufacturing (ESDM) sector.

## UPSC Civil Services Examination, Previous Year Questions (PYQs)

### **Prelims:**

**Q. 'R2 Code of Practices' constitutes a tool available for promoting the adoption of (2020)**

- (a)** environmentally responsible practices in electronics recycling industry
- (b)** ecological management of Wetlands of International Importance under the Ramsar Convention
- (c)** sustainable practices in the cultivation of agricultural crops in degraded lands
- (d)** 'Environmental Impact Assessment' in the exploitation of natural resources

**Ans: (a)**